

## Horizon 2020

### Call: H2020-SC5-2016-2017 (Greening the Economy)

#### SECOND STAGE

### Topic: SC5-01-2016-2017

### Type of action: IA (Innovation action)

### Proposal number: 730253-2

### Proposal acronym: VISCA

Deadline Id: H2020-SC5-2016-TwoStage

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#### *How to fill in the forms*

The administrative forms must be filled in for each proposal using the templates available in the submission system. Some data fields in the administrative forms are pre-filled based on the previous steps in the submission wizard.



Proposal ID **730253-2**

Acronym **VISCA**

## 1 - General information

Topic SC5-01-2016-2017

Call Identifier H2020-SC5-2016-2017

Type of Action IA

Deadline Id H2020-SC5-2016-TwoStage

Acronym VISCA

Proposal title\* Vineyards' Integrated Smart Climate Application

*Note that for technical reasons, the following characters are not accepted in the Proposal Title and will be removed: < > " &*

Duration in months 36

Fixed keyword 1 Climatology and climate change

Add

Free keywords Climate service, Decision Support Service, Wine Industry, Crop Planning, Phenology, Irrigation, seasonal forecasting, decadal projections



Proposal ID **730253-2**

Acronym **VISCA**

## Abstract

*Internationalization of the markets has allowed for the globalization of agriculture, benefiting - directly or indirectly – relevant countries or even entire regions like the EU, who is the first trader in agriculture products of the world. Among the different varieties of agriculture species, the wine-grapes are specially threatened by climate change, since subtle differences in microclimate impacts directly through over-ripening, rising acidity levels, greater vulnerability to pests and diseases, etc., resulting in changes in wine quality and properties. The wine industry needs therefore to tackle adaptation measures, and long term adaptation planning will provide producers with a comparative advantage over competitors.*

*VISCA is a Climate Service (CS) and Decision Support System (DSS) that integrates climate, agricultural and end-users' specifications in order to design medium- and long-term adaptation strategies to climate change. VISCA will be validated by real demonstration with end-users on three demo sites belonging to three wine stakeholders from Spain, Italy and Portugal, which are included as partners in the consortium (Codorniu, Mastroberardino and Symington).*

*The main objective of VISCA is making South-European wine industries resilient to climate changes, while minimizing costs and risks through an improvement of the production management (quality and quantity of final product). This objective will be achieved with the integration of climatic data, phenological, irrigation models, and end-users' requirements into a Decision Support System (DSS) co-designed with wine producers from Spain, Italy and Portugal. VISCA will supply well-founded decisions of specific aspects of crop planning (e.g., budburst, harvesting, defoliation, minimum water needs), and suggest preventive actions against extreme events and long-term suitability maps.*

Remaining characters

120

Has this proposal (or a very similar one) been submitted in the past 2 years in response to a call for proposals under the 7th Framework Programme, Horizon 2020 or any other EU programme(s)?

☐ Yes ☒ No



Proposal ID **730253-2**

Acronym **VISCA**

## Declarations

1) The coordinator declares to have the explicit consent of all applicants on their participation and on the content of this proposal.	<input checked="" type="checkbox"/>
2) The information contained in this proposal is correct and complete.	<input checked="" type="checkbox"/>
3) This proposal complies with ethical principles (including the highest standards of research integrity — as set out, for instance, in the <a href="#">European Code of Conduct for Research Integrity</a> — and including, in particular, avoiding fabrication, falsification, plagiarism or other research misconduct).	<input checked="" type="checkbox"/>
4) The coordinator confirms:	
- to have carried out the self-check of the financial capacity of the organisation on <a href="http://ec.europa.eu/research/participants/portal/desktop/en/organisations/lfv.html">http://ec.europa.eu/research/participants/portal/desktop/en/organisations/lfv.html</a> or to be covered by a financial viability check in an EU project for the last closed financial year. Where the result was “weak” or “insufficient”, the coordinator confirms being aware of the measures that may be imposed in accordance with the H2020 Grants Manual (Chapter on Financial capacity check); or	<input checked="" type="radio"/>
- is exempt from the financial capacity check being a public body including international organisations, higher or secondary education establishment or a legal entity, whose viability is guaranteed by a Member State or associated country, as defined in the H2020 Grants Manual (Chapter on Financial capacity check); or	<input type="radio"/>
- as sole participant in the proposal is exempt from the financial capacity check.	<input type="radio"/>
5) The coordinator hereby declares that each applicant has confirmed:	
- they are fully eligible in accordance with the criteria set out in the specific call for proposals; and	<input checked="" type="checkbox"/>
- they have the financial and operational capacity to carry out the proposed action.	<input checked="" type="checkbox"/>
The coordinator is only responsible for the correctness of the information relating to his/her own organisation. Each applicant remains responsible for the correctness of the information related to him/her and declared above. Where the proposal to be retained for EU funding, the coordinator and each beneficiary applicant will be required to present a formal declaration in this respect.	

According to Article 131 of the Financial Regulation of 25 October 2012 on the financial rules applicable to the general budget of the Union (Official Journal L 298 of 26.10.2012, p. 1) and Article 145 of its Rules of Application (Official Journal L 362, 31.12.2012, p.1) applicants found guilty of misrepresentation may be subject to administrative and financial penalties under certain conditions.

### Personal data protection

The assessment of your grant application will involve the collection and processing of personal data (such as your name, address and CV), which will be performed pursuant to Regulation (EC) No 45/2001 on the protection of individuals with regard to the processing of personal data by the Community institutions and bodies and on the free movement of such data. Unless indicated otherwise, your replies to the questions in this form and any personal data requested are required to assess your grant application in accordance with the specifications of the call for proposals and will be processed solely for that purpose. Details concerning the purposes and means of the processing of your personal data as well as information on how to exercise your rights are available in the [privacy statement](#). Applicants may lodge a complaint about the processing of their personal data with the European Data Protection Supervisor at any time.

Your personal data may be registered in the Early Detection and Exclusion system of the European Commission (EDES), the new system established by the Commission to reinforce the protection of the Union's financial interests and to ensure sound financial management, in accordance with the provisions of articles 105a and 108 of the revised EU Financial Regulation (FR) (Regulation (EU, EURATOM) 2015/1929 of the European Parliament and of the Council of 28 October 2015 amending Regulation (EU, EURATOM) No 966/2012) and articles 143 - 144 of the corresponding Rules of Application (RAP) (COMMISSION DELEGATED REGULATION (EU) 2015/2462 of 30 October 2015 amending Delegated Regulation (EU) No 1268/2012) for more information see the [Privacy statement for the EDES Database](#).





Proposal ID **730253-2**

Acronym **VISCA**

## List of participants

#	Participant Legal Name	Country
1	METEOSIM SL	Spain
2	BARCELONA SUPERCOMPUTING CENTER - CENTRO NACIONAL DE SUPERCOMPUTACION	Spain
3	CODORNIU, S. A.	Spain
4	INSTITUT DE RECERCA I TECNOLOGIA AGROALIMENTARIES	Spain
5	ISTITUTO SUPERIORE MARIO BOELLA SULLE TECNOLOGIE DELL'INFORMAZIONE E DELLE TELECOMUNICAZIONI ASSOCIAZIONE	Italy
6	UNIVERSITA DEGLI STUDI DI NAPOLI FEDERICO II.	Italy
7	Mastroberardino spa	Italy
8	SYMINGTON - VINHOS SA	Portugal
9	UNIVERSIDADE DO PORTO	Portugal
10	UNITE TECHNIQUE DU SEMIDE GEIE	France
11	ALPHA CONSULTANTS (UK) LTD	United Kingdom



Proposal ID **730253-2**

Acronym **VISCA**

Short name **MET**

## 2 - Administrative data of participating organisations

### PIC

994783404

### Legal name

METEOSIM SL

Short name: *MET*

### Address of the organisation

Street CALLE BALDIRI REIXAC 10-12 PARC CI ENTI

Town BARCELONA

Postcode 08028

Country Spain

Webpage www.meteosim.com

### Legal Status of your organisation

#### Research and Innovation legal statuses

Public body ..... no

Legal person ..... yes

Non-profit ..... no

International organisation ..... no

International organisation of European interest ..... no

Secondary or Higher education establishment ..... no

Research organisation ..... no

#### Enterprise Data

SME self-declared status ..... unknown

SME self-assessment ..... unknown

SME validation sme ..... unknown

Based on the above details of the Beneficiary Registry the organisation is an SME (small- and medium-sized enterprise) for the call.

NACE Code: 93 - Sports activities and amusement and recreation activities



Proposal ID **730253-2**

Acronym **VISCA**

Short name **MET**

### Department(s) carrying out the proposed work

#### Department 1

Department name RDi Department

☐ not applicable

☒ Same as organisation address

Street CALLE BALDIRI REIXAC 10-12 PARC CI ENTIF

Town BARCELONA

Postcode 08028

Country Spain

### Dependencies with other proposal participants

Character of dependence	Participant	
-------------------------	-------------	--



Proposal ID **730253-2**

Acronym **VISCA**

Short name **MET**

### Person in charge of the proposal

The name and e-mail of contact persons are read-only in the administrative form, only additional details can be edited here. To give access rights and basic contact details of contact persons, please go back to Step 4 of the submission wizard and save the changes.

Title

Dr.

Sex

☐ Male

☒ Female

First name **Maria**

Last name **NAVARRO ABELLAN**

E-Mail **mnavarro@meteosim.com**

Position in org.

Manager

Department

RD*i*

☐ Same as organisation

☒ Same as organisation address

Street

CALLE BALDIRI REIXAC 10-12 PARC CI ENTIFIC DE BARCELONA

Town

BARCELONA

Post code

08028

Country

Spain

Website

www.meteosim.com

Phone 1

+34 934499245

Phone 2

+34 934490010

Fax

+XXX XXXXXXXXX

### Other contact persons

First Name	Last Name	E-mail	Phone
Anna	Riverola	ariverola@meteosim.com	934499245



Proposal ID **730253-2**

Acronym **VISCA**

Short name **BSC**

**PIC**

999655520

**Legal name**

BARCELONA SUPERCOMPUTING CENTER - CENTRO NACIONAL DE SUPERCOMPUTACION

*Short name: BSC*

*Address of the organisation*

Street Calle Jordi Girona 31

Town BARCELONA

Postcode 08034

Country Spain

Webpage www.bsc.es

*Legal Status of your organisation*

**Research and Innovation legal statuses**

Public body ..... yes

Legal person ..... yes

Non-profit ..... yes

International organisation ..... no

International organisation of European interest ..... no

Secondary or Higher education establishment ..... no

Research organisation ..... yes

**Enterprise Data**

SME self-declared status ..... unknown

SME self-assessment ..... unknown

SME validation sme ..... unknown

**Based on the above details of the Beneficiary Registry the organisation is not an SME (small- and medium-sized enterprise) for the call.**

NACE Code: 72 - Scientific research and development



Proposal ID **730253-2**

Acronym **VISCA**

Short name **BSC**

### Department(s) carrying out the proposed work

#### Department 1

Department name

☐ not applicable

☐ Same as organisation address

Street

Town

Postcode

Country

### Dependencies with other proposal participants

Character of dependence	Participant	
-------------------------	-------------	--



Proposal ID **730253-2**

Acronym **VISCA**

Short name **BSC**

### Person in charge of the proposal

The name and e-mail of contact persons are read-only in the administrative form, only additional details can be edited here. To give access rights and basic contact details of contact persons, please go back to Step 4 of the submission wizard and save the changes.

Title

Dr.

Sex

☒ Male

☐ Female

First name **Albert**

Last name **Soret**

E-Mail **albert.soret@bsc.es**

Position in org.

Group Leader

Department

Earth Science

☐ Same as organisation

☐ Same as organisation address

Street

29th Jordi Girona Street

Town

Barcelona

Post code

08034

Country

Spain

Website

www.bsc.es

Phone 1

+34934134076

Phone 2

+XXX XXXXXXXXXX

Fax

+XXX XXXXXXXXXX

### Other contact persons

First Name	Last Name	E-mail	Phone
Marina	Azor	marina.azor@bsc.es	+34934134082
Mar	Rodriguez	mar.rodriguez@bsc.es	+34934137566
Dorota	Chmielewska	dorota.chmielewska@bsc.es	



Proposal ID **730253-2**

Acronym

**VISCA**

Short name **COD**

**PIC**

934737494

**Legal name**

CODORNIU, S. A.

Short name: **COD**

*Address of the organisation*

Street Casa Codorníu

Town Sant Sadurní d'Anoia

Postcode 08770

Country Spain

Webpage www.codorniu.com

*Legal Status of your organisation*

**Research and Innovation legal statuses**

Public body ..... unknown

Legal person ..... yes

Non-profit ..... unknown

International organisation ..... unknown

International organisation of European interest ..... unknown

Secondary or Higher education establishment ..... unknown

Research organisation ..... unknown

**Enterprise Data**

SME self-declared status ..... unknown

SME self-assessment ..... unknown

SME validation sme ..... unknown

Based on the above details of the Beneficiary Registry the organisation is not an SME (small- and medium-sized enterprise) for the call.

NACE Code: -





Proposal ID **730253-2**

Acronym **VISCA**

Short name **COD**

### Department(s) carrying out the proposed work

#### Department 1

Department name

Technical

☐ not applicable

☒ Same as organisation address

Street

Casa Codorníu

Town

Sant Sadurní d'Anoia

Postcode

08770

Country

Spain

### Dependencies with other proposal participants

Character of dependence	Participant	
-------------------------	-------------	--



Proposal ID **730253-2**

Acronym **VISCA**

Short name **COD**

### Person in charge of the proposal

The name and e-mail of contact persons are read-only in the administrative form, only additional details can be edited here. To give access rights and basic contact details of contact persons, please go back to Step 4 of the submission wizard and save the changes.

Title

Mr.

Sex

☒ Male

☐ Female

First name **Joan**

Last name **Esteve**

E-Mail **j.esteve@codorniu.com**

Position in org.

Technical director of viticulture

Department

Viticulture

☐ Same as organisation

☒ Same as organisation address

Street

Casa Codorníu

Town

Sant Sadurní d'Anoia

Post code

08770

Country

Spain

Website

www.codorniu.com

Phone 1

610486975

Phone 2

+XXX XXXXXXXXXX

Fax

+XXX XXXXXXXXXX

### Other contact persons

First Name	Last Name	E-mail	Phone
Gema	Bruna	g.bruna@odorniu.com	610486272



Proposal ID **730253-2**

Acronym **VISCA**

Short name **IRTA**

**PIC**

999506819

**Legal name**

INSTITUT DE RECERCA I TECNOLOGIA AGROALIMENTARIES

*Short name: IRTA*

*Address of the organisation*

Street CTRA C-59 KM 12 TORRE MARIMON

Town CALDES DE MONTBUI BARCELONA

Postcode 08140

Country Spain

Webpage www.irta.es

*Legal Status of your organisation*

**Research and Innovation legal statuses**

Public body ..... yes

Legal person ..... yes

Non-profit ..... yes

International organisation ..... no

International organisation of European interest ..... no

Secondary or Higher education establishment ..... no

Research organisation ..... yes

**Enterprise Data**

SME self-declared status ..... unknown

SME self-assessment ..... unknown

SME validation sme ..... unknown

**Based on the above details of the Beneficiary Registry the organisation is not an SME (small- and medium-sized enterprise) for the call.**

NACE Code: -



Proposal ID **730253-2**

Acronym **VISCA**

Short name **IRTA**

### Department(s) carrying out the proposed work

#### Department 1

Department name

☐ not applicable

☐ Same as organisation address

Street

Town

Postcode

Country

### Dependencies with other proposal participants

Character of dependence	Participant	
-------------------------	-------------	--



Proposal ID **730253-2**

Acronym **VISCA**

Short name **IRTA**

### Person in charge of the proposal

The name and e-mail of contact persons are read-only in the administrative form, only additional details can be edited here. To give access rights and basic contact details of contact persons, please go back to Step 4 of the submission wizard and save the changes.

Title

Dr.

Sex

☒ Male

☐ Female

First name **Joan**

Last name **Girona**

E-Mail **joan.girona@irta.es**

Position in org.

Head of the department efficient use of water

Department

Please indicate the department of the Contact Point above in the organisation

☐ Same as organisation

☒ Same as organisation address

Street

CTRA C-59 KM 12 TORRE MARIMON

Town

CALDES DE MONTBUI BARCELONA

Post code

08140

Country

Spain

Website

Phone 1

+34 93 467 40 40

Phone 2

+XXX XXXXXXXXXX

Fax

+34 93 467 40 42

### Other contact persons

First Name	Last Name	E-mail	Phone
Sergi	Costa	sergi.costa@irta.cat	972630052
Rodrigo	de Oliveira	rodrigo.oliveira@irta.cat	972630052
Jordi	Marsal	jordi.marsal@irta.es	



Proposal ID **730253-2**

Acronym **VISCA**

Short name **ISMB**

**PIC**

999599357

**Legal name**

ISTITUTO SUPERIORE MARIO BOELLA SULLE TECNOLOGIE DELL'INFORMAZIONE E DELLE TELECOMUNICAZIONI AS

*Short name: ISMB*

*Address of the organisation*

Street VIA PIER CARLO BOGGIO 61

Town TORINO

Postcode 10138

Country Italy

Webpage www.ismb.it

*Legal Status of your organisation*

**Research and Innovation legal statuses**

Public body ..... no

Legal person ..... yes

Non-profit ..... yes

International organisation ..... no

International organisation of European interest ..... no

Secondary or Higher education establishment ..... no

Research organisation ..... yes

**Enterprise Data**

SME self-declared status ..... 2010 - no

SME self-assessment ..... unknown

SME validation sme ..... unknown

**Based on the above details of the Beneficiary Registry the organisation is not an SME (small- and medium-sized enterprise) for the call.**

NACE Code: 721 - Research and experimental development on natural sciences and engineering



Proposal ID **730253-2**

Acronym **VISCA**

Short name **ISMB**

### Department(s) carrying out the proposed work

#### Department 1

Department name

☐ not applicable

☒ Same as organisation address

Street

Town

Postcode

Country

### Dependencies with other proposal participants

Character of dependence	Participant	
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Proposal ID **730253-2**

Acronym **VISCA**

Short name **ISMB**

### Person in charge of the proposal

The name and e-mail of contact persons are read-only in the administrative form, only additional details can be edited here. To give access rights and basic contact details of contact persons, please go back to Step 4 of the submission wizard and save the changes.

Title

Mr.

Sex

☒ Male

☐ Female

First name **Fabrizio**

Last name **Dominici**

E-Mail **dominici@ismb.it**

Position in org.

Head of Department

Department

Mobile Solutions

☐ Same as organisation

☒ Same as organisation address

Street

VIA PIER CARLO BOGGIO 61

Town

TORINO

Post code

10138

Country

Italy

Website

www.ismb.it

Phone 1

+393316557125

Phone 2

+390112276417

Fax

+390112276299

### Other contact persons

First Name	Last Name	E-mail	Phone
Claudio	Rossi	rossi.claudio.82@gmail.com	+390112276430
Silvia	Gilli	gilli@ismb.it	+390112276212





Proposal ID **730253-2**

Acronym **VISCA**

Short name **NAP**

**PIC** 999976590 **Legal name** UNIVERSITA DEGLI STUDI DI NAPOLI FEDERICO II.

*Short name: NAP*

*Address of the organisation*

Street Corso Umberto I 40

Town NAPOLI

Postcode 80138

Country Italy

Webpage www.unina.it

*Legal Status of your organisation*

**Research and Innovation legal statuses**

Public body ..... yes

Legal person ..... yes

Non-profit ..... yes

International organisation ..... unknown

International organisation of European interest ..... unknown

Secondary or Higher education establishment ..... yes

Research organisation ..... yes

**Enterprise Data**

SME self-declared status ..... unknown

SME self-assessment ..... unknown

SME validation sme ..... unknown

**Based on the above details of the Beneficiary Registry the organisation is not an SME (small- and medium-sized enterprise) for the call.**

NACE Code: 853 - Higher education



Proposal ID **730253-2**

Acronym **VISCA**

Short name **NAP**

### Department(s) carrying out the proposed work

#### Department 1

Department name Department of Agricultural Sciences

☐ not applicable

☒ Same as organisation address

Street Corso Umberto I 40

Town NAPOLI

Postcode 80138

Country Italy

### Dependencies with other proposal participants

Character of dependence	Participant	
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Proposal ID **730253-2**

Acronym **VISCA**

Short name **NAP**

### Person in charge of the proposal

The name and e-mail of contact persons are read-only in the administrative form, only additional details can be edited here. To give access rights and basic contact details of contact persons, please go back to Step 4 of the submission wizard and save the changes.

Title

Dr.

Sex

☒ Male

☐ Female

First name **Boris**

Last name **Basile**

E-Mail **boris.basile@unina.it**

Position in org.

Associate Professor

Department

Department of Agricultural Sciences

☐ Same as organisation

☒ Same as organisation address

Street

Corso Umberto I 40

Town

NAPOLI

Post code

80138

Country

Italy

Website

<http://www.dipartimentodiagraria.unina.it/>

Phone 1

+393477572567

Phone 2

+XXX XXXXXXXXX

Fax

+XXX XXXXXXXXX



Proposal ID **730253-2**

Acronym **VISCA**

Short name **MBD**

**PIC**

920262669

**Legal name**

Mastroberardino spa

*Short name: MBD*

*Address of the organisation*

Street Via Manfredi n. 75/81

Town Atripalda (AV)

Postcode 83042

Country Italy

Webpage www.mastroberardino.com

*Legal Status of your organisation*

**Research and Innovation legal statuses**

Public body ..... unknown

Legal person ..... yes

Non-profit ..... unknown

International organisation ..... unknown

International organisation of European interest ..... unknown

Secondary or Higher education establishment ..... unknown

Research organisation ..... unknown

**Enterprise Data**

SME self-declared status ..... unknown

SME self-assessment ..... unknown

SME validation sme ..... unknown

**Based on the above details of the Beneficiary Registry the organisation is not an SME (small- and medium-sized enterprise) for the call.**

NACE Code: -



Proposal ID **730253-2**

Acronym **VISCA**

Short name **MBD**

### Department(s) carrying out the proposed work

#### Department 1

Department name Viticulture

☐ not applicable

☒ Same as organisation address

Street Via Manfredi n. 75/81

Town Atripalda (AV)

Postcode 83042

Country Italy

### Dependencies with other proposal participants

Character of dependence	Participant	
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Proposal ID **730253-2**

Acronym **VISCA**

Short name **MBD**

### Person in charge of the proposal

The name and e-mail of contact persons are read-only in the administrative form, only additional details can be edited here. To give access rights and basic contact details of contact persons, please go back to Step 4 of the submission wizard and save the changes.

Title

Mr.

Sex

☒ Male

☐ Female

First name **Antonio**

Last name **Dente**

E-Mail **dente@mastroberardino.com**

Position in org.

Chief agronomist

Department

Mastroberardino spa

☒ Same as organisation

☒ Same as organisation address

Street

Via Manfredi n. 75/81

Town

Atripalda (AV)

Post code

83042

Country

Italy

Website

www.mastroberardino.com

Phone 1

348 1302793

Phone 2

+XXX XXXXXXXXX

Fax

+XXX XXXXXXXXX



Proposal ID **730253-2**

Acronym **VISCA**

Short name **SV**

**PIC**

920164505

**Legal name**

SYMINGTON - VINHOS SA

*Short name: SV*

*Address of the organisation*

Street TRAVESSA BARAO DE FORRESTER 86

Town VILA NOVA DE GAIA

Postcode 4400 034

Country Portugal

Webpage www.symington.com

*Legal Status of your organisation*

**Research and Innovation legal statuses**

Public body ..... no

Legal person ..... yes

Non-profit ..... no

International organisation ..... no

International organisation of European interest ..... no

Secondary or Higher education establishment ..... no

Research organisation ..... no

**Enterprise Data**

SME self-declared status ..... unknown

SME self-assessment ..... unknown

SME validation sme ..... unknown

Based on the above details of the Beneficiary Registry the organisation is not an SME (small- and medium-sized enterprise) for the call.

NACE Code: -



Proposal ID **730253-2**

Acronym **VISCA**

Short name **SV**

### Department(s) carrying out the proposed work

#### Department 1

Department name Viticulture

☐ not applicable

☒ Same as organisation address

Street TRAVESSA BARAO DE FORRESTER 86

Town VILA NOVA DE GAIA

Postcode 4400 034

Country Portugal

### Dependencies with other proposal participants

Character of dependence	Participant	
-------------------------	-------------	--





Proposal ID **730253-2**

Acronym **VISCA**

Short name **SV**

### Person in charge of the proposal

The name and e-mail of contact persons are read-only in the administrative form, only additional details can be edited here. To give access rights and basic contact details of contact persons, please go back to Step 4 of the submission wizard and save the changes.

Title

Mr.

Sex

☒ Male

☐ Female

First name **Fernando Alves**

Last name **Alves**

E-Mail **fernando.alves@symington.com**

Position in org.

R&D Viticulture

Department

R&D Viticulture

☐ Same as organisation

☒ Same as organisation address

Street

TRAVESSA BARAO DE FORRESTER 86

Town

VILA NOVA DE GAIA

Post code

4400 034

Country

Portugal

Website

symington@symington.com

Phone 1

+351 918 242 929

Phone 2

+351 254 730 366

Fax

+XXX XXXXXXXXX

### Other contact persons

First Name	Last Name	E-mail	Phone
Pedro	Leal	pedro.leal.costa@symington.com	+351918242929



Proposal ID **730253-2**

Acronym **VISCA**

Short name **UPORTO**

**PIC**

999894916

**Legal name**

UNIVERSIDADE DO PORTO

*Short name: UPORTO*

*Address of the organisation*

Street PRACA GOMES TEIXEIRA

Town PORTO

Postcode 4099 002

Country Portugal

Webpage <http://www.up.pt>

*Legal Status of your organisation*

**Research and Innovation legal statuses**

Public body ..... no

Legal person ..... yes

Non-profit ..... yes

International organisation ..... no

International organisation of European interest ..... no

Secondary or Higher education establishment ..... yes

Research organisation ..... yes

**Enterprise Data**

SME self-declared status ..... 2015 - no

SME self-assessment ..... 2015 - no

SME validation sme ..... unknown

**Based on the above details of the Beneficiary Registry the organisation is not an SME (small- and medium-sized enterprise) for the call.**

NACE Code: 853 - Higher education



Proposal ID **730253-2**

Acronym **VISCA**

Short name **UPORTO**

### Department(s) carrying out the proposed work

#### Department 1

Department name

☐ not applicable

☒ Same as organisation address

Street

Town

Postcode

Country

### Dependencies with other proposal participants

Character of dependence	Participant	
-------------------------	-------------	--



Proposal ID **730253-2**

Acronym **VISCA**

Short name **UPORTO**

### Person in charge of the proposal

The name and e-mail of contact persons are read-only in the administrative form, only additional details can be edited here. To give access rights and basic contact details of contact persons, please go back to Step 4 of the submission wizard and save the changes.

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Sex

☒ Male

☐ Female

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Last name **Lacerda de Queiroz**

E-Mail **jqueiroz@fc.up.pt**

Position in org.

Professor Auxiliar

Department

Departamento de Geociências, Ambiente e Ordenamento do Territóri

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☒ Same as organisation address

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PRACA GOMES TEIXEIRA

Town

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4099 002

Country

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Proposal ID **730253-2**

Acronym **VISCA**

Short name **SEM**

**PIC**

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**Legal name**

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*Short name: SEM*

*Address of the organisation*

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Town SOPHIA ANTIPOLIS

Postcode 06902

Country France

Webpage www.semide.net

*Legal Status of your organisation*

**Research and Innovation legal statuses**

Public body ..... no  
Non-profit ..... yes  
International organisation ..... no  
International organisation of European interest ..... no  
Secondary or Higher education establishment ..... no  
Research organisation ..... no

Legal person ..... yes

**Enterprise Data**

SME self-declared status ..... unknown  
SME self-assessment ..... unknown  
SME validation sme ..... unknown

**Based on the above details of the Beneficiary Registry the organisation is not an SME (small- and medium-sized enterprise) for the call.**

NACE Code: 93 - Sports activities and amusement and recreation activities



Proposal ID **730253-2**

Acronym **VISCA**

Short name **SEM**

### Department(s) carrying out the proposed work

#### Department 1

Department name

☐ not applicable

☒ Same as organisation address

Street

Town

Postcode

Country

### Dependencies with other proposal participants

Character of dependence	Participant	
-------------------------	-------------	--



Proposal ID **730253-2**

Acronym **VISCA**

Short name **SEM**

### Person in charge of the proposal

The name and e-mail of contact persons are read-only in the administrative form, only additional details can be edited here. To give access rights and basic contact details of contact persons, please go back to Step 4 of the submission wizard and save the changes.

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Mr.

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Department

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Proposal ID **730253-2**

Acronym **VISCA**

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*Short name: ALPH*

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Postcode EC1V 2NX

Country United Kingdom

Webpage www.alphacons.eu

*Legal Status of your organisation*

**Research and Innovation legal statuses**

Public body ..... no

Legal person ..... yes

Non-profit ..... no

International organisation ..... no

International organisation of European interest ..... no

Secondary or Higher education establishment ..... no

Research organisation ..... no

**Enterprise Data**

SME self-declared status ..... unknown

SME self-assessment ..... unknown

SME validation sme ..... unknown

**Based on the above details of the Beneficiary Registry the organisation is an SME (small- and medium-sized enterprise) for the call.**

NACE Code: 702 - Management consultancy activities





Proposal ID **730253-2**

Acronym **VISCA**

Short name **ALPH**

### Department(s) carrying out the proposed work

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Department name

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### Dependencies with other proposal participants

Character of dependence	Participant	
-------------------------	-------------	--



Proposal ID **730253-2**

Acronym **VISCA**

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### Person in charge of the proposal

The name and e-mail of contact persons are read-only in the administrative form, only additional details can be edited here. To give access rights and basic contact details of contact persons, please go back to Step 4 of the submission wizard and save the changes.

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☐ Female

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Last name **Spaltro**

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Olga	Dolgova	od@alphacons.eu	+393496732591



Proposal ID 730253-2      Acronym VISCA

3 - Budget for the proposal

No	Participant	Country	(A) Direct personnel costs/€  ?	(B) Other direct costs/€  ?	(C) Direct costs of sub- contracting/€  ?	(D) Direct costs of providing financial support to third parties/€  ?	(E) Costs of inkind contributions not used on the beneficiary's premises/€  ?	(F) Indirect Costs / € (=0.25(A+B-E))  ?	(G) Special unit costs covering direct & indirect costs / €  ?	(H) Total estimated eligible costs / € (=A+B+C+D +F+G) BENEFICIARY  ?	(I) Reimburse- ment rate (%)  BENEFICIARY  ?	(J) Max.EU Contribution / € (=H*I) BENEFICIARY  ?	(K) Costs of third parties linked to participant  THIRD PARTIES  ?	(L) Max.EU Contribution / €  THIRD PARTIES  ?	(M) Total Costs for BENEFICIARY & THIRD PARTIES (=H+K)  ?	(N) Max.EU Contribution / € BENEFICIARY & THIRD PARTIES (=J+L)  ?	(O) Requested EU Contribution / € BENEFICIARY & THIRD PARTIES  ?
1	Met	ES	282187	63400	8900	0	0	86396,75	0	440883,75	70	308618,63	0	0	440883,75	308618,63	308618,00
2	Bsc	ES	216000	20000	0	0	0	59000,00	0	295000,00	100	295000,00	0	0	295000,00	295000,00	295000,00
3	Cod	ES	156000	40500	27000	0	0	49125,00	0	272625,00	70	190837,50	0	0	272625,00	190837,50	190837,00
4	Irta	ES	305689	93634	5100	0	0	99830,75	0	504253,75	100	504253,75	0	0	504253,75	504253,75	504253,00
5	Ismb	IT	286200	35440	0	0	0	80410,00	0	402050,00	100	402050,00	0	0	402050,00	402050,00	402050,00
6	Nap	IT	172800	73500	5000	0	0	61575,00	0	312875,00	100	312875,00	0	0	312875,00	312875,00	291000,00
7	Mbd	IT	135600	38500	12000	0	0	43525,00	0	229625,00	70	160737,50	0	0	229625,00	160737,50	160737,00
8	Sv	PT	95000	20000	0	0	0	28750,00	0	143750,00	70	100625,00	0	0	143750,00	100625,00	100625,00
9	Uporto	PT	95500	6000	0	0	0	25375,00	0	126875,00	100	126875,00	0	0	126875,00	126875,00	126875,00
10	Sem	FR	149380	23740	13000	0	0	43280,00	0	229400,00	100	229400,00	0	0	229400,00	229400,00	229400,00
11	Alph	UK	200000	10000	0	0	0	52500,00	0	262500,00	70	183750,00	0	0	262500,00	183750,00	183750,00
	Total		2094356	424714	71000	0	0	629767,50	0	3219837,50		2815022,38	0,00	0,00	3219837,50	2815022,38	2793145,00

Proposal ID **730253-2**

Acronym **VISCA**

## 4 - Ethics issues table

<b>1. HUMAN EMBRYOS/FOETUSES</b>		Page
Does your research involve <a href="#">Human Embryonic Stem Cells (hESCs)</a> ?	<input type="radio"/> Yes <input checked="" type="radio"/> No	
Does your research involve the use of human embryos?	<input type="radio"/> Yes <input checked="" type="radio"/> No	
Does your research involve the use of human foetal tissues / cells?	<input type="radio"/> Yes <input checked="" type="radio"/> No	
<b>2. HUMANS</b>		Page
Does your research involve human participants?	<input type="radio"/> Yes <input checked="" type="radio"/> No	
Does your research involve physical interventions on the study participants?	<input type="radio"/> Yes <input checked="" type="radio"/> No	
<b>3. HUMAN CELLS / TISSUES</b>		Page
Does your research involve human cells or tissues (other than from Human Embryos/ Foetuses, i.e. section 1)?	<input type="radio"/> Yes <input checked="" type="radio"/> No	
<b>4. PERSONAL DATA</b>		Page
Does your research involve personal data collection and/or processing?	<input type="radio"/> Yes <input checked="" type="radio"/> No	
Does your research involve further processing of previously collected personal data (secondary use)?	<input type="radio"/> Yes <input checked="" type="radio"/> No	
<b>5. ANIMALS</b>		Page
Does your research involve animals?	<input type="radio"/> Yes <input checked="" type="radio"/> No	
<b>6. THIRD COUNTRIES</b>		Page
In case non-EU countries are involved, do the research related activities undertaken in these countries raise potential ethics issues?	<input type="radio"/> Yes <input checked="" type="radio"/> No	
Do you plan to use local resources (e.g. animal and/or human tissue samples, genetic material, live animals, human remains, materials of historical value, endangered fauna or flora samples, etc.)?	<input type="radio"/> Yes <input checked="" type="radio"/> No	
Do you plan to import any material - including personal data - from non-EU countries into the EU?	<input type="radio"/> Yes <input checked="" type="radio"/> No	
Do you plan to export any material - including personal data - from the EU to non-EU countries?	<input type="radio"/> Yes <input checked="" type="radio"/> No	
In case your research involves <a href="#">low and/or lower middle income countries</a> , are any benefits-sharing actions planned?	<input type="radio"/> Yes <input checked="" type="radio"/> No	
Could the situation in the country put the individuals taking part in the research at risk?	<input type="radio"/> Yes <input checked="" type="radio"/> No	



Proposal ID **730253-2**

Acronym **VISCA**

7. ENVIRONMENT & HEALTH and SAFETY		Page
Does your research involve the use of elements that may cause harm to the environment, to animals or plants?	<input type="radio"/> Yes <input checked="" type="radio"/> No	
Does your research deal with endangered fauna and/or flora and/or protected areas?	<input type="radio"/> Yes <input checked="" type="radio"/> No	
Does your research involve the use of elements that may cause harm to humans, including research staff?	<input type="radio"/> Yes <input checked="" type="radio"/> No	
8. DUAL USE		Page
Does your research involve dual-use items in the sense of Regulation 428/2009, or other items for which an authorisation is required?	<input type="radio"/> Yes <input checked="" type="radio"/> No	
9. EXCLUSIVE FOCUS ON CIVIL APPLICATIONS		Page
Could your research raise concerns regarding the exclusive focus on civil applications?	<input type="radio"/> Yes <input checked="" type="radio"/> No	
10. MISUSE		Page
Does your research have the potential for misuse of research results?	<input type="radio"/> Yes <input checked="" type="radio"/> No	
11. OTHER ETHICS ISSUES		Page
Are there any other ethics issues that should be taken into consideration? Please specify	<input type="radio"/> Yes <input checked="" type="radio"/> No	

I confirm that I have taken into account all ethics issues described above and that, if any ethics issues apply, I will complete the ethics self-assessment and attach the required documents. ☒

[How to Complete your Ethics Self-Assessment](#)



Proposal ID **730253-2**

Acronym **VISCA**

## 5 - Call specific questions

### Declarations on stage-2 changes

The full stage-2 proposal must be consistent with the short outline proposal submitted to the stage-1 - in particular with respect to the proposal characteristics addressing the concepts of excellence and impact.

Are there substantial differences compared to the stage-1 proposal?

☐ Yes

☒ No

### Data management activities

A new focus within Horizon 2020 is data management, for example through the use of [Data Management Plan \(DMP\)](#).

DMPs detail what data the project will generate, whether and how it will be exploited or made accessible for verification and re-use, and how it will be curated and preserved.

The use of a DMP is required for projects participating in the Open Research Data Pilot in the form of a deliverable in the first 6 months of the project (possible updates during the project).

Other projects are invited to submit a DMP if relevant for their planned research.

Are data management activities relevant for your proposed project?

☒ Yes

☐ No

A Data Management Plan will be delivered  
(Please note: a Data Management Plan (DMP) is required for projects participating in the Open Research Data Pilot in Horizon 2020, in the form of a deliverable in the first 6 months of the project. All other projects may deliver a DMP on a voluntary basis, if relevant for their research).



Data Management is part of a Work Package.



Data Management will be integrated in another way.



Please indicate how data management will be addressed in your project:

*Please indicate how data management will be addressed in your project.*

### Open Research Data Pilot in Horizon 2020



Proposal ID **730253-2**

Acronym **VISCA**

If selected, all applicants will participate in the [Pilot on Open Research Data in Horizon 2020](#) , which aims to improve and maximise access to and re-use of research data generated by actions.

Participants in the Pilot will be invited to formulate a [Data Management Plan \(DMP\)](#). DMPs detail what data the project will generate, whether and how it will be exploited or made accessible for verification and re-use, and how it will be curated and preserved.

Participating in the Pilot is flexible in the sense that it does not mean that all research data needs to be open. Rather, projects can define certain datasets to remain closed via a [Data Management Plan \(DMP\)](#).

Applicants also have the possibility to opt out of this Pilot. In this case, applicants must indicate a reason for this choice (see options below).

Please note that participation in this Pilot does not constitute part of the evaluation process. Proposals will not be penalised for opting out.

We wish to opt out of the Pilot on Open Research Data in Horizon 2020.

☐ Yes

☒ No



## Innovation action

Horizon 2020

Call: H2020-SC5-01-2016

Topic: Exploiting the added value of climate services

Type of action: IA

Proposal number: 730253-1

Proposal acronym: VISCA

# VISCA

## *Vineyards Integrated Smart Climate Application*

### List of participants

Participant No	Participant organisation name	Short Name	Country	Type
1 Coordinator	METEOSIM S.L.	MET	Spain	SME
2	Barcelona Supercomputing Center	BSC	Spain	Research Center
3	Codorniu S.A	COD	Spain	Industry
4	Institut de Recerca i Tecnologia Agroalimentàries	IRTA	Spain	Research Center
5	Istituto Superiore Mario Boella sulle Tecnologie dell'Informazione e delle Telecomunicazioni	ISMB	Italy	Research Center
6	Universita Degli Studi Di Napoli Federico II	UNAP	Italy	University
7	Mastroberardino spa	MAST	Italy	SME
8	Symington - Vinhos S.A.	SYM	Portugal	Industry
9	Universidade do Oporto	UPORTO	Portugal	Research Center
10	Unite Technique du Semide Geie	SEM	France	Non-profit org
11	Alpha Consultant	ALPHA	UK	SME



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# 1. Excellence

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Agriculture is a highly dependent sector on heat, sunlight and water, and therefore very sensitive to climate change. According to the current climate projections, weather events worldwide are very likely to become more extreme and frequent. In Europe, Southern countries will be frequently affected by heat waves, therefore making this region more vulnerable to droughts and wildfires, which will lead to economic, environmental, and even human losses. In addition, Mediterranean countries are prone to undergo hydrological resources' decrease, due to climate modification (lower precipitation rates) and demographic concentration changes. On the other hand, extreme precipitations will occur especially in the central and northern parts of Europe, giving rise to floods, resulting in a decrease of water quantity and quality due to the fact that hydrological systems will be altered, which may also decrease the water availability in the surrounding regions.

Agriculture happens to be the major land use of the earth, and this is expected to increase as population growth and diet changes may drive food needs up to 60 % by 2050. Therefore, agriculture should ensure food security in a world where 800 million people are currently chronically hunger<sup>1</sup>. Although agriculture has shown ability to adapt to changing conditions, is very likely that the above projections overpasses agriculture's adaptation limits. Even if policies and efforts to reduce emissions prove effective, some **climate change is inevitable**; therefore, **strategies and actions to adapt to climate change impacts are needed**.

Grape production is not different from the rest of agricultural activity, and they are likewise inherently interconnected to climate and weather, and, although grapes may grow worldwide, premium wine-grape production occurs in Mediterranean-like climate ranges. **Changes in climate and weather patterns are threatening premium wine-grapes** (i.e. decrease of the grape quality and quantity, undesirable changes in alcohol production, and acid and sugar concentrations), **directly affecting the European wine industry**. This is because grapevines are extremely sensitive to their surrounding environment, with seasonal variations in yield much higher than other common crops, such as cereals.<sup>2</sup>

Furthermore, the economic importance of agriculture for the local economy remains high in EU. Latest figures show that farming employs over 20 million people in the EU, many of which in areas where employment opportunities are limited. In particular, direct and indirect economic activity linked to winemaking and the commercialization of wine is the main economic activity of regions from South of Europe - The European Union is responsible of the 60% of world wine production, making it the world's biggest wine producer - . Proactive actions should be made since climate change, globalization, population growth and urbanization pose a serious threat to food productivity and production as well as to local economic growth.

With a view to making South European wine industry resilient to climate change, VISCA intends to deploy a climate service tool that will provide wine producers with well-founded information to be able to apply correctly adaptation strategies on specific grape varieties and locations, to achieve optimum production results (yield, quantity).

So far, adaptation strategies have been focused on shifting to the crop type most suited to the new climate conditions, or shifting the production to different location (higher latitudes); this implies a loss of centuries-accumulated knowledge on regional viticulture. VISCA's approach, on the other side, aims at using the latest advances in agricultural and climate models in order to move the vineyards' life cycle along the year, thus allowing it to adapt to the climate variations.

**VISCA is a Climate Service (CS) and Decision Support System (DSS) that integrates climate and agricultural modelling, and end-users' specifications, in order to design medium- and long-term adaptation strategies to climate change on vineyards. VISCA will be validated by real demonstration with end-users on three demo**

---

<sup>1</sup> FAO's Work on Climate Change. United Nations Climate Change Conference 2015.

<sup>2</sup> Chloupek, O., Hrstkova, P. & Schweigert, P. (2004). Yield and its stability, crop diversity, adaptability and response to climate change, weather and fertilisation over 75 years in the Czech Republic in comparison to some European countries. *Field Crops Research*, 85(2-3): 167-190.

sites belonging to wine stakeholders from Spain, Italy and Portugal, which are likewise partners in the consortium:

- **CODORNIU**<sup>3</sup> is the third most important wine producer in Spain<sup>4</sup> (2014), the oldest family business in Spain and one of the oldest in the world, with 450 years of history behind it. They will devote 3 ha to validate the CS-DSS, therefore it will be commercial-scale winemaking (not pilot-scale).
- **MASTROBERARDINO**<sup>5</sup> is an Italian wine producer known for championing the local varieties of Campania, and for several of its sub-regions gaining DOCG<sup>6</sup> status. It is most famous for its Aglianico-based wines made under the Taurasi DOCG as well. Mastroberardino family is living inside the socio-cultural wine world contest for two centuries, the first traces of its presence in Irpinia dating back in the half of the Eighteenth century. They will devote 1 ha to validate the CS-DSS.
- **SYMINGTON**<sup>7</sup> is the leading producer of premium quality Ports in the world, also the leading vineyard owner in the Douro Valley with 1006 hectares (2486 acres) of vineyards. The Symington family has been present in the Douro for five generations, since 1882. They will devote 1 ha to test the models used in the CS.

## 1.1 Objectives

**The main objective of VISCA is making European wine industries resilient to climate changes, minimizing costs and risks through an improvement of the production management (quality and quantity of final product), while evaluating its replicability to other high-added value agriculture sectors..**

This objective will be achieved through the integration of climatic data, phenological<sup>8</sup> and irrigation models, and end-users' requirements into a Climate Service (CS) - Decision Support System (DSS), co-designed with relevant South-European wine companies from Spain, Italy and Portugal, in order to provide with well-founded decisions of specific aspects of crop planning (i.e. budburst, harvesting, defoliation, pruning, minimum water needs, etc.), make warning against extreme events in short term, and produce a historical and future projection on the effects of climate change over phenological events. The realization of the aforementioned system is linked with the following specific objectives:

<b>Objective 1</b>	<b>Implementation of bias corrected seasonal forecast predictions (WP2)</b>
Statistical downscaling, understood as a form of bias adjustment, will be performed, which will be used whenever the users require local information. Model results will be evaluated against observational data sets, wherever available, and a number of reanalyses and observational gridded datasets.	
<b>Objective 2</b>	<b>Monthly production of real time medium/short-term (6 months) seasonal forecast predictions (WP2):</b>
Atmospheric indicators and large-scale indices that allow to build stories explaining the reasons behind what could happen in the next few months, and an assessment of the influence of short-term climate change, all from seasonal predictions.	
<b>Objective 3</b>	<b>Deployment of the operational weather forecast extreme events system (WP2)</b>
Development of operational and updated weather forecast system capable of supplying data/warnings of extreme events for the 3 demo-sites.	
<b>Objective 4</b>	<b>Production of long-term projections for the 3 different regions considered in the project (WP2)</b>

<sup>3</sup> <http://www.codorniu.com/en/>

<sup>4</sup> <http://ranking-empresas.eleconomista.es/sector-1102.html>

<sup>5</sup> <http://www.mastroberardino.com/en/the-history/>

<sup>6</sup> Denominazione di Origine Controllata e Garantita

<sup>7</sup> <https://www.symington.com/>

<sup>8</sup> <https://en.wikipedia.org/wiki/Phenology>

Decadal climatic projections to predict veraison and harvest dates for 2030, 2040 and 2050 for several varieties of grapes, allowing for the understanding of climate change on the vineyards' lifecycle, which implies doing long-term strategic crop planning.

<b>Objective 5</b>	<b>Implementation of calibrated Models for the prediction of plant phenology and yield (WP2)</b>
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Plant phenology (bud-break, veraison, end of the vegetative season, and harvest) will be predicted using several phenological models.

<b>Objective 6</b>	<b>Implementation of calibrated Irrigation Models for the prediction of annual water requirements (WP2)</b>
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Forecasting of annual irrigation requirements using VSIM developed by Lars Pierce from Williams and Ayars principles. These models will be fed with the climatic predictions to simulate vineyard performance.

<b>Objective 7</b>	<b>Implementation of a Climate Service and DSS (CS-DSS)</b>
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Implementation of a CS-DSS that integrates phenological and irrigation models, weather and climatic predictions, and end-user design requirements to provide information needed to optimize the crop planning (optimum harvest dates, optimum defoliation rates, yields, extreme weather events) (WP3)

<b>Objective 8</b>	<b>Development of a Cross-Platform Mobile Application</b>
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Design and development a cross-platform Mobile Application to be used by end-users to allow data visualization and in-field feedbacks to improve the accuracy of the models (WP3)

<b>Objective 9</b>	<b>Deployment of the CS-DSS over 3 demo sites (Spain, Italy and Portugal) (WP4)</b>
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The work will be performed on 3 pilot plots located in Spain, Portugal and Italy. These plots will be placed on commercial vineyards. Every pilot plot will have a size of 1 ha (minimum), and vines will be grown and trained according to the commercial practices of each concerned winery.

<b>Objective 10</b>	<b>Definition of an action plan to tackle barriers and opportunities derived from the full deployment of VISCA on the 3 demo areas (WP4)</b>
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During the entire project lifetime the main barriers to apply the tool at the demo sites will be gathered and compiled into a deliverable (task 4.4)

<b>Objective 11</b>	<b>Two demo Workshops (Spain and Italy) to (i) gather and collect end-users and stakeholders requirements, and (ii) disseminate and promote the advantages of VISCA in other sectors of agriculture (WP5)</b>
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Two workshops will be organised at the demonstration sites of Spain and Italy, with the objective to explore with potential buyers (problem holders)/users/legislators the requirements, values, risks and barriers and market opportunities.

<b>Objective 12</b>	<b>Evaluation of the replicability potential (technical and geographical) in other relevant sectors (olive oil, cereals, etc.) at international level (WP5)</b>
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The replicability of VISCA approach and tools to other sectors (VISCA market extensions) will be analysed in particular with contributions of the Project Advisory Board members, but also during VISCA workshops and during sustainable agriculture and food security events. The conclusions will be compiled in D5.4.

<b>Objective 13</b>	<b>Design of a business plan for a rapid market up-take of VISCA at international level (WP5)</b>
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Development of a business plan in task 5.5., identifying the key elements to prepare a realistic business plan for further solution uptake and commercialisation.

## 1.2. Relation to the work programme

***Responding to the climate change challenge requires climate-informed decision-making at all levels. The challenge is to minimize risks and costs and to seize opportunities.***

VISCA will provide accurate information to facilitate the implementation of relevant decisions to all levels of wine production business including farmers, downstream and upstream operators, producers, public authorities and policy makers to climate variations, and even to make mitigation plans for extreme climatic events. Given the wide time frame analyzed by VISCA, one clear benefit is that they ensure the appropriateness of decisions undertaken at all management levels, providing most appropriate medium-term response strategies (interesting for farmers and producers) with long-term management strategies (interesting for policy makers and long term crop planning for farmers), minimizing environmental and economic costs (improving quality and quantity of grape, reducing irrigation, reducing use of pesticides, etc.). The info supplied by VISCA can be used:

1. At crop-management level by farmers, producers and agriculture associations.
2. At strategical and logistic level by final producers (e.g. wine, oil, beer, etc.)
3. At policy level by policy makers (e.g. regional, national and international organizations dealing with sustainable agriculture/food security).

***Serving the demand of end-users and developing the business interface between suppliers and users of climate services.***

**VISCA's concept was born from the shared work of wine companies and research centers, due to the current need of wine producers in South-Europe to adopt weather and climate adaptation measures to plan for an uncertain future.** Even though the most spread tendency for wine producers so far has been to shift vineyards to higher latitude locations, there is a real need to develop adaptation strategies in order to keep economical sustainability in traditional regions. The three wine producers (end-users of the tool) involved in VISCA **aim to improve the quality and the quantity of produced grape, while minimizing the environmental and economic costs associated with the wine production** (e.g. minimizing costs by forecasting logistics involved in the production process by predicting amount of wine obtained that year).

Two different technics, already tested in 2 of the vineries, will be used to achieve the latter and by defining the limiting factors to be integrated in the climate service tool (i.e. maximum temperature, maximum alcohol/volume, variety of grapes, etc.), **VISCA will provide the needed information - dates for budburst, defoliation, minimum water needs and preparedness to extreme events - in order to make the best-informed decisions.**

***Development of climate services concepts that are ready to be used, or show potential for future deployment, demonstrating the added value of using climate information and services by end-users in their operational decision-making.***

VISCA will demonstrate the tool in 3 testing sites. **COD/IRTA and MAST/UNAP have already worked together<sup>9</sup> and tested models to predict grape quality up to two-three weeks before the harvest. Now, in VISCA they intend to add seasonal data and decadal projections to validate their empirical models and be able to take informed operational decisions.** This will be done through real demonstration of the tool (2 years). The climate service tool will provide each test site with the information needed to take informed operational decisions regarding critical information (e.g. the starting date of harvesting, of pruning, of defoliation, minimum water needs and preparedness to extreme events, ...) taking into consideration climatic data and phenological models specifics for their region and the varieties of grapes they have. The outcome in the fields where VISCA's tool will be applied will then be analyzed and compared to quality data of grapes from fields where the tool is not applied (see section 1.3.4 for methodology).

***Climate services need to be co-designed and co-developed through close collaboration of suppliers/purveyors and users. The action funded must respond to a formulated need for climate services by end-users that are served by climate service suppliers or business intermediaries; the demonstration project must be co-designed and co-developed with these end-users.***

<sup>9</sup> SYM/UPTO join the consortium to replicate experience and test the models in Portugal

**The end-users** belonging to VISCA consortium **specified the requirements and target limits to design VISCA.** These requirements will be integrated in the tool with the joint contribution of end users, climate service suppliers, research agricultural centers and software developers:

- Seasonal climatic forecast to run phenological models and predict grape ripening (IRTA-CropSyst crop model).
- Seasonal climatic forecast to estimate yield in dry land conditions (most of viniculture areas of Spain, Portugal and south of Italy). Based on this forecast, end-users know whether they need to buy more or less fruit from our winegrowers in order to match end-users' needs (strategical-logistical decisions).
- Seasonal forecasts are needed to know with enough accuracy prevailing temperature conditions during the post-veraison period and the occurrence of drought in the vineyard.
- Decadal climatic prediction to link with historical starting and ending veraison dates and the predicted dates for 2030, 2040 and 2050 for each variety.
- Forecasts/warnings of extreme events (heat waves, hail), to be able to apply prevention measures (e.g. water the vineyards 2 days before the heat wave start).

***Proposals therefore need to prove the maturity and sustainability of the concept, while also addressing the replicability and marketability of the proposed services.***

Traditional *know-how* and empirical models are often used in agriculture, which is a sector extremely dependent on meteorological conditions. In order to update the sector with advanced modelling techniques, VISCA will provide end-users with seasonal and decadal climatic data (open international climatic models), which, applied on phenological and irrigation models, will provide well-founded, informed decisions to be taken during the vineyards' agriculture cycles. **VISCA will be designed and implemented in order to be easily replicable to other agricultural sectors and in any other geographical area**, since the phenological models can be replaced according to the agriculture species whose production needs to be optimized, while keeping all other system components. The evaluation of the replicability potential in other relevant sectors taking into account technical and geographical variations will be carried out in WP5 (Objective 12), as well as the design of a business plan for a rapid market up-take of VISCA at international level (Objective 13). Furthermore, VISCA's Advisory Board counts on representatives from other agricultural sectors also sensitive to climate change like Olive oil (go to section 3.2 to see the members of the advisory board).

***The core of the action should be the demonstration of climate services in relation to issues where climate-related intelligence can support tangible decision-making processes in the public or private domain. The added value of the climate service provided has to be measurable and should be validated by the end-users collaborating in the demonstration projects.***

VISCA's structure has been designed to test, demonstrate and evaluate the climate service tool on three demonstration sites located in wine producers vineyards of 3 South European countries. The service supplied by VISCA will grant companies with a strategical business support to allow for the survival of their activity in the medium and long term. Using the appropriate models, VISCA's methodology can be replicable to other crops and applied worldwide. In parallel, VISCA will disseminate and communicate the project objectives and outcomes as globally as possible, focusing on an international market-uptake of the final product.

***The projects should communicate the added value of the services to other relevant end-user communities that must be specified in the proposal.***

In order to communicate the added value of the service to other relevant end-user communities, VISCA's Advisory Board counts on members belonging to the wine sector: OIV (International Wine Association), INNOVI (Catalan Wine Cluster), PTV, (Plataforma Tecnológica del Vino), Asso Enology; **the Olive Oil sector**: IOC (International Oil Council), AEMO (Spanish Olive Association), CITOLIVA (Olive Oil Technological Center), and **Agriculture** (specially Mediterranean/European): DELTAMED (Mediterranean Deltas Association), JRC (Joint Research Center), and climate: WMO (World Meteorological Organization), UNEP (United Nations Development Programme) (see **Table 10** for more information about these organizations).

VISCA will ensure that the project objectives, activities and outcomes reach the relevant target groups such as



irrigation and agricultural communities, farmers, wine makers, educational and training organizations and policy-makers in and beyond the demo site countries and prepare for the market uptake of VISCA's tool (see WP5). SEMIDE will also support networking with relevant initiatives, related to vineyard and agriculture in general to address the synergies and replicability.

***The action should also adequately address the barriers which currently hamper the full deployment of climate services in the given area and solutions to tackle these.***

One of the objectives of VISCA is the definition of an action plan to tackle barriers and opportunities derived from the full deployment of VISCA on the 3 demo sites (Objective 10, WP4). With the contribution of wine companies (end users), the potential barriers for DSS adoption and their adaptation actions during the proposal will be described (see **Table 5** and **Table 3.2.b: Critical Risks for Implementation**)

***The funded action for climate services may be part of a larger development (e.g. infrastructure, wind farm) that is funded by additional or follow-up resources, be it private or public.***

VISCA is a demanded service that rose after the trials that three vineries have been developing together with a research center independently, to monitor and improve vinery management and quality parameters regarding climate variations on their geographical area. All three wine companies are currently associated to a research center or university, and using meteorological data from their own field station. VISCA objective will go along the research areas that these three vineries have been carrying out, benefiting from the experience and the empirical models that the end-users are currently applying, but improving the climatic data with numerical, well-proven models. As an example of this, in 2004 the Mixed Research Unit (Join Research Unit, JRU) was created between COD and IRTA, (see section 4&5), and since then they have been working together in projects on precision agriculture/adaptation strategies on vineyards.

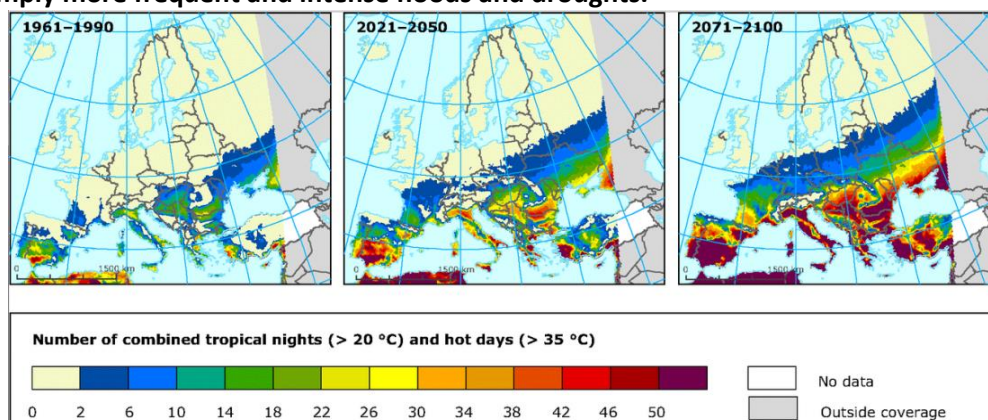
## 1.3 Concept and methodology

### 1.3.1. Concept

#### Background

Internationalization of the markets has allowed for the globalization of agriculture, benefiting - directly or indirectly – relevant countries or even entire regions like the EU, who is the first trader in agriculture products of the world<sup>10</sup>. Due to its dependency on local climatic conditions, agriculture is highly sensitive to changes in climate, impacting stakeholders of the food chain (farmers, buyers, consumers, etc.) and resulting even in political conflicts. For example, El Niño phenomenon, explains between 15% and 35% of global yield variation in wheat, oilseeds, and coarse grain.

Indeed, it has been observed an increase of the warming for the second half of the 20<sup>th</sup> century, likely to be due to an increase in greenhouse gas (GHG) concentrations from human activities emissions. Climate projections show that weather events worldwide are very likely to become more extreme and frequent. **The latter would imply more frequent and intense floods and droughts.**



**Figure 1. Projections of extreme temperatures as represented by the combined number of hot summer (June-August) days (TMAX>35°C) and tropical nights (TMIN>20°C)<sup>11</sup>**

<sup>10</sup> <https://ec.europa.eu/jrc/en/research-topic/agricultural-markets-and-international-trade>

A general conclusion is that Southern Europe will be frequently affected by heat waves, therefore making this region more vulnerable to droughts and wildfires. The most severe human consequences of droughts are often found in semiarid regions where water availability is already low under normal conditions, water demand is close to, or exceeds, natural availability, and/or society lacks the capacity to mitigate or adapt to drought<sup>11</sup>.

In Mediterranean countries, droughts can lead to economic damages larger than floods or earthquakes (e.g., the drought in Spain in 1990 affected 6 million people and caused material losses of US\$ 4.5 billion)<sup>12</sup>. To make this scene even worse, Mediterranean countries are prone to undergo precipitation decrease due to climate modification and demographic changes<sup>13</sup>.

Even if policies and efforts to reduce GHG emissions prove effective - EU supports the objective to reduce its GHG emissions by 80 % to 95 % by 2050 (compared with 1990) -, **some climate change is inevitable; therefore, strategies and actions to adapt to its impacts are also needed, since extreme weather events worldwide (basically floods and droughts) will clearly alter the global food production patterns:** the general trend for crop productivity is expected to be negative in low latitude and tropical regions, but positive in high latitude regions.

**Among the different varieties of agriculture species, the wine-grapes are specially threatened by climate change since premium wine-grape production occurs only within very narrow climate ranges,** and therefore subtle differences in microclimate impacts directly through over-ripening, rising acidity levels, greater vulnerability to pests and diseases, etc. resulting in changes in wine quality and properties<sup>14</sup>. Although wine is not essential to human survival, wine is an important product of human ingenuity, and climate changes affects negatively the European wine industry, which is the world leader in terms of wine production with 17 billion liters per year<sup>15</sup>. In particular, direct and indirect economic activity linked to winemaking and the commercialization of wine is the main economic activity of regions from South of Europe.<sup>16</sup>

Although wine production in Europe is endangered by the emerging introduction in the market of other countries (China, Chile, South Africa, New Zealand, etc.), the consequences of a climate change represent a more serious threat. In fact, **the warming in this century is projected to grow and it will likely exceed 1.5°-2°C** (depending on the scenario), **which could imply a decrease of the suitable area for viniculture from 19% to 73% in major wine producing regions by 2050**<sup>17</sup>. This, in addition to the frequency increase of extreme events, poses a serious threat to the wine production industries in Europe. It is evident that **European wine industry should be concentrating efforts on adaptation measures, as subtle climate variations alter irreversibly the wine-grapes.**

### Wine market situation in EU

The European Union is responsible of the 60% of world wine production, making it the world's biggest wine producer<sup>18</sup>. The production fluctuations are very important, making this sector very sensitive to weather conditions and/or sanitary conditions of the vines. This is extremely important in some European Southern regions, whose economic activity is linked to winemaking and to the commercialization of wine, reason why EU efforts have been made to securing market stability, both regarding the volume and quality of wine produced. However, for the past two decades the EU wine sector has faced two major challenges: both in habit consumption and in overproduction. In particular, a change in pattern consumption in the Mediterranean countries has meant that basic table wines for a daily consumption have been replaced with high value quality wines for special occasions, which has impacted in a decline in volume of wine consumption.

Additionally, the EU has suffered from overproduction, which made the EU wine production less competitive on the world market. This led to a set of market interventions undertaken since 2008: (i) grubbing-up, (ii) issuing planting rights, (iii) abolishing crises distillation, (iv) reevaluating enrichment practices, (v) labeling rules and (vi)

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<sup>11</sup> <http://ftp.jrc.es/EURdoc/JRC55386.pdf>

<sup>12</sup> Managing the Risks of Extreme Events and Disasters to Advance Climate Change adaptation (IPCC, 2012)

<sup>13</sup> [http://ec.europa.eu/clima/change/consequences/index\\_en.htm](http://ec.europa.eu/clima/change/consequences/index_en.htm)

<sup>14</sup> Metzger, M. J., & Rounsevell, M. D. A. (2011). A need for planned adaptation to climate change in the wine industry. *Environmental Research Letters*, 6(3)

<sup>15</sup> <http://www.euractiv.com/sections/agriculture-food/climate-change-threatens-european-wine-production-317583>

<sup>16</sup> WINE - Market Situation. Evolution and Background Information Updated July 2015

<sup>17</sup> Hannah L., *et al.* (2012). Climate change, wine, and conservation, *PNAS*, 110(17), 6907–6912

<sup>18</sup> [http://ec.europa.eu/agriculture/wine/statistics/market-situation-2014-07\\_en.pdf](http://ec.europa.eu/agriculture/wine/statistics/market-situation-2014-07_en.pdf)



offering more flexibility on oenological practices.<sup>19</sup> In summary, EU is investing in creating a sustainable wine industry in order to secure the economic wealth of the wine producer region, maintain the current wine production, while being competitive among high quality wine.

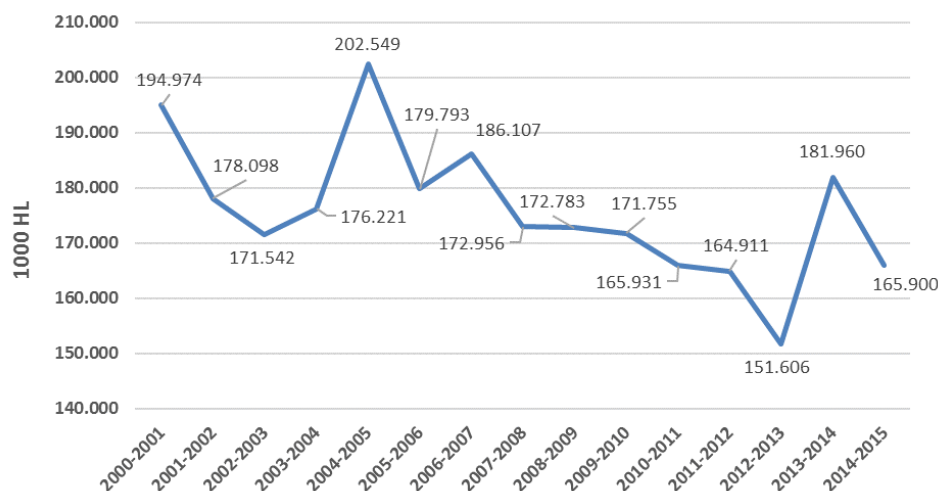


Figure 2. Total EU-28 Wine Must Production Evolution (1 May 2015)<sup>20</sup>

Studies have proven vine is vulnerable to climate changes effecting quality and quantity of grape production. Climate change will also modify the area suitable for viticulture, some studies have calculated a decrease between 25% - 73% and 19% - 62%<sup>21</sup> in major wine producing regions by 2050<sup>22</sup>; Other studies lower this percentage for the most important European vine-producing countries to 2–48%.<sup>23</sup>

The wine industry needs to tackle adaptation measures: medium-term measures adapting the life cycle of the vineyard to the predicted seasonal climate conditions, and long term adaptation measures which will provide producers with a comparative advantage over competitors. VISCA aims at providing a tool to apply the knowledge from different disciplines (e.g. meteorology, climatic, IT, agriculture, etc.) and develop new techniques, which would enable wine producers from the Southern of Europe to produce better quality wines and more quantity, thus impacting on the prices and on the AWU (Agricultural income per annual working unit).

**The design of adaptation strategies to climate change and extreme weather events at all decision making levels (end-users, regional and international authorities and policy makers) becomes essential to allow for a sustainable development of the regions more affected by it, and to help the agriculture industry to plan for an uncertain future<sup>14</sup>.**

### 1.3.1.1. Deconstructing VISCA

We have mentioned before that grapevines are extremely sensitive to their surrounding environment, with seasonal variations in yield much higher than other common crops. This fact has been studied by several authors. E.g., Keller (2010)<sup>24</sup> states that *an upward shift in seasonal temperature will dramatically shift the growing season thereby changing the normal pattern of grape development toward an earlier onset of flowering, veraison, and harvest*. Likewise, Santisi wrote: *Since minor shifts in seasonal temperature “can make the difference between a poor, good, or excellent vintage ... colder-than-normal temperatures lead to incomplete ripening with high acid, low sugar, and unripe flavors (whereas) warmer-than-normal temperatures create overripe fruit with low acid, high sugar, high alcohol and cooked flavors”*<sup>25</sup>

<sup>19</sup> USDA Foreign Agricultural Service, GAIN Report, IT1512, 02/24/2015

<sup>20</sup> [http://ec.europa.eu/agriculture/wine/statistics/market-situation-2014-07\\_en.pdf](http://ec.europa.eu/agriculture/wine/statistics/market-situation-2014-07_en.pdf)

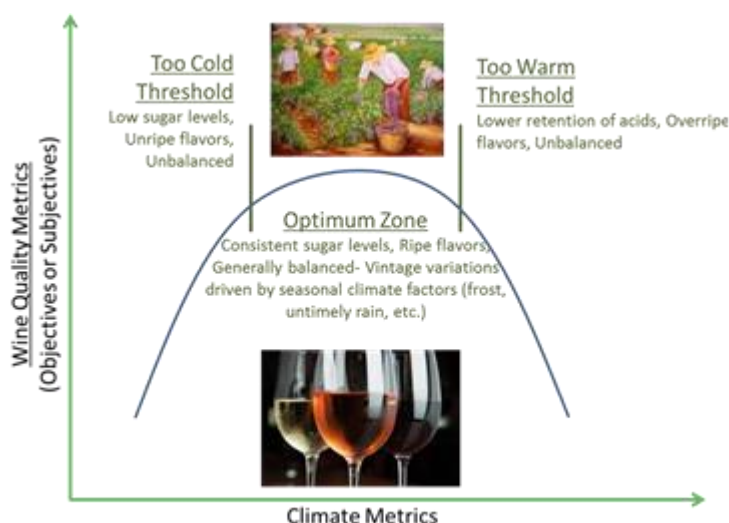
<sup>21</sup> Percentage calculated for the high Representative Concentration Pathways (RCP = 8.5) and for the lower RCP (4.5).

<sup>22</sup> <http://www.pnas.org/content/110/17/6907.full.pdf>

<sup>23</sup> <http://onlinelibrary.wiley.com/doi/10.1111/ajgw.12168/pdf>

<sup>24</sup> Keller M.M. (2010). Managing grapevines to optimise fruit development in a challenging environment: a climate change primer for viticulturists. *Aust. J. Grape Wine Res.*, 16, pp. 56–69

<sup>25</sup> Santisi J. (2011). Warming up the wine industry. *E: Environ. Mag.*, 22 (6), pp. 15–17

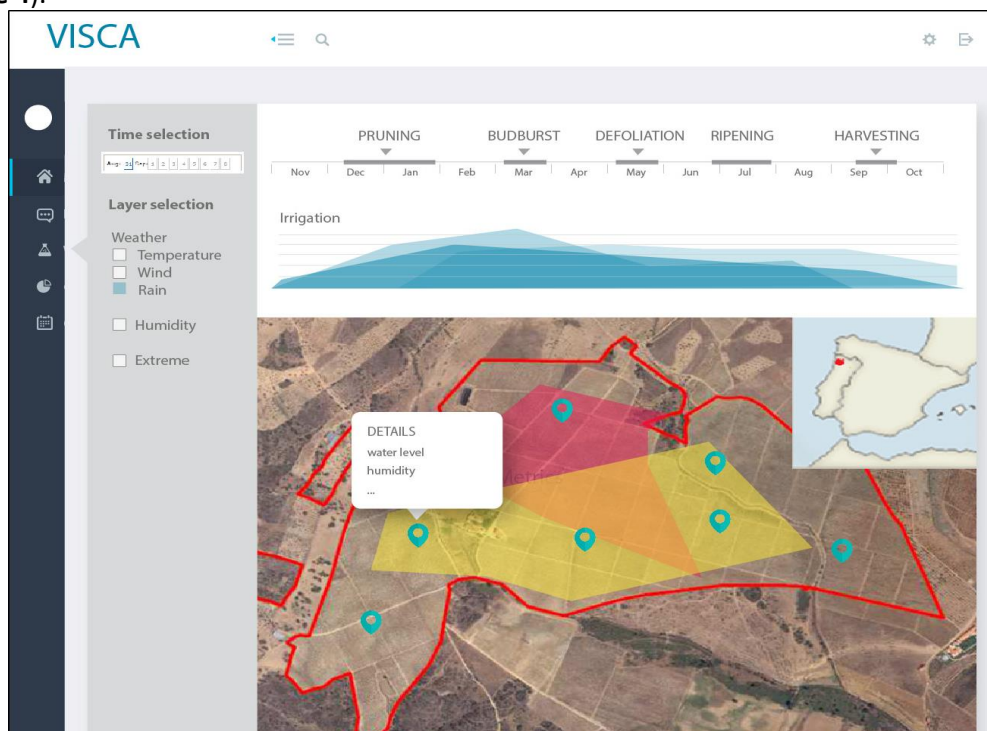


**Figure 3. Relationships and thresholds between climate and wine production and quality metrics**

There is an optimum climate zone for grapes harvesting, during which the sugar content and acid concentrations are consistent and lead to a high-quality product, reason why it is better to adapt the vineyard cycle to the climate, so production can occur in the optimum zone. In this so-called “optimum zone”, the vineyards lead to higher quality wines as it provides a more equitable growth period and tends to balance the four ripeness clocks that are running simultaneously but at different rates, —sugar accumulation, acid respiration, phenolic ripeness, and fruit character.

Under these conditions, vineyard management will play a strategic role to adjust harvest time with required grape quality, and one of the most relevant will be irrigation management (or in

general plant water status), since it is one of the most relevant factors determining grape quality<sup>26</sup>. **VISCA will integrate several data sources** such as end-users requirements, soil properties, vineyards characterization, together with forecast from climatic, irrigation and agricultural models **into a Geospatial database**. All this information will be supplied to the **Decision Support System, which will forecast the optimum harvesting dates, and compare it with the current state of the life cycle of the vineyards**. If this period is out of ideal conditions, it will suggest end-users crop management actions to apply to adjust the life cycle of the vineyard: (i) re-prune vines at the theoretical optimal time to re-start the vine cycle and ripen the fruit during ideal conditions, (ii) apply different levels of pruning intensity or defoliation during post-veraison, to achieve the target alcohol level, or (iii) to adapt other orchard management practices (mainly irrigation) to fit harvest time with high quality grapes (Figure 4).

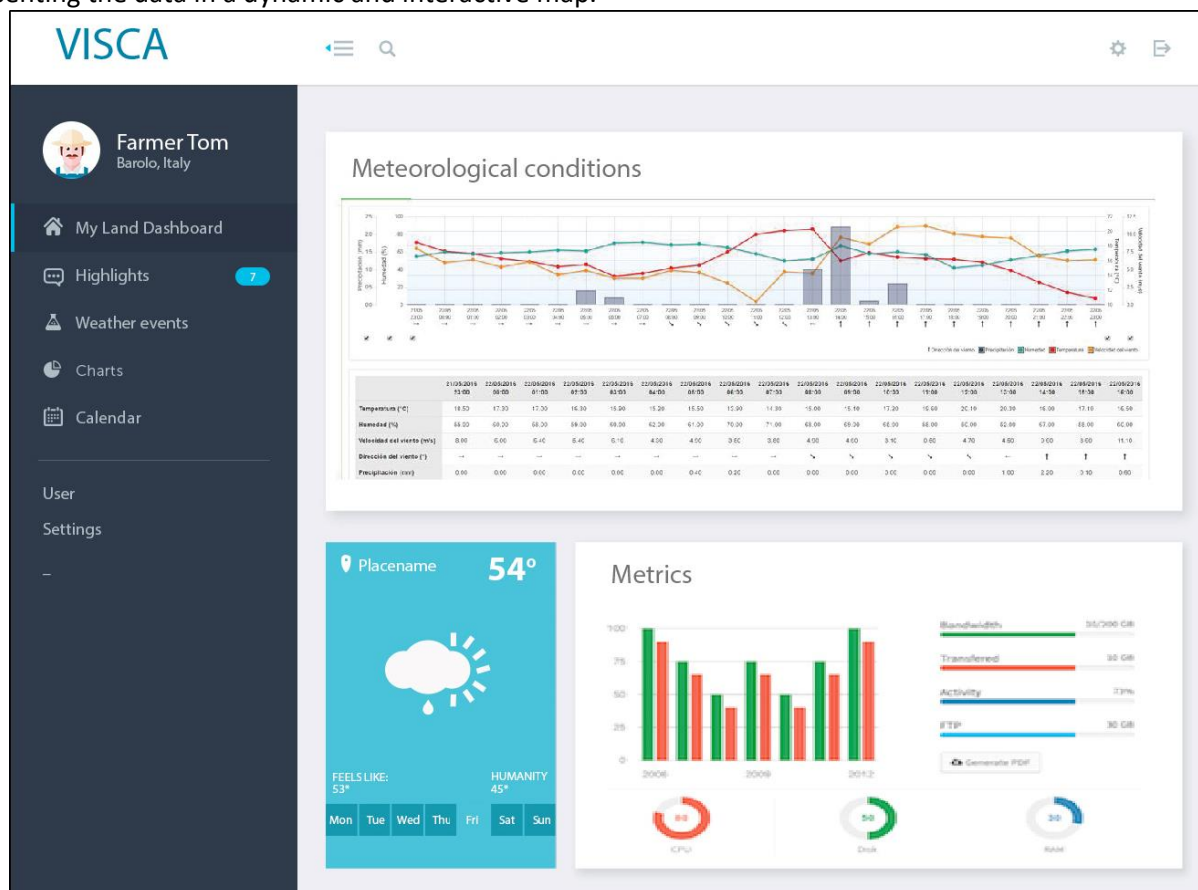


**Figure 4. Example of a dashboard: forecasting of optimum harvesting dates**

<sup>26</sup> Girona, J., Marsal, J., Mata, M., Del Campo, J.; Basile, B. (2009). Phenological sensitivity of berry growth and composition of Tempranillo grapevines (*Vitis vinifera* L.) to water stress. *Aust. J. Grape Wine Res.*, 15, pp. 268-277

After the harvesting, evaluation of the tool will be done, based on the quality and quantity indicators obtained from the vineyards of the demos-site, compared to those from the control vineyards (i.e. they haven't undergone any crop management treatment). Quality will be measured under the wine quality parameters (sugar concentration, acidity, pH, phenolic composition, and aromatic composition) and the quantity will be measured in Kg or Tones. Advantages on strategical-logistical decisions can also be evaluated (savings of money by knowing in advance the amount of fruit they need to sell/buy according to the forecasted yield).

The DSS will implement a visualization dashboard containing selectable and actionable geospatial data layers presenting the data in a dynamic and interactive map.



**Figure 5. Example of a dashboard: Meteorological information** (this is just an example, in reality, the seasonal values will appear as a range, not as a single value)

### VISCA Strategies

The development of adaptation tools can provide end-users and policy makers with well-founded, informed decisions to embrace the challenges that climate variations is causing on the agriculture business in general, and here on wine production business in particular. VISCA has been designed to include climate forecasting at different scales, which give main wine actors an action window to take decisions beforehand. VISCA will work along three strategies:

#### **Short-term strategy:**

Warning of extreme events (e.g. heat waves, hail, storms) that could damage the vineyards, based on forecast time scales from hours up to five days, using a mesoscale numerical weather prediction system (WRF-ARW). Warnings on extreme events are thought to allow for the end-user to apply preventive actions, e.g. to face a heat wave, the preventive action to activate in RAIMAT would be irrigating 2 days before the heat wave. The accuracy of the irrigation timing is very important for them: if they do it just before, during or after, it will be too late because the vines will not recovery easily.

**Medium-term strategy:** decision making of specific aspects of crop planning (i.e. budburst, ripening, harvesting, pruning, defoliation, etc.), based on seasonal (i.e. 6 months in advance) forecasts. The main outcome of the application of phenological models fed by the outcomes of seasonal forecasts outcomes (temperature and precipitation) will be:

1. Prediction of fruit ripening. If this period is out of ideal conditions, end-users can re-prune vines at the theoretical optimal time to re-start the vine cycle and ripen the fruit during ideal conditions.
2. Prediction of prevailing temperature conditions during the post-veraison period and the occurrence of drought in the vineyard. In function of this forecast, different levels of pruning intensity or defoliation may be carried out during post-veraison, to achieve the target alcohol level.
3. Estimation of yield depending on geographical conditions. Based on this forecast, end-users know whether they need to buy more or less fruit from our winegrowers in order to match end-users' needs (strategical-logistical decisions).

**Long-term strategy:** (i) Historical decadal climatic data linked with historical starting and ending veraison and harvest dates and (ii) decadal climatic projections to predict veraison and harvest dates for 2030, 2040 and 2050 for each variety of grapes, allowing for the understanding of climate change on the vineyards' lifecycle, which implies doing long-term strategic crop planning, with the ultimate goal of making the South-European wine industries resilient to climate change.

We have mentioned climatic and agricultural models, but the fact is that there will be several types of models used to feed the tool. **Table 1** shows all types, names inputs and outputs of the models that will be run during the project. More information about them can be found in Table 3.1.a, WP2.

**Table 1. Description of the different Models integrated in VISCA. Inputs and Outputs**

Name of the Model	Type	Inputs	Outputs	Developer
North American Multi-Model Ensemble & Copernicus Climate Change	Seasonal Forecast Systems	BSC is going to work with available seasonal forecast systems.	Temperature and precipitation	BSC
BRIN	Phenological (dormancy)	Max. & Min. temperature	Bud break	IRTA
Berry Model	Phenological	Max. & Min. temperature from bud break to 1 <sup>st</sup> December	Blooming; berry set; veraison; berry maturity	IRTA
Crop-Syst	Phenological/ yield and quality prediction	Daily max and min temperature and humidity, global solar radiation. Vineyard physical description; Physical properties <sup>27</sup>	Plant water status, harvest date, <b>yield</b> , <b>quality traits</b> .	IRTA
Leaf Model	Phenological	Daily temperature, solar radiation, and rainfall	Estimation of the date of defoliation (leaf fall), that represents the end of the vegetative period of the vines	UNAP
VSIM	Irrigation	Soil type; vineyard physical description; ET <sub>0</sub> (daily max and min temperature and humidity, global solar radiation, wind speed)	Annual plant water requirements	IRTA
CCSM4 <sup>28</sup> , CMCC-CM <sup>29</sup> CMCC-CM5 <sup>30</sup> , MIROC5 <sup>31</sup> ,	*Decadal (ensemble)	Temperature and precipitation (taken	Temperature and precipitation for 2030,	MET

<sup>27</sup> Canopy light interception and crop load

<sup>28</sup> NCAR Community Climate System Model

<sup>29</sup> Centro Euro-Mediterraneo per Cambiamenti Climatici

MPI-ESM-LR <sup>32</sup> , MPI-ESM-MR <sup>33</sup> MRI_CGCM3 <sup>34</sup>		from the different models considered prior to the ensemble)	2040 and 2050	
WRF	Weather forecast for extreme events	GFS data <sup>35</sup>	Temperature, accumulated precipitation, wind speed, snow falls, hail and heat/cold waves.	MET

\* The models used for the decadal projection will be selected from the downscaled Euro-Cordex dataset and the 5<sup>th</sup> Coupled Model Intercomparison Project (CMIP5) with simultaneous availability of the historical and projected Global Climatic Model (GCM) runs. These is a list of models eligible for our purposes.

### 1.3.1.2. Testing and Validation of VISCA in 3 demo-sites: Raimat, Avellino and Alto Douro

On this regard, the 2 crop management actions planned to be applied by the end-users in the demo-sites of VISCA and the demo-sites where they are to be applied (depending on local weather, grape variety and soil characteristics) are being explained in detail below:

#### 1. Crop forcing (Spain and Portugal)

From 1950 to 1999, the majority of the world's highest quality wine-producing regions experienced growing season warming trends<sup>36</sup>. The effect of the future warming could make progressively more difficult the ripening of balanced fruit required for existing varieties and wine styles. On this regard, **Crop forcing is a new technique that has shown promise results in California**, and it is based on moving the grape-ripening period from hot summer months to a cooler month later in the growing season. This is achieved by making an additional pruning (severe leaf removal), stopping the natural cycle of the plant and forcing the plant to restarting its cycle later.

Crop forcing therefore produce a later budburst and harvesting, which means that the vineyard cycle is forced to be shorter and delayed on time, in order to achieve a ripening under cooler temperatures, resulting in wines with more bouquet. **The main obstacle to this technique is to know with enough accuracy when to begin with the vineyard cycle and therefore when to apply the additional pruning in the absence of monthly, seasonal and subseasonal meteorological information. Accurate predictions of this meteorological data is needed.**

In particular, **Crop Forcing** will be applied on fields located in **Raimat (Codorniu, Spain) and Quinta do Ataíde (Symington, Portugal)**, where the climate is dry and very warm, and thus it is foreseen that climate change will have an impact on the life cycle of the vineyard by rising the atmospheric temperature. Seasonal forecast predictions will be integrated into phenological models for vines that received pruning at different times (crop forcing) to determine if the reduction of the length of the vineyard cycle can facilitate grape ripening under cooler temperatures, resulting in wines with more bouquet<sup>37</sup>. Both Raimat and Alto Douro have dry climates, but there are differences in soils properties and grapes varieties between locations:

#### Spain (Codorniu)

Raimat wine cellar is located in a region called Costers del Segre (DO)<sup>38</sup>, in the southwest slope of Raimat hills. This location confers special and differentiated characteristics: higher sunlight exposure in the afternoon, which allows the grapes to accumulate more degree days, achieving an earlier ripening without losing acidity. These are well drained soils; the slight inclination of the fields confers a natural draining of the rain water. Being on the slope of the hill causes steady currents of air, which provides a natural cooling down, conferring a special microclimate.

<sup>30</sup> Centre National de Recherches Meteorologiques / Centre Europeen de Recherche et Formation Avancees en Calcul Scientifique

<sup>31</sup> University of Tokyo, National Institute for Environmental Studies, and Japan Agency for Marine-Earth Science and Technology

<sup>32</sup> Max Planck Institute for Meteorology

<sup>33</sup> Max Planck Institute for Meteorology

<sup>34</sup> Meteorological Research Institute-Japan

<sup>35</sup> <https://www.ncdc.noaa.gov/data-access/model-data/model-datasets/global-forecast-system-gfs>

<sup>36</sup> Jones G.V, White M.A, Cooper O.R. and Storchmann K. (2005). Climate change and global wine quality. *Clim. Change* 73(3):319–343.

<sup>37</sup> Crop Forcing

<sup>38</sup> Costers del Segre is also the name of the Designation of Origin (DO)



The viticulture performed in this plot is ecological, where the green pruning is especially important: buds and leaves thinning is used to adjust the vine's productive-vegetative equilibrium. The soil keeps a vegetal cover that contributes to increasing the biodiversity, plus controlling the erosion of the soil.



**Climate:** Costers del Segre region has a continental climate, with annual rainfall between 300 and 450 mm. Annual average temperature is around 15°C, but variations among the year are remarkable, going below 0°C in winter and overpassing 35 °C in summer.

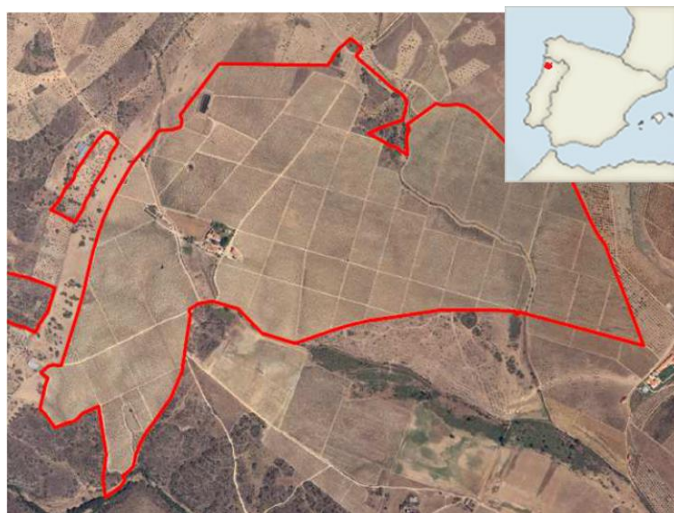
**Grape variety:** Chardonnay and Tempranillo

**Soil composition:** lutites (mineral clay and limestone) with sandstone (compact fine sand).

Most important aspect of the Spanish site is that they will apply commercial vinification on the demo-site, and not micro-vinification: the area devoted to the site will be 3 ha, and therefore the final results will be comparable to a medium-size wine cellar, and therefore results will be representative of a commercial approach.

## Portugal (Symington)

Symington Family Estates (SFE) is one of the principal Port producers and is the leading vineyard owner in the Douro Valley with a total area of 1,006 hectares (2,486 acres) of vines spread across 27 Quintas dotted around the Douro's three sub regions (Baixo Corgo, Cima Corgo and Douro Superior) in what is the world's



largest mountain vineyard. Portugal's geographic isolation, as well as some past conservatism on the part of its wine producers has worked in the country's favor in terms of the preservation of the rich genetic diversity of its indigenous grape varieties. The demonstration site, Quinta do Ataíde, is located in Douro Superior and it has in total 85 ha vineyards. It consists of two plots with the variety Touriga Nacional, and one plot with Touriga Franca. Although Ataíde has a fairly homogeneous, flat terrain, sandy-loam and loam soil composition, uneven soil drainage has been identified to result in some variance in grape quality.

**Climate:** The Douro enjoys its own micro-climate, which is an important reason for the quality and style of its wines. The most important geological features responsible for this are several mountain ranges sheltering it from the Atlantic Ocean influence, giving it a continental climate, with hot and dry summers and cooler and wetter winters. Average annual temperatures range from 11.8 to 16.5° C. Rainfall ranges throughout the year from 50.6 mm in the wettest month down to 6.9 mm during the driest month.

**Grape variety:** Touriga Nacional

**Soil composition:** sandy-loam and loam.

**IMPORTANT NOTE:** There is a difference between the Spanish site and the Portuguese site, in terms of the methodology and the intensity of work to be applied during the project. While the Spanish site is a validation-site for the tool, the Portuguese site will be a test-site, and therefore will be used mainly for observation purposes. The verification intensity will be consequently lower: crop forcing will be applied, phenological data of main events will be gathered, and eventually the final results will be used to validate the models tuned by IRTA/UOPORTO. **Main interest to include Portugal is to make a differentiation between Atlantic and Mediterranean climates, and how this difference may affect the phenological models used in VISCA (see Table 1).**

## 2. Canopy management (Italy)

During the last decades, an increase in sugar accumulation rate in the berries has been reported in several important viticultural areas around the World (France, Spain, Italy, Australia, South Africa, etc.). This results in an undesired increase in alcohol concentration in the wine when harvest is carried out at the right phenolic maturity. The main driver of the increase in carbohydrate accumulation (sugars) in the berries is considered to be the global warming. Different post-veraison summer pruning techniques have been proposed as possible strategies to decrease leaf to fruit yield ratio and to slow down carbon partitioning to berries and therefore sugar accumulation.

However, in rainfed vineyards, the decision of the correct intensity of post-veraison leaf removal to apply does not depend only on the crop load, but also on the level of water stress that occurs. **The main obstacle to apply this technique is to know with enough accuracy prevailing temperature conditions during the post-veraison period and the occurrence of drought in the vineyard.** Therefore, estimation of the date of defoliation (leaf fall), it is important to know in order to remove, starting from that date, transpiration in the soil water balance models.

**Canopy Management** will be applied in the Italian demo site, **Mirabella Eclano (Mastroberardino, Italy)**, with rain-fed (i.e. no dry climate) vineyards, where the critical decision here will be the correct intensity of post-veraison leaf removal (defoliation)<sup>39</sup>. In function of the weather forecast, different levels of pruning intensity or defoliation may be carried out during post-veraison to achieve the target alcohol level. Therefore, seasonal (i.e. 4 months in advance) forecasts are needed before this technique can be safely applied.

### Italy (Mastroberardino)



Mastroberardino is an Italian winery located in the Campania region. The demonstration site is located in Mirabella Eclano Estate, in the heart of the Taurasi DOC area. The vineyards are surrounded by a large natural landscape, not far from the archaeological excavations of Aeclanum. The estate covers 65 hectares on hill territory with an altitude between 350 and 450 meters above sea level. The epicentre of Aglianico production, research and experimentation, this estate is spread over several hills with different exposures and is dedicated to the production of red grapes on the slopes.

**Climate:** The climate is continental and characterized by large thermal day-night excursions (up to 20 °C).

Average annual rainfall is around 750 mm.

**Grape Variety:** Aglianico

**Soil composition:** Deep soil of volcanic origin, with layers of clay and traces of limestone along the profile, sandy loam texture.

### 1.3.1.3. Positioning of the project: Technology Readiness Level (TRL)

In a view of maximizing its impact, VISCA system will be developed to a very high Technology Readiness Level (**Table 2**). The target is to end the project will all main components ready for the market, so as to ease the take-up by the SMEs/industries that build the consortium. VISCA will advance technology minimum to TRL7 (system prototype demonstration in operational environment), corresponding to the advances validated during the demonstration pilots that will take place during 2 years. The DSS will be implemented using enterprise software architectures, modern frameworks, and it will feature a commercially ready deployment on a Cloud Computing platforms.

<sup>39</sup> Canopy Management

**Table 2. TRL to be achieved by VISCA products**

Product	TRL	Advances in VISCA
North American Multi-Model Ensemble & Copernicus Climate Change	6	Starting from a TRL 3 (BSC has experience working with seasonal forecast systems but further developments are needed to find wine users needs), and as a result of the collaboration with the wine stakeholders within the VISCA consortium we aim at achieving TRL6 by co-developing a prototype and applying it to the specific locations of interest.
Models used for the decadal projections	7	Decadal models are global. We will work at 100% applying an ensemble of several models. Afterwards, we will validate the data in the past with historical data at every demo-site.
WRF	7	The model will be calibrated and validated for every demo site; therefore we expect to reach TRL 7. We will obtain a more accurate prediction (temperature, wind, and relative humidity).
BRIN Model	7	The model will be calibrated, and adapted to the specific climatic Mediterranean conditions and the main used cultivars in this area.
Berry Model	7	The model will be calibrated and adapted to other uses like cropforcing to determine regrowth and 2 <sup>nd</sup> blooming, and berry growth stages.
Leaf Model	7	The model will be calibrated, and adapted to the specific climatic Mediterranean conditions and the main used cultivars in this area.
Crop-Syst	7	The model will be specifically improved as a general platform to integrate and run the more specific models.
Phenology model (canopy management)	7	we will generalize the model to different grapevine cultivars grown in different environments
VSIM		
*Cross-Platform Mobile Application	8	Cross-platform development to achieve high adoption, and support for both smartphones and tablets
*Geo-Spatial Database	8	Selection of the best technology available on the market and Cloud based deployment in order to achieve scalability. Connection with frontend to deliver geospatial information in a bandwidth efficient manner
*Data Visualization	8	Engineered visualization dashboard that will contain all relevant data in a single interactive map-based view.

\*ISMB have implemented a DSS and a mobile app within FLOODIS<sup>40</sup>, both with a visualization dashboard of geospatial data. The same approach and technologies will be used in VISCA but with a strong customization aimed to fit the different domain and data.

#### **1.3.1.4. National / international research and innovation activities linked with the project**

**Table 3. National/international research & innovation activities which will be linked with the project**

Project & Brief description	Outcomes that will feed VISCA
<b>INIA-2013-2016 (IRTA):</b> This project has a final goal to estimate grapevine water requirements during the following four decades considering the influence of climate change scenarios	Adequate choice of phenological models to simulate growth events in Chardonnay, and data on crop water consumption after harvest that will be used for the calibration of the irrigation model.
<b>SPECS<sup>41</sup> (BSC):</b> research to produce reliable climate predictions by identifying the main problems in climate prediction and investigate a battery of solutions from a seamless perspective.	Improved estimation of the future frequency of high-impact, extreme climatic events and of the prediction uncertainty. More informative view of meteorological variables to help vineyard management.

<sup>40</sup> <http://www.floodis.eu/>

<sup>41</sup> <http://www.specs-fp7.eu/>



<b>EUPORIAS<sup>42</sup> (BSC)</b> : reliable predictions of the impacts of future climatic conditions on different sectors such as agriculture and water.	Development of a new realm of climate services and tools using climate predictions with tailored information and easy application in a decision-making context.
<b>SECTEUR<sup>43</sup> (BSC)</b> is a Copernicus project that works with businesses and other organizations to understand their requirements, in terms of weather and climate data to support decision-making.	Within the Agriculture and Forestry sector, the BSC is working with wine companies to understand their needs and define user driven tailored products.
<b>Development of a predictive quality model red wine based on annual parameters in Rioja (CODORNIU)</b> applied the model Crop-Syst to predict grape quality for winemaking with two or three weeks before the harvest, considering as indicators partition parameters corresponding to the general carbohydrate model.	CropSyst, will be used in VISCA, as well as other indicators, to determine in advance the quality of the grape (meteorology, water status of the plant, vigor, etc...). Besides this, VISCA will feed Crop-Syst with seasonal data, so we can predict grape quality 4-5 months in advance.
<b>FLOODIS<sup>44</sup> (Coordinator ISMB)</b> is a Copernicus EMS downstream service that couples crowdsourcing with Earth Observation to build a better flood information system. It also features a novel flood forecast model taking into account weather forecasts.	The visualization library as well as the software patterns of the Cloud centralized component, together with the know-how about cross-platform mobile development developed in FLOODIS will be the starting point for the design and the implementation of VISCA.
<b>WEAM4i<sup>45</sup> (Coordinator MET)</b> aims at improving the efficiency of water use while reducing the costs of power irrigation systems.	Deployment of the Portal and App to support farmers and irrigation communities in the water and energy strategic management.
<b>PROJECT CAMPUS QUARC (MAST)</b> aimed at improving the efficiency of the production processes to increase the competitive markets of 5 agri-food sectors of excellence in the Campania Region: Wine, Pasta, Olive Oil, Dairy Products and Chestnut.	Information of efficiency and competitiveness of other sectors, especially Olive Oil, which will be very well used in D 5.4. on replicability. This deliverable will include as well replicability of the tool in other geographical locations.
<b>SMARTAgriFor (UPORTO)</b> Improving knowledge transfer between Universities and Companies in key value chains (including grapevine/wine ; fruits and vegetables ; olives/olive oil ; forestry)	Network and methodologies used for enhancing collaboration between of key stakeholders in the agriculture and forestry value chains and research organizations.

\*\* the projects above detailed embrace those ones with consortium's partner participation. Further Development of the State of the Art can be found in Table 4.

### 1.3.2. Methodology

The project will entail a total of 36 months, allowing for 2 years' demonstration (2 entire vineyards lifecycles). Climatic data will be produced during the first year by BSC and METEOSIM, to feed the agricultural models (phenological and irrigation) run by IRTA, UNAP and UPORTO, in order to predict the theoretical optimal date for critical phenological events of interest for end-users to make informed decisions on the crop management strategies to apply (bud-bursting, defoliation, harvest, among others), and the minimum water needs. Another data source to be integrated together with climatic data and models will be the **required specifications of end users: maximum temperature for harvesting, optimal ratio of sugar concentration to acidity of the grape juice, and variety of grapes**, in order to provide with the appropriate information to every demo site. This information is subsequently integrated into the software and eventually visualized through a set of modules (see **Figure 6**), which will give rise to the production of informed, strategic data for farmers and wine producers, to be used

<sup>42</sup> <http://www.euporias.eu/>

<sup>43</sup> <http://climate.copernicus.eu/secteur>

<sup>44</sup> <http://www.floodis.eu/>

<sup>45</sup> <http://weam4i.eu/>

within their crop management plan. A pilot plot will be used in the 3 demo sites within the commercial fields of the end-user wineries involved. Every pilot orchard will have a size of minimum 1 ha and vines will be grown and trained according to the commercial practices of each concerned winery. During the first year of the project, those orchards will be used for the calibration/validation of the phenological and irrigation models.

The second year the demonstrations tasks will start, during which the end users will carry out the strategical decisions suggested by the tool, following their targets (maximum harvesting temperature and max alcohol/volume). At the end of the second year first conclusions on the **robustness of the tool will be obtained based on the comparison of quality and quantity of final product obtained** with vineyards over which an adaptation strategy (*via* VISCA suggested solutions) has been applied, and others over which no adaptation strategy has been applied. **Quality will be measure under the wine quality parameters (sugar concentration, acidity, pH, phenolic composition, and aromatic composition) and the obtained quantity (Kg or Tones).**

The second year will be likewise used to calibrate and evaluate climate, weather and agriculture models according to real data. Climatic data will be validated with the information of real parameters gathered during the second year over the third year (second demo year). During the third year the modules of tool will be evaluated altogether using the same parameters of quantity and quality used the previous year. Success of the tool will be measured under the vineyard quality parameters: Forecasting of harvest amount vs. real harvest, plus forecasted harvest date in bud-burst plots vs. real harvest date. Parameters of wine quality (sugar content, acidity, pH, Phenolic composition, aromatic composition) will likewise be controlled to evaluate the success of the tool.

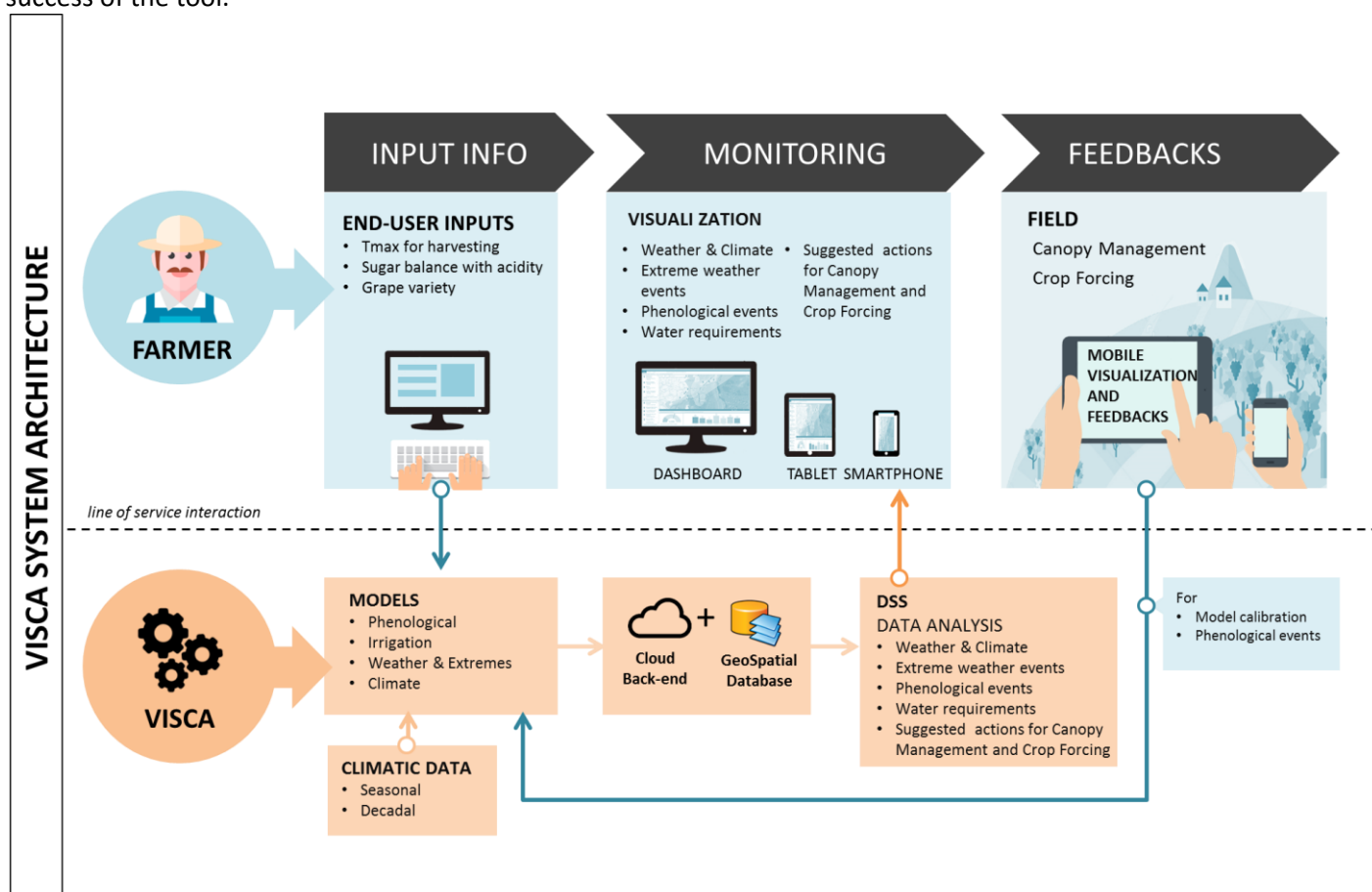


Figure 6. VISCA Overall Architecture

The CS-DSS will implement the logic to couple the phenological data, end-user needs and constraints, and in-field geolocated feedbacks provided through the VISCA mobile application in order to suggest the most appropriate crop planning aspect. Specifically, OGC standards<sup>46</sup> will be used for geolocated data to support interoperable solutions, selecting the most appropriate protocols to minimize the energy consumption and

<sup>46</sup> <http://www.opengeospatial.org/standards>

bandwidth usage of mobile devices. Besides the crop planning tools, the CS-DSS implements a graphical dashboard to effectively visualize all geo-spatial data, including maps and statistics related to sites. In particular, the DSS will be composed of 3 modules (i) Module Climate, (ii) Module Agriculture, and (iii) Module Visualization. Standard interfaces will be implemented to ingest the data required by the optimized crop planning tools, and to disseminate the outputs to the mobile application, which will be used by end-users in the field.

During the entire project lifetime, the main barriers to apply the tool at the demo sites will be gathered and compiled into a deliverable belonging to WP4 (D4.5). Furthermore, the forecasting of extreme events will allow the design of preventive actions **to minimize risks and costs in the production**. Finally, **decadal historical climatic data of the last 30 years and projections for the years 2030, 2040 and 2050 will be generated** to provide information on the change over time of the harvesting dates linked with climate data.

### 1.3.3. Sex and Gender Analysis

As for the gender equality aspects, VISCA consortium is solid, showing a well-balanced gender distribution within the framework of the project, trying to comply with the policy of equality between women and men enshrined as one of the European Union's objectives. VISCA consortium has been proactive in ensuring gender balance among the individuals who are primarily responsible for carrying out the work, in fact, VISCA females' resources percentage is of 42 % in total. Moreover, VISCA consortium will promote equal opportunities in the human resources acquisitions or collaborations arisen during the execution of the project.

## 1.4. Ambition

The awareness of the effects of climate variations has reached the agriculture sector, which is now more inclined to let the scientific community introduce changes in their traditional methods. Our consortium represents well the interest of end users to fight climate consequences (cultural, economic losses) at regional level:

COD/IRTA<sup>47</sup>, MAST/NAP<sup>48</sup> and SYM/UPORTO have a long experience in the development of empirical models to predict grape quality two or three weeks before the harvest, considering the general carbohydrate model CropSyst (developed by IRTA), Phenology model-2015 (by UNINAP), and other indicators like meteorology. However, the lack of seasonal forecasting hindered the definition of a theoretical optimal date for all critical phenological events. Recent advances in climate predictions can provide a more informative view, by modelling future climate variables over months or seasons. In particular, VISCA adds the efforts that have been made during the last decades towards achieving sustainable agriculture and climate-change adaptation and mitigation measures worldwide.

**So far, most efforts have been concentrated to define and provide suitability areas for the crop or livestock to be bred. Taking into account that pruning has always been used in agriculture to control the life cycle of the harvest, VISCA will set the grounds to a revolutionary approach by using phenological models, irrigation models and climate models, to provide information to move the lifecycle of the harvest along the year and adapt to the medium/short-term climate conditions forecasted. This will allow accommodating the harvest dates to the suitable time of the year foreseen, thus achieving a sustainable system that has an increase on productivity and on the income of the farmer.**

VISCA will leverage on recent European projects (e.g. SPECS and EUPORIAS), which brought together an unprecedented group of scientists to address these challenges and support the development of a new realm of climate services and tools based on climate predictions. In particular, VISCA adds the efforts that have been made during the last decades towards achieving sustainable agriculture and climate-change adaptation and mitigation measures worldwide. **Table 4** summarizes the progress beyond the state-of-art and how VISCA will tackle current limitations and problems:

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<sup>47</sup> In 2004 the Mixed Research Unit (Join Research Unit, JRU) was created between COD and IRTA, (see section 4&5)

<sup>48</sup> "Definition of a suitable early summer pruning strategy to modify bunch architecture of 'Greco' wine-grapes", 2012-2016

**Table 4. Progress beyond the State of the Art (SoA)**

Current SoA	Progress beyond SoA introduced by VISCA
<a href="#">SOLMACC</a> : assesses innovative practices that can contribute to reaching the EU's climate change mitigation and adaptation objectives in the food and farming sector.	The progress beyond SoA is to provide additional information by integrating <b>seasonal data models</b> , used to <b>predict phenological events</b> of importance to the application of innovative practices, such as managing vineyard cycle to adapt it to climate changes.
<a href="#">INNOVINE</a> : Study of the effects of vineyard practices in relation with climate change, test of sustainable viticulture practices or systems like adapting canopy management or grapevine vigour in order to modify microclimate conditions.	Testing and monitoring of the techniques to be applied will also be performed in VISCA, in order to calibrate/validate the models. Progress beyond SoA: <b>integration of seasonal climatic data</b> into phenological and irrigation models, <b>and suggest dates of application of the management strategies</b> .
<a href="#">ADVICLIM</a> : Study of climate change adaptation and mitigation scenarios for a range of vineyards (France, UK, Germany and Romania). Monitoring of phenological events and the effect of temperature on these.	Progress beyond SoA: VISCA's aim is not only testing, but <b>validation of a tool that integrates different models</b> , to reach solid adaptation strategies. Validation will be made in Raimat (Spain) for the crop forcing, and Eclano Estate (Italy) for canopy management. Testing of the tool will be made in alto Douro (Portugal). VISCA's demosites are in Mediterranean areas with the view to adapting traditional wine regions to climate change, rather than proposing mitigation strategies like shifting latitudes of vineyards.
<a href="#">LACCAVE</a> : assesses impacts of climate change on vine and wine, explores adaptation strategies and proposes scenarios for the French wine regions in 2050. Wide range of possible innovations, from variety selection to new practices of winemaking.	VISCA will also use long-term climate projections for Spanish, Italian and Portuguese wine regions in 2030, 2040 and 2050. Final results will lead to the <b>assessment of 2 specific techniques</b> (D.2.5) for 3 different Mediterranean regions in Europe, based on results of the validation of the tool during 2 consecutive years.
<a href="#">PERPHECLIM</a> : Observation and archiving of phenological data and models of different species: forestry, fruit and vines. The ultimate objective is to improve the knowledge and management of modelling tools.	Progress beyond SoA: VISCA aims at achieving the calibration of the phenological models through the intensive monitoring in the demo sites. Secondly, VISCA is aiming at the <b>production of a management tool</b> , rather than improving the knowledge of modelling tools.
<a href="#">CLIMATE-CAFE</a> : analyses the effects of climate change on agricultural production, assesses alternative strategies by modelling in order to improve the adaptability of the cropping and farming systems to climate change.	Progress beyond SoA: VISCA will <b>evaluate the effect of 2 adaptation strategies to climate change</b> applied. These will be decided with information from the CS-DSS tool, which takes into account climate data in the phenological models.
<a href="#">VINBOT</a> : based on precision viticulture, identifying and managing variability within vineyards, optimise vineyard performance, in particular, maximising grape yield and quality while minimising environmental impacts and risk. This is accomplished by measuring local variation in factors that influence grape yield and quality (using robotics) and applying appropriate viticulture management practices.	Progress beyond SoA: Besides monitoring and doing on-filed measurements, VISCA will stress the achievement of sustainable wine through the use of seasonal (5 months) weather forecasting. VISCA aims at optimizing the production and minimizing risks through <b>accurate forecasting information, and accurate extreme weather events</b> . Two viticulture management practices already tested in 2 of the demo sites will be applied, after the tool provides with well—founded information.

**VISCA will set the grounds to a revolutionary approach:** the use of open international climatic models to deliver empirical predictions of (i) phenological events, (ii) meteorological extreme events, (iii) minimum water needs (crop-management and logistic decision level) and (iv) decadal projections as strategical and policy-maker decision level.

Secondly, **VISCA will perform real wine-making (not micro-wine making)** in one of the demo sites (Spain), so indicators parameters of evaluation will be based on real scale production. Finally, **VISCA will be translated to a language that the end-users will understand, since the visualization of the tool has also been co-designed with them**, so the information is tailored and easy to understand and apply even in a decision-making context.

## 2. Impact

### 2.1. Expected impacts

#### 2.1.1. Impacts in relation with the Work Programme<sup>49</sup>

**Work Programme:** *systemic approach to promote a more resource-efficient, greener and more competitive economy as a key part of smart, inclusive and sustainable growth*

VISCA will make use of the (abundant), open available climate data on a tool that will provide a systemic approach to strategic decisions related to climate change mitigation and adaptation measures<sup>50,51</sup> applied in agriculture at all levels (farmers, downstream operators, upstream operators, public administrations, policy makers, etc.). VISCA is a challenge-driven (climate change and agriculture), solutions-oriented (mitigation and adaptation strategies to climate change) and innovation tool that crosses disciplinary boundaries and involves co-creation of knowledge and co-delivery of outcomes with industrial and research actors by applying a trans-disciplinary perspective. Furthermore, VISCA will complement the calls promoted in other Horizon 2020 calls, in particular VISCA will contribute to Sustainable Food Security (FSF) – Resilient and Resource-Efficient Value Chains.

**KPI<sub>1</sub>:** Production of forecasted phenology events and yield using climate predictions and projections **(M15)**

**KPI<sub>2</sub>:** Determination of potential modification of plant water requirements according with climatic predictions and projections **(M12)**

**Work Programme:** *initiatives funded should as far as possible use data resulting from or made available through different initiatives of the European Commission*

Aiming at providing real-time robust forecast information, the Copernicus Climate Change Service will be used. All Earth Observation and spatial data produced during the project will be compliant with INSPIRE. Climatic data produced in the project will be made available for re-use under the Pilot on Open Research Data programme. Furthermore, a scouting of existing datasets available within the GEOSS database will be performed to exploit relevant existing datasets. In parallel, the consortium will coordinate with GEO to find opportunities to contribute to the GEOSS database by publishing selected datasets related to climate change.

**KPI<sub>1</sub>:** Dynamic and interactive map-based visualization of geolocalized data taken from open sources and European initiatives (COPERNICUS, AGRICLASS) **(M18)**

**Expected impact:** *facilitating rapid deployment and market uptake of Climate Services by demonstrating their added value;*

The added value of climate services, as integrated in the VISCA project, will be demonstrated throughout the whole European wine industry value chain. In fact, VISCA will positively affect:

1. Farmers, able to increase the yield of their cultivations by enhancing the productivity of existing cultivations and by exploiting new fields previously unproductive. In 2015, the total world area under

<sup>49</sup> KPI = KEY PERFORMANCE INDICATOR

<sup>50</sup> The EU Strategy on adaptation to climate change [http://ec.europa.eu/clima/publications/docs/eu\\_strategy\\_en.pdf](http://ec.europa.eu/clima/publications/docs/eu_strategy_en.pdf)

<sup>51</sup> F.J Doblas-Reyes *et al.* (2006). Developments in dynamical seasonal forecasting relevant to agricultural management. *Climate Research*, 33, 19-26.



vines (corresponding to the total surface area planted with vines, including that not yet in production or not yet harvested) reached 7,534 kha. EU vineyards<sup>52</sup> should stand at 3,362 kha, a reduction of 26 kha between 2014 and 2015.<sup>53</sup>

2. Downstream operators (chiefly Wine producers and Distributors) benefitting from a timely and guaranteed delivery of grapes due to an improved predictability of yields (in terms of both quantity and quality). In 2015 the global market (considered here as the total exports of all countries) should reach 104.3 mhl in terms of volume – an increase of 1.8% compared with 2014 – and 28.3 bn EUR in terms of value – a rise of 10.6%/2014. In terms of volume, there was a rise in exports from Spain (1.7 mhl). Italy and France exports decrease by around 2%. In terms of value, Italy and France continued to dominate the market with shares of 19% and 29% respectively.<sup>53</sup>
3. Upstream operators (e.g., Fertilizers producers), guaranteeing them a better planning of resources and the possibility of improving their products, being involved in the development and improvement of a cutting edge technological solution.
4. Other stakeholders (e.g., retailers, policy makers, environmental organizations, technological research centers, society as a whole), all interested in the enhancement of the sustainable products for final customers and/or the eco-sustainability of their business.

**KPI<sub>1</sub>:** Business plan completed in draft version by **M24** and in final version by **M36**. Preliminary revenue expectations overcoming €50m per annum from 2028

**KPI<sub>2</sub>:** Deployment of the CS-DSS in a Cloud computing facility within the selected focus areas (**M15**)

**KPI<sub>3</sub>:** Newsletter about the results of demo workshops published on the VISCA web site (**M04-M30**)

**Expected impact:** *providing added-value for the decision-making process addressed by the project, in terms of effectiveness, value creation, optimised opportunities and minimised risks;*

Currently, adaptive responses to climate mostly occur during harvest, such as harvesting at night (lower temperature) by machine, or during winemaking, such as blending wines from different vineyards to maintain quality.<sup>54</sup> Given the wide time frame analyzed by VISCA, one clear benefit is that they ensure the appropriateness of decisions undertaken at all management levels, providing most appropriate medium-term response strategies (interesting for farmers and producers) with long-term management strategies (interesting for downstream/upstream operators, policy makers and long term crop planning for farmers), minimizing environmental and economic costs (improving quality and quantity of grape, reducing irrigation, reducing use of pesticides, etc.). Moreover, information at multi-decadal time scale allows for strategic planning and adaptation decisions at long term.

**Regarding VISCA end-users, their medium-term goal is a 10% quality increase, whereas the long-term (5- 10 years) goal would mean up to a 20 % quality increase** (due to the prestige growth and the real perception of consumers). This increase in the quality may allow for an increase in 4-5M€ benefits (in the case of a large company like CODORNIU). Besides this, **VISCA would allow a one year-in advance production forecast, which would have an immediate impact on wine harvest's value of 2%** (for large industries this may imply 0,5-1 M€ improvement on logistics).

**KPI:** Evaluation of VISCA feasibility according to vineyards quality parameters (**M36**)

**Expected impact of the call:** *increasing the provision of climate services with added value to the end-users;*

The EU-28 remained the world's leading wine exporter in 2014, exporting 2.1 billion liters<sup>55</sup>. Climate change variation such as pattern change of rainy summer, adverse weather conditions during the harvesting period or adverse weather conditions during flowering can lead to a decrease on production of wine-grapes and thus

<sup>52</sup> Vines for wine grapes, table grapes or dried grapes, in production or awaiting production.

<sup>53</sup> <http://www.oiv.int/public/medias/4587/oiv-noteconjmars2016-en.pdf>

<sup>54</sup> [http://ec.europa.eu/environment/integration/research/newsalert/pdf/how\\_policies\\_could\\_help\\_winegrowers\\_adapt\\_to\\_climate\\_change\\_457na1\\_en.pdf](http://ec.europa.eu/environment/integration/research/newsalert/pdf/how_policies_could_help_winegrowers_adapt_to_climate_change_457na1_en.pdf)

<sup>55</sup> [http://gain.fas.usda.gov/Recent%20GAIN%20Publications/Wine%20Annual Rome EU-28 3-16-2015.pdf](http://gain.fas.usda.gov/Recent%20GAIN%20Publications/Wine%20Annual%20Rome%20EU-28%203-16-2015.pdf)

an economic loss (in 2014 a notable decrease in production occurred in Spain (-22.3%), Italy (-15 %) and Portugal (-6 %) due to these climatic variations). In recent years, the traditional producing countries seem to have suffered greater variability in weather events impacting both volume and quality.<sup>56</sup> European wine industry is well aware of this threat, although strategic planning in wine industry has so far included, among other things, geographic shifts in production, i.e. moving upward to higher altitudes, in order to counteract the warmer climate with cooler temperature. However, what it should be more important is the design of adaptation strategies to fight the climate change, in order to allow for a sustainable development of the regions more affected by it. **With a view to make this tool closer to the wine sector, the tool will be demonstrated in the 3 areas to evaluate its performance on vineyards' life cycle and production, to determine how seasonal forecasting can affect both quantity and quality of the final product.** VISCA aims likewise at an evaluation of the replicability potential in other relevant sectors at international level, in order to introduce this climate service to other potential markets, e.g. other sectors of agriculture also sensitive to climate change, like Olive Oil industry, Cereals (in particular rice, since it needs large amount of water), and deforestation (Appropriate organizations are already part of the Advisory Board, such as AEMO, CITOLIVA, DeltaMed, CIHEAM, and the European Environmental Agency).

**KPI<sub>1</sub>:** Secured data services for interfacing the different modul **(M12)**

**KPI<sub>2</sub>:** Average response time of visualization services below 2s and standard deviation below 1s from clients with a broadband connectivity of at least 3 Mbp **(M12)**

**KPI<sub>3</sub>:** Cloud computing deployment of the DSS in order to provide a scalable, reliable, and available service. High service level with 99% of availability (24/7) **(M12)**

**Expected impact of the call:** *fostering market uptake of climate services;*

VISCA is expected to foster the market uptake of climate services by unveiling its added value not only for the wine industry but also in other domains. To cite a few:

1. By changing the model parameters (e.g., Phenological model and Users' requirements) the system can be tailored to almost all types of cultivations;
2. By cherry-picking some components only, VISCA can be adapted to completely different domains, e.g.. (i) emergency management where it can be used to help managing flood events (by integrating the Climatic models into systems such as FLOODIS<sup>57</sup>) or to create "live" risks maps that will consider not only the season and the cultivations, but the exact phase of maturation to pinpoint more precise risks (by exploiting the combined outcomes of the Climatic and the Phenological models); (ii) insurance sector where VISCA could allow an improvement in the overall company's strategy, e.g. better identifying risk areas and defining the linked premium;
3. By adding new elements to VISCA (e.g., Earth Observation data), the system can become a tool able not only to predict productivity, but also able to monitor *in itinere* crop development and therefore to guarantee the possibility to intervene from an operational point of view.

**KPI<sub>1</sub>:** Automatic delivery of climatic, meteorological, phenological and irrigation information to the geospatial database for crop management decisions **(M18)**

**KPI<sub>2</sub>:** Productions of optimum dates to apply crop management strategies, after data processing by the DSS **(M15)**

**Expected impact:** *concrete solutions to overcome barriers hampering deployment of Climate Services in the specific area of application.*

A clear objective of VISCA is the definition of an action plan to tackle barriers and opportunities derived from the full deployment of VISCA on the demo areas (Objective 10, WP4). This will be done during the 3 years of

<sup>56</sup> [https://www.svb.com/uploadedFiles/Content/Blogs/Wine\\_Report/2015\\_Wine\\_Report/wine-report-2015-pdf.pdf](https://www.svb.com/uploadedFiles/Content/Blogs/Wine_Report/2015_Wine_Report/wine-report-2015-pdf.pdf)

<sup>57</sup> [www.floodis.eu](http://www.floodis.eu)

the project lifetime, based on the barriers encountered by all levels of the chain (climate and software suppliers, research entities and end users included in the consortium). A clear example is that climate information has a probabilistic nature, and therefore difficult to be conveyed to crop planning. VISCA has conceived a way to overcome this limitation by producing customized modules co-designed together with the interested end-users.

In addition to the barriers collection by the components of the consortium, VISCA's Advisory Board counts on representatives from wine-related organizations, international organizations that work on Mediterranean agriculture, rice and deforestation, and international environmental associations, in order to provide feedback on the barriers and opportunities of the tool in their particular sector.

**KPI: Submission of Deliverable 4.5 "Main Barriers and Solutions found on the DSS application" (M36)**

## 2.1.2. Impacts on companies, market, climate change, society and environment

### **Other impact 1: Benefit for the companies within the consortium**

The private companies belonging to the Consortium may register different impacts according to their expertise and services provided. In fact, all the VISCA companies will provide specific services for future systems development, e.g., from technological to consultancy services, from marketing to commercial activities, from user involvement to communication actions. These services will be ruled by commercial agreements foreseeing specific fees in relation to the service and efforts put in place, with a related growth of turnover following VISCA success achievement. The expected impacts for Consortium private companies are briefly summarized below:

**COD, MAST, SYM (end-users):** As already explained in the section 2.1.1., in the long term the companies could aspire to a 10% quality increase in the medium term (due to a better crop planning thanks to seasonal and phenological information), while this increase may be doubled in the long term due to prestige growth. If the logistic planning works well with VISCA tool, it would allow a one year-in advance production forecast, which would have an immediate impact on wine harvest's value of 2% (for large industries like COD and SYM this may imply 0,5-1 M€, for smaller companies like MAST may imply 0,2-0,3 M€). See **Figure 12**. VISCA preliminary revenues for Europe.

**MET (meteorological and climate data provider):** First of all, VISCA will allow Meteosim to know real demands of climate services of wine sector, and thus develop a useful tool that, with a proved return of investment, will improve the bottom line of the wine producers. This opportunity will create a specific vertical market to Meteosim that will be expanded in Europe and America, where the company is currently working. During the VISCA execution, Meteosim define how to make the approach to the market. After that, Meteosim will invest on sales force (1 person), marketing and technical resources (2 persons + IT infrastructure) to provide the service. As showed in the Business Plan, in 10 years after the project conclude, it is expected that VISCA will generate 50 M€ of revenue (60 €/ha per year). Making a shorter and more conservative projection, it is expected that for 2019, 2020, 2021, Meteosim will increase its recurrent revenue 0,5M€, 1M€ and 2M€ respectively thanks to VISCA.

**ALPHA (market up-take consultancy):** ALPHA is expected to leverage the information acquired during the project and in the subsequent implementation phases to provide to interested customers a new consultancy service, i.e. "Big Data analysis". In fact, "Big Data" analysis consulting service is expected to boom in the coming years, growing at a rate of c. 50% p.a. in the next 3 years and reaching a worldwide value of c. €7 billion already in 2017, from a value of less than €2 billion at the end of 2014<sup>58</sup>. **ALPHA is eager to exploit this interesting opportunity to expand its business in this promising marketplace.**

**KPI:** Business plan completed in draft version by **M24** and in final version by **M36**. Preliminary revenue expectations overcoming €50m per annum from 2028

<sup>58</sup> Market and Market "Big Data analytics Market Trends" on <http://www.bigdatanews.com/group/bdn-daily-press-releases/forum/topics/market-and-market-releases-big-data-analytics-market-trends-report>



**Other impact 2: Impact on the market: growth potential for farmers and for producers**

The European Union is responsible of 60% of world wine production, making it the world's biggest wine producer<sup>59</sup>. Wine exports outside EU currently account for 15%, internal EU export is 25% and the rest is consumed internally within the producer country.

EU is investing in creating a sustainable wine industry in order to secure the economic wealth of the wine producer region, maintain the current wine production, while being competitive among high quality wine. It is clear that greater awareness of the effects of climate change will benefit the industry at large, especially the design of decisive strategic planning, which can provide individual producers with a comparative advantage over competitors. While most of wine producers are coping with long-term planned adaptation strategies like geographic shifts in production, adjustments to AOC systems (changes in location and grapes types are restricted by the Appellation d'Origine Contrôlée), and marketing strategies to influence consumer demand (Changing grape varieties will change dramatically the content of the wine bottle, and how consumers will react to this is unknown), some experts<sup>60, 61</sup> suggest foresight methods, including scenario analysis and the exploration of climate adaptation wedges as important tools that can help the wine industry in planning for an uncertain future.

On this regard, VISCA is a tool tailored to give well-founded informed decisions so as to be able to design appropriate adaptation strategies to adapt the vines and grapes variety to local climate changes conditions, in order to maintain the wine local economy and make it sustainable, plus maintaining the economic wealth and wine quality of EU.

**KPI<sub>1</sub>:** Development of a Market analysis and competitive assessment included in Deliverable 5.3 "Business Plan for exploitation (Issue 1)" **(M18)**

**KPI<sub>2</sub>:** Organization of a Workshop of VISCA on replicability and policy assessment **(M30)**

**Other impact 3: Impact on society: Food security**

Climate change is inducing a higher frequency of extreme weather events and is responsible for long-term changes on the weather worldwide; Intergovernmental Panel on Climate Change (IPPC) has reported that 22% of overall economic loss caused by extreme events in developing countries is in the agricultural sector<sup>62</sup>, and warns that by 2050 a 10-25% loss in worldwide crop yield may be a fact due to climate change effects. On the other side, food production will need to increase by 60 % by 2050 to meet the needs of the expanding global population.<sup>63</sup> Due to the latter, adaptation strategies in agriculture have become critical for the survival of regional crops at longer, and even medium term<sup>64</sup>. In fact, the UN Food and Agriculture Organisation (FAO) estimates that total agricultural production necessary to feed the world population will require a 60% increase, whereas climate change is already negatively affecting agricultural production<sup>65</sup>.

VISCA is introducing a new concept by providing guidelines on how to adapt current crops lifecycle to new climatic conditions, which has 2 major advantages: (i) increasing yield and quality of the local crop, and (ii) local farmers will be able to keep their agriculture cultures and traditions, therefore minimizing the negative economic impact in the region, therefore avoiding local population emigration.

**KPI:** Presenting the project in 4 relevant events related to sustainable agriculture and food security, including 2 agrotechnic industrial sectors where VISCA could replicate **(M36)**

<sup>59</sup> [http://ec.europa.eu/agriculture/wine/statistics/market-situation-2014-07\\_en.pdf](http://ec.europa.eu/agriculture/wine/statistics/market-situation-2014-07_en.pdf)

<sup>60</sup> Rounsevell M D A and Metzger M J (2010). Developing qualitative scenario storylines for environmental change assessment. *Wiley Interdisciplinary Reviews: Climate Change* 1 606–19

<sup>61</sup> Diffenbaugh N S, White M A, Jones G V and Ashfaq M (2011). Climate adaptation wedges: a case study of premium wine in the western United States. *Environ. Res. Lett.* 6 024024

<sup>62</sup> <http://www.ipcc.ch/>

<sup>63</sup> <http://www.fao.org/3/a-i5165e.pdf>

<sup>64</sup> Elbehri, A. (2015). Climate change and food systems: global assessments and implications for food security and trade. Ed. FAO

<sup>65</sup> <https://ccafs.cgiar.org/climate-smart-agriculture-0#.VsWZifLhCUk>

### 2.1.3. Description of Barriers and Obstacles to overcome

**Table 5. Barriers/obstacles that may determine whether expected impacts will be achieved.**

Barriers	Proposed measures to overcome it
<i>Water needs given by the tool according to irrigation models, to achieve a high quality product, is incompatible with green economy / sustainable growth principles</i>	End-user requirement will limit the amount of water to be used per year taking into account the available irrigation water and the EU Water Framework Directive basics.
<i>Lack of simplicity and usability of the tool to be adopted by large industry and small producer</i>	The tool will be user-friendly, since it will be co-designed together with the end- users, to be subsequently tested on the field.
<i>The decision-making process offered by the tool doesn't prove to be effective, optimize productivity or minimize risks (added value of the tool)</i>	Calibration and monitoring of the tool during the whole project. End-users will be involved from the beginning of the project, in particular for validation and calibration of the DSS, with preliminary versions provided to the demo-site sufficiently in advance in order to adapt the tool.
<i>There are not available phenological models for all crops, therefore not extrapolable to all markets</i>	If this is the case, some of the different research teams that cooperate with the end-users of this project will have already the basic knowledge and the interest to develop it.
<i>The climatic change introduces noises on the already developed phenological crop models, which made difficult to use them on the final assessing tool.</i>	The models are tested for many different locations, weather conditions, and hemispheres in order to avoid such problems. However, recognizing that this possibility may exist in the future, there is a general warning explaining that models should be continuously tested and checked.
<i>Adaptation strategies resulting from the policy framework at local, national or international level cannot be implemented.</i>	A dedicated risk analysis considering both economic and non-economic risks for market uptake (undertaken in WP5), coupled with a continuous involvement of main users and stakeholders, such as policy makers, will avoid a mismatch between regulatory framework and solutions/ strategies developed during the project
<i>A fragmented market (in particular in Europe), with a conservative attitude towards innovation</i>	As starting point for the exploitation strategy, VISCA will focus on prestige and premium wines (instead of basic ones). In these segments, few key players are registered, with a higher willingness to pay and a more positive attitude towards innovation
<i>Price elasticity</i>	Visca solution aims at keeping as low as possible the cost of required equipment, also moving from CAPEX to OPEX
<i>Slow adoption of new systems and technologies in wine industry</i>	The presence in the Consortium of primary industry players (representing some of the key European geographies in terms of wine production and consumption) will be a key lever for market uptake in this industry. Moreover, the ambition of the VISCA project is to exploit the solution not only in the wine industry, but also in other sectors within and outside the agriculture domain.

As mentioned above, a dedicated risk analysis will be undertaken in WP5, task 5.4. It will map the main economic and non-economic risks linked to VISCA uptake and commercialisation (while risks related to the project activities and goals will be analysed in WP1). It will also report main actions to avoid/ mitigate the identified risk

## 2.2. Measures to maximize impact

In this section, the dissemination, exploitation, and communication activities are discussed. An important distinction will be made with respect to the different approaches to maximize impact, according to Grant Agreement Article 38.1. Indeed, through the actions outlined in the present proposal VISCA will “promote the innovation action and its results” through three distinct but complementary approaches:

- **Dissemination strategy** and actions which will disclose and give public access to the results of the project. It will define the strategy of the project to communicate with the target audiences throughout the duration of the project through identifying the objectives, target audience, key messages, channels and promotional materials. It will be focused on different types of audiences, given the relevance of the market, and the general interest on the exploitation of climate services (e.g. farmers, policy makers, scientific community).
- **Exploitation**, given the high TRL level to be achieved and the strong innovation potential of the VISCA solution, coupled with a predominant presence of innovative SMEs within the consortium, a preliminary business plan together with a business model and a market assessment are included as exploitation strategies.
- **Communication activities** aim to raise awareness and support dissemination and exploitation by providing unique and uniform visual identity and media tools and channels. VISCA will have a special focus **on end-user's engagement and stakeholder's involvement** during the overall project duration, starting from the definition of needs that will lead to the requirement definition.

Target audiences will be identified after an accurate analysis and will be prioritized according to their influence and interest in the project. The stakeholder clusters relevant to the consortium will be regularly monitored and reviewed in order to make necessary adjustments. In this way, responsiveness in terms of policy and legislation changes and/or scientific and technological innovations will be achieved. Also, a database of the targets' contacts will be set in order to contact them when needed. The main categories of the target audience of VISCA project are:

- **Farmers** of vineyards and related crops such as olives as well as irrigation & agricultural communities.
- **Wine producers** (downstream operators).
- **Wine distributors**.
- **Upstream operators** (e.g. fertilizers producers)
- **Retailers**
- **Policy-makers** such as ministries of agriculture and EC bodies
- Environmental organizations
- **Scientific community** such as scientists, universities and educational & training organizations
- **Society as a whole**.

In order to promote the technology, activities, progress and results of VISCA project to relevant stakeholders and to engage them with the project effectively, a strategy of dissemination and exploitation actions needs to be implemented.

### 2.2.1. Dissemination of results

Dissemination activities will be undertaken as a part of an overall strategy created by SEMIDE; it will likewise organise all communication activities to be carried out for the entire duration of the project. A preliminary dissemination plan, part of a bigger document called **Communication and Dissemination Plan** (CDP, WP5), will be delivered at the early stage of the project (M06) after discussing its contents during the kick-off meeting, in the dedicated session of WP5. Furthermore, the CDP will briefly present some recommendations on communication activities to be done after the end of the project. The CDP will be supportive to the business plan where the latter is focused on the exploitation actions. The dissemination plan will define the following points:

#### Dissemination objectives

- Ensuring that the project objectives, activities and outcomes reach the relevant target groups, especially end-users, in and beyond the demo site countries.
- Facilitating the market deployment and exploitation of VISCA Solution in South-European wine industries as well as internationally with other relevant sectors (e.g. high value agricultural production such as olives oil).
- Involving European policy-making and policy-supporting institutions.
- Ensuring transparency and visibility of the project activities to acquire the needed support from crucial stakeholders.

## Key messages

Key messages will be tailored according to the type of stakeholder. The key messages will be integrated in all communication materials and activities and reviewed with the project results during the implementation.

**Table 6. Key messages according to Stakeholders**

Stakeholder	Key messages
Farmers	VISCA is a smart climate application which suggests crop management strategies that enhances the quality, productivity and value of wine harvest.
Wine producers and Wine distributors	VISCA offers a timely and guaranteed delivery of grapes due to an improved predictability of yields (in both quantity and quality).
Upstream operators and retailers	VISCA guarantees a better planning of resources through the provision of online forecasting information at different geographical scale.
Policy makers	<ul style="list-style-type: none"><li>– VISCA support Climate Adaption for the agricultural sector, starting with the wine segment</li><li>– VISCA contributes to maintaining the high profile of the European Wine industry and limit its climate vulnerability</li><li>– VISCA contribute to the development of European leadership in the provision of Climate services.</li></ul>
Environmental organisations	<ul style="list-style-type: none"><li>– VISCA is improving knowledge and prediction on climate change impacts in the agricultural sector.</li><li>– Beyond the agricultural sector, VISCA tools can provide suitable solutions to mitigate the impact of extreme events on the environment in particular for forestry management (e.g. fire vulnerability)</li></ul>
Scientific community	<ul style="list-style-type: none"><li>– VISCA provides new datasets as well as irrigation and phenology models validation that will support further research for growing grapes</li><li>– VISCA is creating business opportunities for the technological, consultancy and marketing companies in the Climate application and services sector.</li></ul>
Society as a whole	<ul style="list-style-type: none"><li>– European Union is supporting the transfer of research to innovation with real life projects for a better European competitiveness and adaptation to climate change.</li><li>– VISCA is enhancing the life standard of European citizens by providing climate-related tools to improve the quality and productivity of wine harvesting.</li></ul>

## Dissemination channels<sup>66</sup>

Dissemination channels are the tools used to spread the key messages of the project to the target audience; they define 'how' the project will be communicated. These tools will ensure a two-way communication approach and they will include:

- **VISCA official website social media.**  
VISCA official website will present general information on the project: its objectives, the consortium, news, calendar of events, publications (e.g. promotional materials, articles, public deliverables) and press releases as well as contact information. It will also have links to VISCA pages on the social media (Facebook and LinkedIn) where the project news will be constantly published.
- **Participation in dedicated events.**  
VISCA consortium will participate at dedicated events on wine industry and sustainable agriculture such as conferences, exhibitions, workshops and seminars at national, EU and international levels. A primary list of events will be identified in the CDP which will be constantly updated (see section 2.2.3 for more information).
- **Organisation of workshops.**  
VISCA project will organise two workshops targeting irrigation communities, vineyards companies, advisory board members, policy makers, legislations bodies, etc.

<sup>66</sup> Details on 'Dissemination channels' is found in part B Communication activities

- **Online and printed magazines.**

Publishing articles on the activities and achievement of VISCA project and VISCA's tool added value will be published indifferent magazines focused on wine harvesting and sustainable agriculture.

#### **Communication materials<sup>67</sup>**

Communication materials will include brochures, posters and rollups, press releases, newsletters and two videos. The interaction of the target audience and VISCA consortium will be frequently performed through certain channels ensuring a two-way communication approach:

**Table 7. Communication materials to be used in VISCA**

<b>Target Audience</b>	<b>Channels and materials</b>	<b>Frequency</b>	<b>Reach</b>
Farmers	Events	3/year	Global
	One-to-one meetings	2/year	Local
	Workshops	2	Regional
	VISCA website	-	Global
	Printed and online wine and agricultural magazines	2/year	Global and national
	Brochures, posters, rollups, factsheets, case studies and press releases	Throughout the project	Global, national and local
	Newsletters	2	Global
	Video	1	Global
Wine producers and Wine distributors	Events	3/year	Global
	Workshops	2s	Regional
	VISCA website	-	Global
	Printed and online wine magazines	2/year	Global and national
	Brochures, posters, rollups, factsheets, case studies and press releases	Throughout the project	Global, national and local
	Newsletters	2	Global
	Video	1	Global
Upstream operators and retailers	Events	1/year	Global
	VISCA website	-	Global
	Printed and online wine magazines	2/year	Global and national
	Brochures, posters, rollups, factsheets, case studies and press releases	Throughout the project	Global, national and local
	Newsletters	2	Global
	Video	1	Global
Policy makers	Events	1/year	Global
	VISCA website	-	Global
	Printed and online EU policy-related magazines	1/year	Global and national
	Brochures, posters, rollups, case studies and press releases	Throughout the project	Global, national and local
	Newsletters	2	Global
	Video	1	Global
Environmental organisations	VISCA website and social media	-	Global
	Printed and online magazines	2/year	Global and national
	Brochures, posters, rollups, factsheets, case studies and press releases	Throughout the project	Global, national and local
	Newsletters	2	Global
	Video	1	Global
Scientific community	Events	2/year	Global
	VISCA website	-	Global

<sup>67</sup> Details on 'Dissemination materials' is found in part 2.1.3 Communication activities



Target Audience	Channels and materials	Frequency	Reach
	Printed and online scientific magazines	2/year	Global and national
	Brochures, posters, rollups, factsheets, case studies and press releases	Throughout the project	Global, national and local
	Newsletters	2	Global
	Video	1	Global
Society as a whole	VISCA website and social media	-	Global
	Brochures, posters, rollups, and press releases	Throughout the project	Global, national and local
	Video	1	Global

### 2.2.1.1. *How the proposed methods will help to achieve the expected impact of the project*



DISSEMINATION METHODS	<ul style="list-style-type: none"> <li>Participation in vineyards and climate adaptation events</li> <li>Inviting farmers to VISCA workshops</li> <li>One-to-one meetings</li> <li>Online channels: VISCA official website social media, Advisory Board members' network, and online platforms</li> <li>Communication: magazines, multimedia and other printed materials</li> </ul>	<ul style="list-style-type: none"> <li>Participation to events on wine industry</li> <li>Inviting them to VISCA workshops and other similar workshops demonstrate the added value of VISCA from a market point of view</li> <li>Online channels: VISCA official website social media, Advisory Board members' network, and online platforms</li> <li>Communication: magazines and other printed materials</li> </ul>	<ul style="list-style-type: none"> <li>Participation to on EU innovative projects and their application and influence on EU policies.</li> <li>Online channels and showing the role of policies on climate adaptation for food security.</li> <li>Communication: magazines, multimedia and printed materials</li> <li>Inviting policy-makers to VISCA final conference.</li> </ul>	<ul style="list-style-type: none"> <li>Participation in events dedicated to technological solution to climate adaptation for agriculture.</li> <li>Publishing articles in scientific magazines and platforms.</li> <li>Reaching through Online channels: VISCA official website and VISCA's research partner's network.</li> </ul>	<ul style="list-style-type: none"> <li>Reaching them through Online channels: VISCA official website social media, Advisory Board members' network, and online platforms</li> <li>Communicating with them via multimedia (video) printed materials (brochures, posters)</li> </ul>
EXPECTED IMPACTS	<ol style="list-style-type: none"> <li>Facilitating rapid deployment and market uptake of Climate Services by demonstrating their added value;</li> <li>Providing added-value for the decision-making process addressed by the project, in terms of effectiveness, value creation, optimised opportunities and minimised risks;</li> <li>Concrete solutions to overcome barriers hampering deployment of Climate Services in the specific area of application;</li> </ol> <p><b>Other impacts:</b></p> <ol style="list-style-type: none"> <li>Benefit for the companies within the consortium;</li> <li>Impact on the market: growth potential for farmers and for producers;</li> <li>Impact on society: Food security;</li> <li>Impact on climate change: Design/Adoption of adaptation strategies;</li> </ol>				

In order to maximize the expected impacts of the project, some dissemination methods are going to be performed according to the target audience listed in the table above.

### 2.2.1.2. *Management of generated information*

#### Knowledge Management Strategy and IPR

VISCA project results are foreseen to generate new products and knowledge (datasets, services and software). Thus, specific measures will be applied by the partners to ensure the effective protection and the management of Intellectual Property Rights (IPR) issues. The table below gives an overview of the main types of data, services or software collected or generated by VISCA:

Type of data/ service/ software	Details	Standards	Availability / exploitation
Seasonal climatic forecast predictions	Based on North American Multi-Model Ensemble and Copernicus Climate Change datasets	INSPIRE conform metadata	North American Multi-Model Ensemble Yes. Copernicus Climate Change not yet available.
Real time short-term meteorological forecast data	Precipitation, temperature, relative humidity	INSPIRE conform metadata	Made available to authorized users via VISCA DSS and mobile app
Long term historical and projection interlinked data sets for specific grapes	Based on CMIP5: temperature and precipitation	INSPIRE conform metadata	open access through VISCA web site and COPERNICUS
Irrigation models improved through VISCA	Based on VSIM model as well as in situ orchard, soil and weather data on orchard and soil	INSPIRE conform metadata	open access through VISCA web site
Phenological models improved through VISCA	Based on historical research data repository	INSPIRE conform metadata	open access through VISCA web site
DSS and mobile application		OGC standards for maps visualization	Made available to authorized users (initially free-of-charge)
In situ data / ground information / End user requirements	INSPIRE conform metadata	INSPIRE conform metadata	Made available to authorized users in case that the permission is given by the owners of the information

VISCA is designed to advance the state-of-the-art in several domains, including weather forecasts, hazard now casting and forecasting, data management and data analytics, which are areas where significant findings subject to intellectual property protection are expected to be generated. Thus, there is a strong need to manage IPR issues and the innovations that will result. VISCA will rely upon open standards for representing and processing multilingual and semantic data to assure interoperability, sustainability, and broad uptake across industries and countries. Where possible, data will be shared and thus made accessible for its reuse. Some data will not be published due to its confidentiality and IPR protection by businesses that consider their data as branding assets. We will use a standardized approach to data curation and storage based on Open and Linked Data standards. SEM will take the supervision of this activity as follows:

<b>Intellectual Property (IP) Identification</b>	Definition of VISCA's results that might have a potential Commercial value. Identify any IP that can be protected and/or exploited.
<b>IP Protection</b>	Obtaining IP protection of the defined potential IP results. Assistance to partners in fulfilling obligations and responsibilities as well as rewarding and encouraging participation in any subsequent commercialization process.
<b>IP Ownership</b>	Clear identification and definition of what partners will claim any ownership and/or associated rights for IP generated from their VISCA's research. Review policies and relevant procedures for determining the subsequent ownership and/or assignment of IP rights. Clear agreements with employees and grant holders registered through the consortium on ownership and/or associated rights of IP.
<b>Existing IP Assessment</b>	Guide participants in assessing the existing IP in the field that it is likely to affect their research in order to determine their freedom to operate.
<b>File for IPR protection</b>	Such decisions will be made with respect to the legitimate interests of the partner(s) owning the corresponding IPR and the legitimate interests, particularly the commercial interests, of other partners.

<b>Applications for IPR protection</b>	The best IPR protection preparation and filing strategy will be defined and the respective documents will be prepared. Advices regarding how to prepare a robust set of claims and how to maximize the value of the IPR protection sought will be given.
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A Consortium Agreement will be signed by all partners in order to establish the framework for cooperation in the VISCA project, in particular to specify among the parties the ownership of results and intellectual properties, access rights, rights and roles for exploitation, non-disclosure and confidentiality of information and software. The latest version of the DESCA Horizon 2020 template Consortium Agreement will be adapted to need of VISCA consortium.

### Data Management Plan

VISCA data will be easily accessible and interoperable according to international standards. The project intends, as much as possible, to participate to the Open Research Data Pilot (ORDP) initiated in H2020. A Data Management Plan (DMP) will be released within WP1 – Management of the consortium, D1.3, at M06. It will provide information of the data types of the ORDP for the datasets acquired and generated during the project. The DMP will define metadata standards for the geo-information and data according to the EU INSPIRE directive, and will pre-define the work flow for the data processing, storage, and access of all data used and products generated within the project.

The afore mentioned DMP will be defined and implemented in order to ensure a high level of data quality and accessibility for final users and stakeholders, and to allow the application of data analytics techniques. This approach is particularly relevant when dealing with huge quantity of data (Big Data) as is in the case of VISCA. VISCA aims at collecting and processing multiple types of data from different and heterogeneous sources leveraging the paradigms of Open, Linked and Big Data management. Specifically, the DMP will address the following main aspects:

- **Collected and the delivered datasets:** this part will describe datasets reference and naming rules, the main characteristics of the data, their provenance, their set scope and goal for the project
- **Data standards:** it will specify the protocols used for data exchange within the VISCA system, and between the VISCA system and the external world (as required for WP3 Climate Service and Mobile application).
- **Metadata content and format:** Metadata are commonly used to describe data, maps and services, to facilitate access and harvesting in global catalogues. It will describe which metadata will be used within VISCA while being compliant with INSPIRE recommendations.
- **Data sharing:** this section describes the policies used to share data among partners and non-partners of the project. Particular emphasis will be given to privacy issue for those data that cannot be delivered as open access data. It will also provide the standard for web application integration and web mapping services (OGC and INSPIRE compliant), and product dissemination.
- **Archiving and preservation (including storage and backup):** this section will describe the standard techniques that will be used to store and preserve both collected and generated data in order to allow the exploitation of the data also after the end of the project.

The management of personal data will be limited to user accounts for the DSS and mobile application. Some personal data might be collected for dissemination purpose. In these cases, to foster data security and privacy issues, VISCA will take into account the EU directives related to both users' rights relating to electronic communications networks and services, and to the processing of personal data and the protection of privacy in the electronic communications sector. The EU directives are the 2009/136/EC and the 95/46/EC, also known as the Data Protection Directive. Any changes in the legislation will have an effect on the ongoing research/project, regardless of the date of the legislation compared with the starting date of the research.

### Publication of results

The consortium members plan to publish research results in scientific journals following the open access “gold” model. This implies that publications shall be stored on established scientific repositories and ensure open access to the deposited publications to reach the broadest possible audience for the results within a short space of time in order to maximize the impact of the project also on the scientific community and the public sector.



The procedure for publications with prior consultation of all partners will be further described in the Consortium Agreement. VISCA website will have a page containing an overview and archive of all published information (scientific articles, publications, press releases, conference papers, etc.) available for downloading.

### 2.2.2. Exploitation

In terms of exploitation, VISCA has a worldwide market potential. First of all, the threat of climate change for the wine production is a global and increasing phenomenon, with strong risks in particular, but not only in Southern Europe, as previously explained in this proposal. The cost to business and economies will be substantial as extreme weather patterns become more frequent. **VISCA** provides the **technologies for improving production management** (quality and quantity of final product), making the overall wine industry even more resilient to climate change. Second, there could be further business opportunities for VISCA, briefly mentioned in Sec.2.2.2.1.3. The most relevant ones will be further assessed and analysed in detail during the project in the dedicated WP5 “Dissemination and Exploitation”. Here, the following business analysis takes into consideration the primary potential end-users and customers, focusing on the main addressable markets for VISCA solution, i.e. the **European and worldwide wine industry**. In particular, key to a successful uptake of the VISCA solution is a targeted business plan that is preliminary defined in this section. It builds upon an initial market assessment and business model, as detailed next (see Sec.2.2.2.1).

#### 2.2.2.1. Business plan outline

The relevance of **European wine industry** is confirmed by different reports and market analysis, looking, for example, at the product segmentation (i.e. still, sparkling or liquor wine). The observation of statistical data<sup>68</sup> in 2014 has shown that the competition arena practically only concerned still wines, as for other products (sparkling wines and liquor wines) Europe operated in a quasi-monopolistic regime (over 90% market share) both on domestic markets and on export markets. With regard to these two types of wine, market competition only involved European countries. However, the situation is changing and this preponderance is now partially undermined by:

- The growing market share of worldwide competitors, such as the New World Countries (e.g. Australia, South Africa, New Zealand, Chile, Argentina, the U.S and Canada) and Eastern Countries (in particular China and India);
- The slowdown of production in Europe mainly due to the falling production of grapes in this region<sup>69</sup>.

Actually, in addition to competition, environmental problems seem to add to market difficulties for the worldwide industry. **Climate change** and the resulting irrigation difficulties would prevent new planting and impact current productions. As the producer of **45% of the wine global total** and considering that wine sector is worth **€5 billion annually** in the Region, this is an important issue and **global challenge for Europe** (especially as production is picking up elsewhere, as previously mentioned). The falling production of grapes in Europe is the primary driver for the decline of the market. Adverse weather conditions in the region are affecting the production of grapes, which is the major component of wines. This issue is strengthened by forecasts, considering that the wine market here is expected to witness a decline at a rate of around 0.62% during 2015-2019<sup>70</sup>.

Starting from this scenario, VISCA was thought and its main features conceived to respond mainly (but not only) to the key wine industry needs and, on the other hand, to be exploited by several public and private users. Considering **VISCA two components** (see also 1.1), namely the Climate Service-Decision Support System (CS-DSS) and the Mobile Application (MA), the solution aims at targeting first of all the wine industry. So, a preliminary market overview on this industry is provided here below.

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<sup>68</sup> Study on the competitiveness of European wines, Final Report, October 2014, COGEA srl

<sup>69</sup> <http://www.euractiv.com/section/agriculture-food/news/climate-change-threatens-european-wine-production/>

<sup>70</sup> [http://www.researchandmarkets.com/research/s98vg3/wine\\_market\\_in](http://www.researchandmarkets.com/research/s98vg3/wine_market_in)

### 2.2.2.1.1. Market assessment

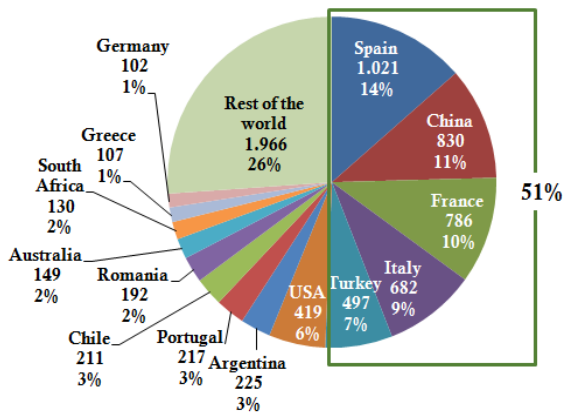


Figure 7. Area under vines (2015; kha)

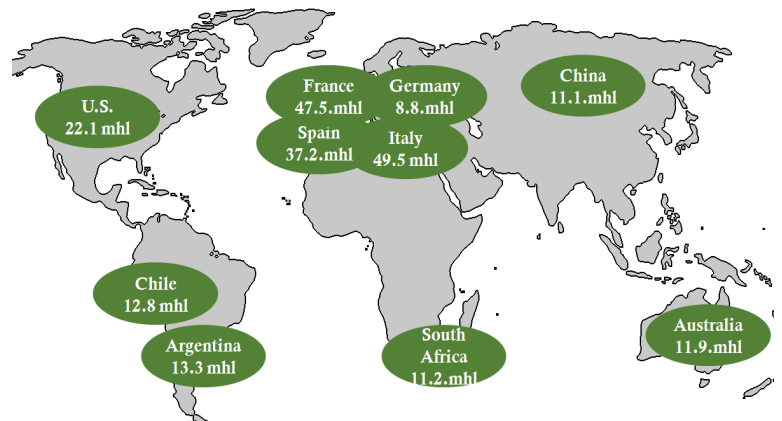


Figure 8. Wine production by main countries (2015; mhl)

#### Area under vines

The size of the global area under vines rose to **7,534 kha** in 2015, revealing a slight decline of 7,000 hectares. In particular EU vineyards (c. 3,362 kha in 2015) continued to decrease slightly (-26kha between 2014 and 2015). Five countries represent the 51% of the worldwide vineyards surface, with Spain as a clear leader.

#### Wine production

Worldwide wine production was relatively strong in 2015. It increased by 2.2% compared to the previous year, reaching **274.4 mhl in 2015** (+5.8 mhl in relation to 2014). The largest wine producers in the world are Italy, France and Spain, with namely 49.5, 47.5 and 37.2 mhl in 2015 (c. 47% of world wine production). However, NWCs are constantly increasing their production.

#### Wine consumption

The global wine consumption has stabilised since the 2008 economic crisis: it is estimated at **240 mhl** for 2015, corresponding to a slight growth (+0.9 mhl) compared to the previous year. Europe still accounts for 50% of wine consumption worldwide, even if it is significantly decreasing in recent years, while U.S. is the largest wine consuming country (with 31 mhl in 2015).

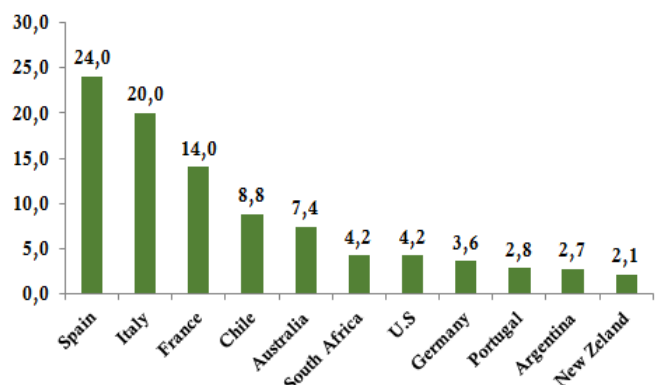


Figure 9. Export by main countries (2015; mhl)

#### International Trade

In 2015, the world wine trade increased **by 1.8 % in terms of volume** (104.3 mhl) yet particularly in terms of **value with a growth of 10.6% (€28.3 bn)** compared with 2014. Exports have doubled over the past 20 years, with Europe (and mainly Spain, France and Italy) as the global leader, exporting 56% of its annual production.

#### Market segmentation

Main industry segments (according to the end-users involved in the project) are: (i) **basic wines**, a segment that is growing thanks to the improvement of quality and due to the crisis that brings to choose cheapest wines; (ii) **prestige wines** that maintain over time a high quality/ cost relationship; (iii) **premium wines**, characterised by low volumes and selected markets; and (iiii) **icon wines**, so very high quality wines and representing a niche in the market.

#### EU/ global challenge

Climate changes will continue to have negative effects on the whole life cycle of wine production, especially on prestige and premium wines. According to some 2013 simulations of the National Academy of Sciences<sup>71</sup>, the

<sup>71</sup> <http://nca2014.globalchange.gov/report/our-changing-climate/observed-change>

most drastic decline is expected in Europe in 2050, where the scientists found a **85% decrease in production** in particular for Bordeaux, Rhone and Tuscany. Impacts are foreseen also in California and Chile.

#### 2.2.2.1.2. *Users, customers, stakeholders and their needs*

Within this domain, VISCA could bring significant benefits to a wide spectrum of users (U), customers (C) and other stakeholders (S) in the whole value chain, as detailed in the following table.

**Table 8: VISCA user, customer and stakeholders and their main needs**

Actor	Description	Type of actor		Type of involvement			Main needs
		U/ C	S	Use	Pay	Gain	
<b>Farmers</b>	Grape growers	√		√	√	√	Increase the yield of cultivations by enhancing the productivity and by exploiting new fields previously unproductive
<b>Wine producers</b>	Cooperatives, winemakers and private wineries	√		√	√	√	A timely and guaranteed delivery of grapes due to an improved predictability of yields
<b>Distributors</b>	Wholesalers, merchant traders and auctions		√			√	
<b>Upstream operators</b>	Fertilizer producers		√			√	A better planning of resources and the possibility of improving their products
<b>Retailers</b>	Foodservices, supermarkets and specialty shops		√			√	An enhanced offer of products for final customers
<b>Policy makers</b>	Regulators at national, regional and international level		√			√	An increase in the eco-sustainability of the business and the introduction of new technologies in the domain
<b>Environmental organizations</b>	NGOs and associations focused on environmental aspects in agriculture domain		√			√	
<b>Overall scientific community</b>	Technological Research Centers/ Universities		√			√	
<b>Society as a whole</b>	Citizens		√			√	

As the table above shows, VISCA can have two main user groups in the wine industry., i.e. **grape growers/vineyards and wine producers**.

This is a market quite **vast and fragmented, in particular in EU** where the average vineyard area per holding is thus about **1.5 hectares**. In particular, it is represented by a high number of farmers, but also cooperatives, wine makers and private wineries producing wine in this region. A lower level of fragmentation is registered in rest of the world, such as for example, in U.S., New Zealand, Australia or South Africa. In fact, here, both holdings with vineyards and wine producers are bigger and the average vineyard area per holding higher.

Despite this vast market, moving to the **competitive environment**, **no similar solutions** seem to be already present at this stage of the analysis, and in particular:

- Only some **projects** aimed at developing solutions with some similarities with VISCA were identified (e.g. Innovine or Vinbot), however none of the identified projects/ solutions foresee seasonal forecasting or integrate phenological models, unlike VISCA;
- **Key actors** in agriculture domain and potential VISCA competitors, such as in case of **Hyds** (Spain)<sup>72</sup>, **Meteogrid** (Spain)<sup>73</sup>, **Meteogroup** (Spain)<sup>74</sup>, **Meso con Skybit** (U.S.)<sup>75</sup> and **The Climate Corporation** (U.S.)<sup>76</sup> offer advanced systems, mainly in terms of short-term forecasting weather data and some of them tailored for agricultural services. However, they do not yet provide comparable solutions to VISCA, also in this case mainly looking at seasonal forecasting or phenological models.

In conclusion, VISCA has a huge innovation potential. This explains a **price tag** in line with **advanced existing solutions in these markets**. However, considering the extent of market potential, the pricing strategy will be customised on final users, their needs, their willingness to pay and the industry elasticity. In line with this approach, a first validation of pricing strategy has been conducted with the involved users during the proposal preparation (thanks to ad-hoc interviews to Codorniu S.A, Symington, Mastroberardino spa and Vinhos S.A.). They confirm the innovation potential of the solution (nothing equal exists in their countries) and the appropriateness of the preliminary pricing strategy. All in all, the pricing will be related to the approach used to deliver the solution to the final users.

#### 2.2.2.1.3. Business Model

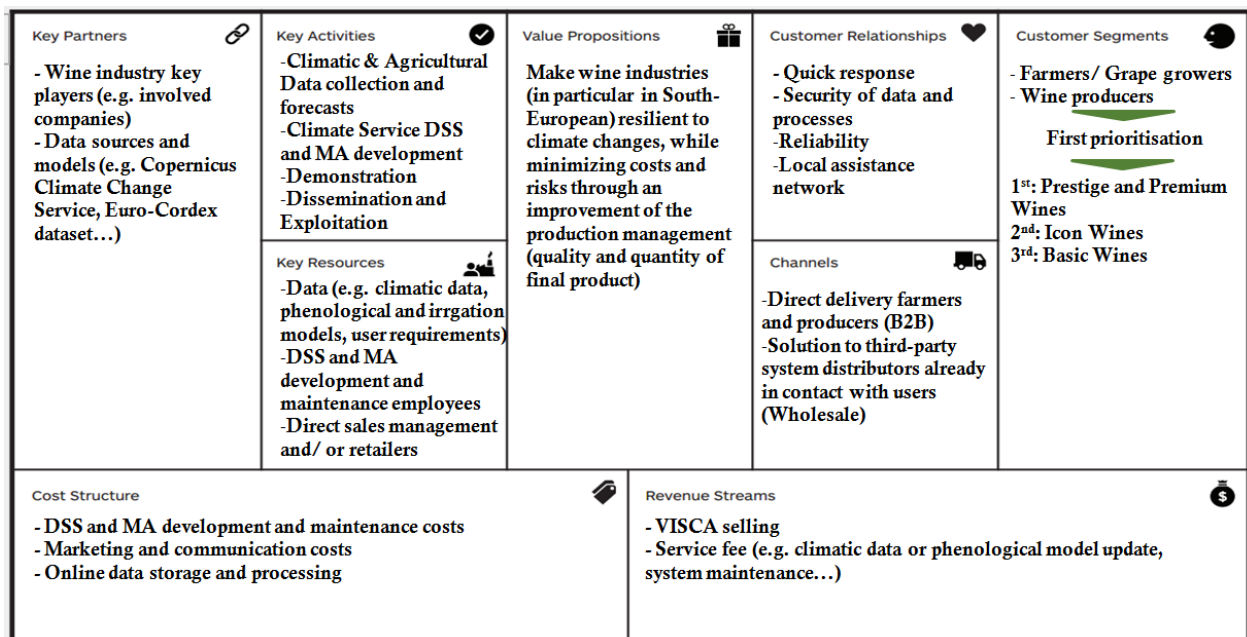


Figure 10. Preliminary Canvas business model for Visca solution

As the “channels” box shows in the Canvas model, to provide the solution to different users, two preliminary approaches are identified. VISCA solution may be commercialized in the future exploiting either a **B2B** or a **Wholesale** approach.

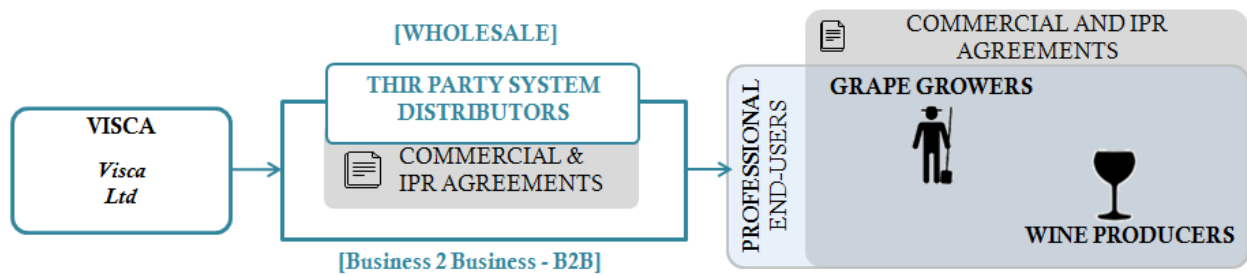
<sup>72</sup> <http://www.hyds.es/index.aspx>

<sup>73</sup> <http://www.meteogrid.com/servicios/agricultura/>

<sup>74</sup> <http://www.meteogroup.com/es/es/sectores/agricultura/perspectiva-general.html>

<sup>75</sup> <http://www.meteogroup.com/es/es/sectores/agricultura/perspectiva-general.html>

<sup>76</sup> <http://www.meteogroup.com/es/es/sectores/agricultura/perspectiva-general.html>



**Figure 11. VISCA distribution approach**

The figure above represents the two main distributing channels foreseen, with VISCA acting as:

- **Content and service provider** of VISCA solution directly to end-users (“B2B”);
- **Content provider** and provision of VISCA solution to third-party system distributors already in contact with users (“Wholesale”).

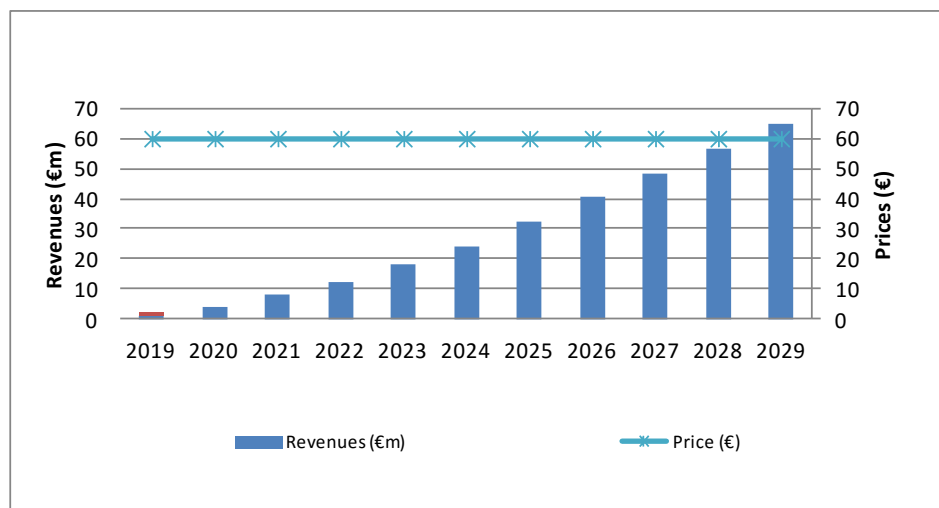
In all cases, the relation between VISCA and end-users should be ruled by commercial and IPR agreements, protecting the developed solution. This is quite relevant, especially for the second approach.

In both these approaches, the Consortium plays a key role in terms of solution provisioning to the market, due to the consolidated market share and commercial experience in particular of its SMEs. The approach adopted will clearly influence the Consortium Business Plan (BP).

#### 2.2.2.1.4. Preliminary business plan

At this first stage of our solution development, we will adopt the B2B approach (i.e. VISCA solution is provided directly to end-users) to preliminary estimate the impact of the solution for the Consortium, quantifying the potential revenues in 10 years. On the contrary, other business opportunities generated by VISCA, has been considered only from a qualitative point of view.

The preliminary business plan (2019-2029) was based on some key assumptions. Europe has been considered as the first market for solution penetration, even if we will foresee a worldwide penetration during the project execution. Moreover, a penetration reaching up to 32% in 10 years and a preliminary pricing strategy per hectare has been defined, both with the support of the involved potential users and their market knowledge. These assumptions will be reviewed during the project to validate user availability to pay.



**Figure 12. VISCA preliminary revenues for Europe**

Assuming a market price of c. **€60 per hectare** (for both the VISCA system and service) and EU vineyards c. 3,362 kha (see also 2.2.2.1), about **€4 million** can be expected still in the second year (i.e. 2020) and only for Europe. In the next years of activity (up to 2029), the Consortium expects to propose VISCA to all relevant users within Europe, exploiting direct contacts as well as institutional support (see **Table 10**) and dissemination/ awareness activities. It is assumed that, having proved the benefit of the solution, final revenues of more than **€50m per annum from 2028** will be reached.

#### 2.2.2.1.5. Other business opportunities

Results coming from the preliminary business plans can be considered conservative. In fact, they do not consider the possibility to exploit the solution outside Europe and wine industry. In particular:

- A **worldwide market** in wine industry for VISCA exists;
- In **agriculture domain**: VISCA could be leveraged also for **other types of cultivations** or **sectors** impacted by climate change (e.g. olive, cereals, forestry...).
- Outside **agriculture domain**: VISCA will produce single datasets and services that could have a potential for becoming innovative products also outside agriculture domain, such as (to mention some examples):
  - In flood and fire **emergency management**, where climatic models can be integrated in existing systems; or
  - In **insurance sector**, requiring operational solutions to identify most risky areas and quantify the degree of impact to fix their premiums and to alert their customers in case of risks, e.g. towards insured cultivations.

#### 2.2.3. Communication activities

Communication activities will be carried out and monitored through a number of planned activities and instruments proportionate to the scale of the project and tailored to the target audience, they will include:

- **Creating VISCA website**, implemented by SEMIDE, it will be established within four months with an appropriate protocol for updating information on activities and progresses of the project. It will include general information on the project, the consortium, news, calendar of events, publications and press releases as well as contact information. The website will consist of two parts; the public area of the website will be mainly directed to the irrigation communities, winery industries, scientific community and general public. While the private area will be password-protected and dedicated to internal project communication between the project partners only. The private area is going to be a simple platform used for file exchange where the documents can be categorized in folders and each user can upload and download files and create folders if needed when necessary. Finally. The website will be connected to the VISCA accounts on social media such as Facebook, LinkedIn and Twitter.
- **Ensuring the presence of VISCA project online platforms** (e.g. [WineTech network](#), [Wine Technology Platform](#), [European Innovation Partnerships](#), [RuralCat platform](#), [European Climate Adaptation Platform](#), etc.)
- **Participation at dedicated events** such as conferences, exhibitions, workshops and seminars at national, EU and international levels. Participation in events will be monitored and evaluated in a systematic way based on criteria to be set in the CDP. The project intends to participate in at least 3 international exhibitions (with booths) as well as other conferences and seminars. The table below presents few examples of relevant events which will be targeted to disseminate VISCA project, more events will be identified during the implementation of the project:

Event title	Place & Date	About the event	Targeted Audience
<a href="#">GACSA</a>	Rome, Italy, 14-17 June 2016 (Annual)	The Annual Forum of the Global Alliance for Climate-Smart Agriculture, meeting under the theme 'CSA in Action,' will provide the opportunity for participants to share solutions, discuss challenges and build partnerships on CSA. The event will include sessions on: GACSA country case studies, climate finance and investment	Scientific community and policy makers



Event title	Place & Date	About the event	Targeted Audience
<a href="#">EuAWE</a>	Bologne, Italy 7-10 May 2017	Annual conference of the EuAWE European Association of Wine Economists. It promotes the exchange of research in theoretical and applied enometrics. It also produces a magazine.	Wine producers, Scientific community, Economists
<a href="#">Agriculture and Climate Change</a>	Sitges, Spain, 26-28 March 2017	The 2 <sup>nd</sup> Agriculture and Climate Change Conference will focus on the likely impact of climate change on crop production and explore approaches to maintain and increase crop productivity into the future.	Scientific community and policy makers
<a href="#">International Cool Climate Wine Symposium</a>	Brighton, England, 26-28 May 2016	This international Symposium brings together the world's leading producers and experts in cool climate viticulture, winemaking, research and promotion.	Wine producers and distributors, scientific community
<a href="#">Fruit Attraction Exhibition</a>	Madrid, Spain 5-7 October 2016 (Annual)	International Trade Show for the Fruit and Vegetable Industry	Agriculture industry
<a href="#">2017 Unified Wine &amp; Grape Symposium</a>	California, USA 24 January 2017	The Unified Wine & Grape Symposium hosts more than 700 10 ft. x 10 ft. booths and 28 large vineyard and winery machinery areas. The exposition encompasses a wide range of products related to the wine and grape industry and includes international representation in both sessions and exhibits.	Growers, vintners, distributors and allied wine industry members
<a href="#">Innovation + Quality (IQ)</a>	California, USA 2 March 2017	The third annual forum for ultra-premium wineries focused on cutting-edge innovations that advance wine quality.	Growers, vintners, distributors and allied wine industry members
<a href="#">Agritechnica 2017</a>	Hanover, Germany 12-18 November 2017	AGRITECHNICA is the innovations forum for the entire agricultural sector. The leading technologies and new developments shown make the exhibition a unique information platform helping to solve all problems encountered in farming and questions related to agricultural equipment and machinery.	Agriculture and irrigation industry

- **Organisation of two workshops** targeting irrigation communities, vineyards companies, advisory board members, policy makers, legislations bodies, etc. Two workshops will be held at the Spanish and Italian demonstration sites, back-to-back with advisory board meetings, with the objective to explore with potential buyers (problem holders)/users/legislators the value, the risks and barriers and market opportunities. The first workshop, celebrated at M03, will aim the gathering of end-users and stakeholders requirements, plus feedback on extrapolable opportunities, while the final workshop will make public and cover the results and outcomes of the complete project, open to anybody but primarily directed at main stakeholders and end-users.
- Creating **promotional materials** in a visually-appealing way throughout the whole duration of the project, distributed within the Consortium, and spread by the project participants during conferences and other events. These materials include:
  - Printed materials: brochures (at least 3000 copies in English), posters (at least 4 posters: 1 in English, 1 in Italian, 1 in Spanish and 1 in Portuguese), roll-ups (1 photo-based, 1 text-based) and a factsheet.
  - Digital materials: presentations, newsletters (2), case studies and a short video.

- At least 6 press releases
- Encouraging the project partners to publish project results in relevant journals and magazines. At least **3 articles** will be published. All publications derived from the VISCA project will contain an acknowledgement of the European Commission for project funding and confirm with the visibility rules of the EC.

#### **Relevant magazines where VISCA could be disseminated:**

- [Tecnoambiente Magazine](#) (Tecnología Internacional del Agua, S.A. Editorial – Spain) ;
- [FuturEnviro Magazine](#) (Alarcón, Barreto y Asociados Editorial Group –Spain);
- [Actas de Horticultura](#) (SECH, Spain)
- [The grapevine magazine](#)
- [The wine business monthly](#)
- [Wine & Viticulture Journal](#)
- [The WineLand magazine](#)
- [The American vineyard magazine](#)
- [Editorial Agrícola Española](#) (Spanish Agricultural Editorial);
- [La France Agricole](#)
- [Agriculture today](#)
- [Horizon magazine](#)
- [EU Research](#)
- Newsletter and technical reports from the [International Organisation of Vine and Wine](#)

SEMIDE will set a monitoring action every 6 months to evaluate and measure the dissemination and communication activities through several quantitative and qualitative indicators. The aim of this monitoring is to ensure that the process of dissemination is performing well and the objectives of the CDP are met. Such indicators include:

- ✓ Type and number of reached targeted audience,
- ✓ Number of visitors to the website
- ✓ Frequency of participation in relevant events
- ✓ Number of dissemination materials
- ✓ Number of articles and press studies, etc.

Regarding the engagement of stakeholders including the general public, exchanges through the different events and Medias will be essential in order to collect feedbacks. This monitoring is also a part of the CDP.

## **3. Implementation**

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### **3.1. Work plan – Work packages, deliverables**

#### **3.1.1. Brief presentation of the Overall Structure of the work plan**

The project will last 36 months, allowing at least 2 years for testing and validation in 3 different Mediterranean locations (Spain, Italy and Portugal) (**WP4**). Innovation is going to be carried out in **WP2** and **WP3**, where simulation and running of models (see **Table 1**) and the design and implementation of the CS-DSS is going to be carried out. The information gathered during **WP4** and **WP1** (through the deployment of the tool, plus advisory board/project meetings) will be used in **WP5** for market-uptake activities, dissemination and preparation of a document about feasibility of the tool in other sectors (aiming at regional/national relevant organizations and policy makers). In addition, historical evaluation of temperatures linked to harvesting dates and decadal projections on the three sites will be written in **WP2**, which is devoted to give useful information to end-users and policy makers. VISCA will be structured in 5 work packages:

**WP2** is devoted to the simulation of climate models, phenological and irrigation models. The used models will be used for real-time implementation for the whole growing season, from April to October. On other time scale,



Meteosim will deliver the climate information at multi-decadal time scale. Such information will be needed by the end-users for strategic planning and adaptation decisions, for example giving hints on the potential geographical shift of viticultural regions. In addition, historical climate data to show the temperature variations (if any) of harvesting dates in the past will also be performed. Short-term forecasting will be performed on extreme events, useful to design preventive measures. **WP3** aims at designing and implementing both the DSS-CS centralized component (CC) and the mobile application (MA). The solution will be co-designed and co-implemented with end-users. A data visualization library supporting multiple screen sizes and resolutions will be implemented to allow interactive and dynamic visualization of geo-located data and maps. The Mobile application will allow subscribed end-users to visualize all data coming from the CC and to provide geo-located feedback from the crop field. Such in-field measurements will be stored at the CC and used to downscale the models. Finally, a System Test and Validation will be performed on the use cases supported by the platform. During **WP4** the demonstration of the tool over the demo sites will be carried out. A pilot plot will be used in the 3 demo sites within the commercial fields of the end-user wineries involved. Every pilot orchard will be grown and trained according to the commercial practices of each concerned winery. During the entire project lifetime, the main barriers to apply the tool at the demo sites will be gathered and compiled into a deliverable (D4.6). Finally, success of the tool will be evaluated with different quality parameters. Regarding Dissemination, Communication and Exploitation, **WP5** will ensure that the project objectives, activities and outcomes reach the relevant target groups in and beyond the demo site countries, and prepare for the market uptake of VISCA's tool. This WP will also support networking with relevant initiatives related to vineyard<sup>77</sup>, olive, and cereals. Finally, a business plan for a rapid market up-take of VISCA at international level will be designed, to assure the marketability of the tool.

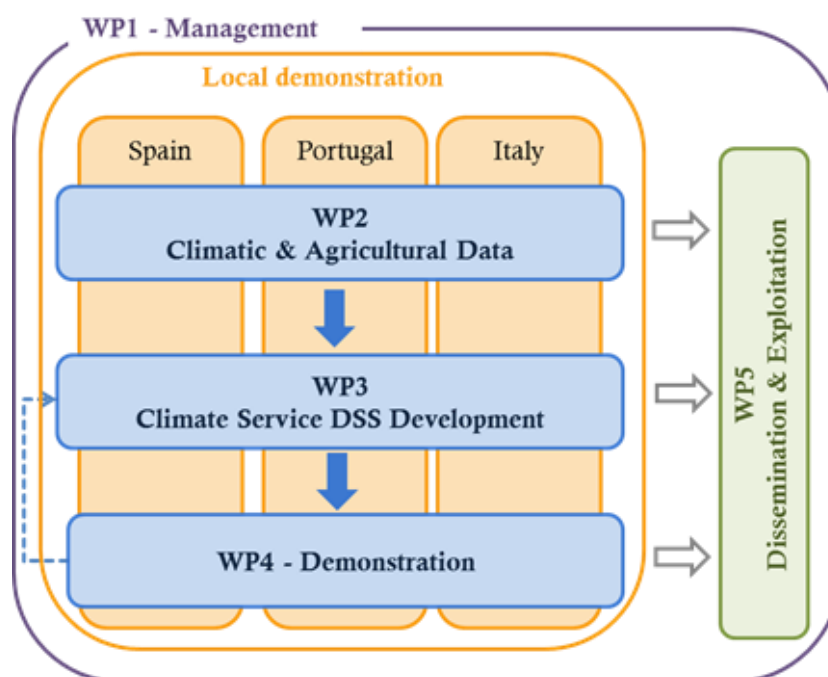


Figure 13. Overall Work Packages Structure of VISCA

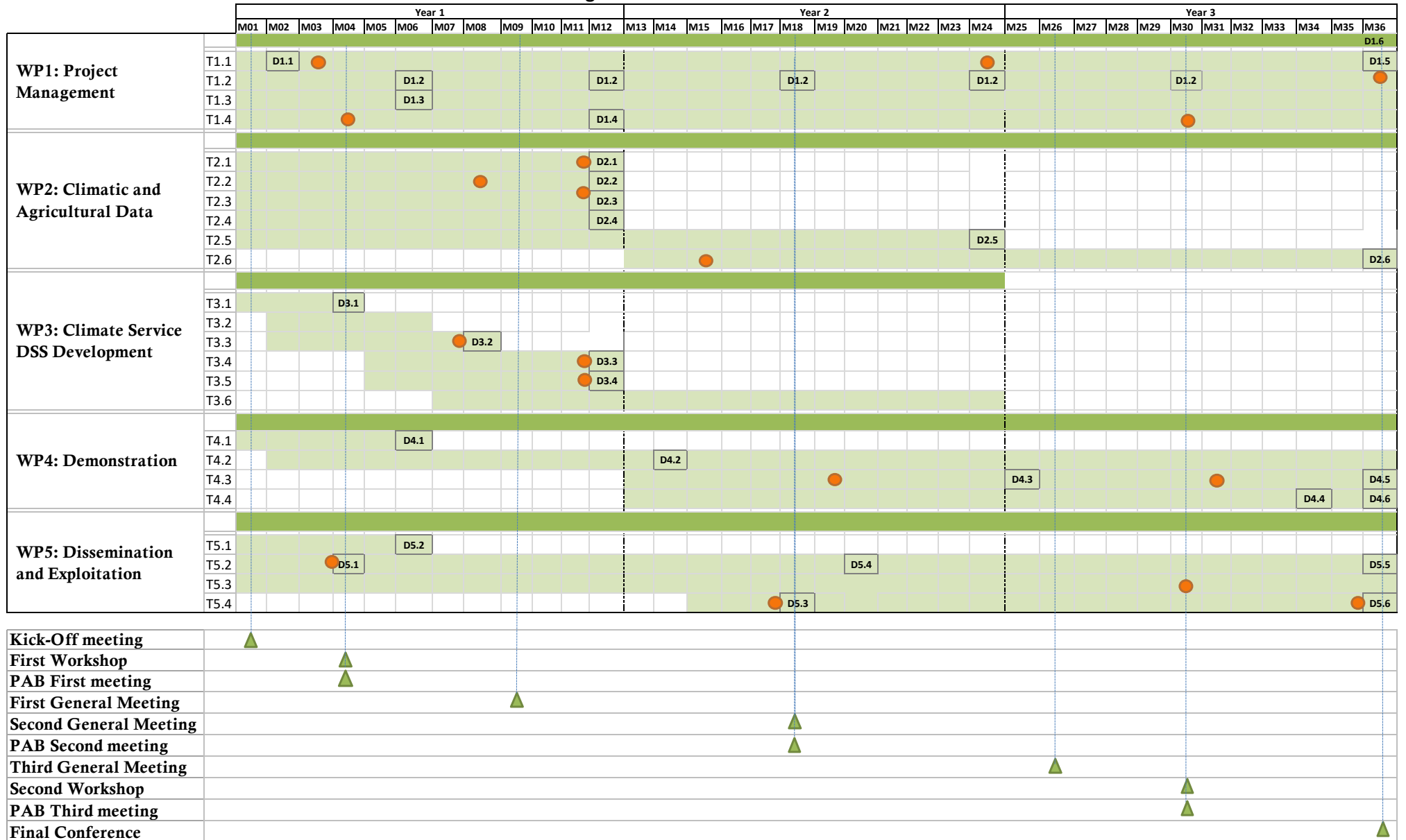
### 3.1.2. Timing of the different work packages



The figure below shows the Gantt chart of VISCA, where the main events in every task are stressed, including deliverables and milestones.

Main Meetings are already planned, which include: Kick-off, general, PAB meetings, workshops, and the final conference.

<sup>77</sup> E.g. the H2020 collaborative project WINETWORK, VitiSmart project or WineTech network

Figure 14. Gantt chart of VISCA



 Milestone  
 Meetings/Events  
 \*PAB = Project Advisory Board

### 3.1.3. Detailed Work Description

Tables 3.1.a: Work Package description

Work Package Number	1		Lead Beneficiary		MET	
Work Package Title	Project Management					
Participant Number	1	2	3	4	5	6
Short Name of Participant	MET	BSC	COD	IRTA	ISMB	UNAP
Peron/months per participant	30	1	6	8	5	1
Participant Number	7	8	9	10	11	
Short Name of Participant	MAST	SYM	UPORTO	SEM	ALPHA	
Person/months per participant	2	1	0	9	6	
Start Month	M01		End Month			M36

#### Objectives

The scope of this WP is the overall management of the activities to be performed in the project, including:

- Administration and Financial affairs
- Quality assurance
- Risk management
- Data Management
- Advisory board and innovation management.

#### Description of Work

##### Task 1.1: Project management

**Duration:** M01-M36

**Participants:** MET (leader), BSC, COD, IRTA, ISMB, UNAP, MAST, SYM, UPORTO, SEM, ALPHA

This task will deal with the coordination of the project by managing and promoting the interactions among different WPs, ensuring an efficient internal communication, monitoring of the progress, the quality of major project outputs. An intranet will be setup by MET during the 1<sup>st</sup> months of the project to share documents and allow collaborative working. The task also includes the management of legal, contractual, financial and administrative aspects of the project, such as:

- Reports to EC;
- Management of the financial contribution from EC, including preparation and distribution of progress accounts;
- Organisation of progress/team meetings;
- Tracking of costs and compliance with Grant Agreement;
- Consolidation of the consortium agreement, (using latest DESCA template);
- Ensure internal dissemination of project information among the consortium members.

Scientific and technological management of the project will be achieved through a steering committee comprising IRTA, as chairperson, and the Work Package leaders (who have been allocated 1 man months each for this activity). The steering committee will meet at regular intervals to discuss project progress and ensure the objectives of the project are being achieved in accordance with the grant agreement. WP leaders will also be responsible for first checking the financial and technical reports associated with their WP's

##### Task 1.2: Quality assurance and Risk management

**Duration:** M01-M36

**Participants:** IRTA (leader), MET

This task will take up a quality management approach by controlling reported resource usage, review of project documents and results, maintenance of the project work plan and monitoring the progress in all WPs (in terms of project plans and quality measures). Moreover, an initial risk management plan will also be implemented to identify potential mishaps during the entire project execution and prepare action plan that will deal with them should they emerge. Provisions will be taken to minimize potential problems. The

management will be punctual and continuous, with the attitude to prevent possible failures or difficulties rather than waiting to solve them when they had already been evident.

A preliminary risk management plan will be delivered at M06, and updated regularly with newly detected hazards.

### **Task 1.3: Data management**

**Duration: M01-M36**

**Participants: SEM (leader),** MET, ISMB, IRTA, BSC

All data sets and services used or produced by the project will be described using metadata compliant with the INSPIRE Directive requirements. Brief guidelines will be produced for the partners as well as an online editor tool (e.g. JRC or dedicated project metadata catalogue or editor) for validation of INSPIRE compliance. In this way data quality will also be documented, data and services (description) produced by VISCA can be exposed within the European Spatial data infrastructure set up by INSPIRE Directive. General guideline on the data management and handling will be defined in the Data Management Plan. It will take into account the requirements for data integration and processing of VISCA climate service and mobile application (to be defined under task 3.3). It will include information on how research data will be handled during and after the end of the project; what data will be collected, processed and/or generated; which methodology and standards will be applied; whether data will be shared/made open access and how data will be organized and accessible during and after the project.

### **Task 1.4: Innovation Management. Engagement with Project Advisory Board (PAB) and end users**

**Duration: M01-M36**

**Participants: ALPHA (leader),** MET, COD, MAST, SYM, SEM

This task will deal with the management of the innovation process and the Project Advisory Board (PAB) (see **Table 10**) established within the VISCA project. This task has two main goals. First of all, it aims at keeping the board members updated about project's evolution in order to get constant feedbacks, ideas and point of views useful to drive the evolution of the project. Second, it will respond to internal and external opportunities to successfully implement the innovative solutions proposed by VISCA.

## **Deliverables**

### **Deliverable 1.1: Kick-off meeting report (M02)**

Reporting the results of the kick-off meeting

### **Deliverable 1.2: Risk management plan (M06, M12, M18, M24, M30)**

It will identify potential mishaps during the execution of the project and related recovery actions. It will be issued at an early stage of the project, and then updated continuously.

### **Deliverable 1.3: Data Management Plan (M06)**

It will describe the data management life cycle for the data to be collected, processed and/or generated by the project. It will be used as a standard data guideline for the project consortium to ensure interoperability and sharing for public dataset generated by the project.

### **Deliverable 1.4: Innovation Management Plan (M12)**

The innovation manager will produce a report that provides a high-level guidance on establishing and maintaining an innovation management system (IMS) during the whole project. This IMS will be intended as a set of interrelated or interacting elements of an organization to establish innovation policies and objectives, and processes to achieve those objectives, in line with the CEN/TS 16555-1.

### **Deliverable 1.5: Final report (M36)**

It will contain the achievements, obstacles and description of activities carried out during the project.

## **Milestones**

### **Milestone 1.1: Deployment of VISCA's web-based tool (M03)**

VISCA's web-based tool will be deployed by MET during the third month of the project, in order to ensure

a fluid communication and collaborative work among the partners of the consortium.

#### **Milestone 1.2: First Advisory Board Meeting (M04)**

In parallel with the first workshop of the project, we plan to have an exclusive Advisory Board meeting aimed at informing them about the state of the projects, barriers, and opportunities of replicability.

#### **Milestone 1.3: Mid-term review (M24)**

To check the progress of the development activities, main outcomes, barriers and delays.

#### **Milestone 1.4: Second Advisory Board Meeting (M30)**

In parallel with the second workshop of the project, representative data on the application of the tool will already be available, therefore the main objective will be the collection of information and ideas from the different sectors, to start laying out the bases for D5.4.

#### **Milestone 1.5: Final Conference (M36)**

A final conference will be celebrated the last month of the project, to present results and outcomes to the consortium and the PAB.

Work Package Number	2		Lead Beneficiary		BSC	
Work Package Title	Climatic & Agricultural Data					
Participant Number	1	2	3	4	5	6
Short Name of Participant	MET	BSC	COD	IRTA	ISMB	UNAP
Peron/months per participant	25	32	2	8	2	6
Participant Number	7	8	9	10	11	
Short Name of Participant	MAST	SYM	UPORTO	SEM	ALPHA	
Person/months per participant	0	3	12	0	0	
Start Month	M01		End Month			M36

#### **Objectives**

- Improve the understanding of the seasonal forecast indicators known to affect wine management
- Assess long term influences of climate in the current wine regions and identify potential areas for future wine plantation.
- Assessment on preventive measures throughout the production of short-term weather forecast.
- Assess the interaction between phenological and water requirements existing models with climatic models.
- Coordinate a novel multi model approach for vineyard management.

#### **Description of Work:**

This work package will combine climate models with phenological and irrigation models to produce useful information for crop management (by means of climate predictions) and planning (climate projections). According to winegrower priorities,<sup>78</sup> medium-short term management measures such as changes in harvesting are crucial. However, to estimate future climate variability over the coming weeks or seasons, current practices use an approach based on retrospective climatology or persistence of the most recent climate, with an assumption that the past is a valid representation of the future. Recent advances in climate predictions can provide a more informative view by modelling future climate variables over months or seasons.

For longer time scales, climate projections will be analysed to produce climate information at multi-decadal time scale (2020, 2030, 2040). Long-term information may be crucial not only for winegrowers (e.g. changing varieties of grapes) but also may help stakeholders to define policy changes. On a shorter

time scale, extreme weather forecasts will allow for the design of adequate preventive measures against extreme weather events.

Both, climate predictions and climate projections results, will be integrated within phenological and irrigation requirements models which will forecast both the vineyard water requirements and relevant vine events (bud-break, veraison and harvest dates) and yields (quantity and basic quality parameters). Vineyard water requirements will be used to adjust irrigation strategies and canopy management practices, based on real vineyard water availability.

### **Task 2.1 Seasonal forecast predictions quality assessment**

**Duration: M01-M12**

**Participants: BSC (leader), MET**

BSC will integrate the recent advances in climate prediction to provide atmospheric indicators known to affect wine management (for instance, predictions of precipitation extremes relevant for the industry such as the percentiles 10 and 90 over the growing season), large-scale indices that allow to build stories explaining the reasons behind what could happen in the next few months and an assessment of the influence of medium/short-term climate change, all from seasonal predictions. With the objective of providing real-time robust forecast information, the North American Multi-Model Ensemble<sup>79</sup> and the Copernicus Climate Change Service will be both used. Climate forecast systems are affected by biases, in this sense, a range of bias-correction methods will be applied to obtain similar statistical properties as found in the observed variables. Statistical downscaling, understood as a form of bias adjustment, will be used whenever the users require local information. Model results will be evaluated against observational data sets, wherever available, and a number of reanalyses and observational gridded datasets. Uncertainty estimates and reliability will be estimated using ensemble prediction standard methodologies to contribute to the interpretation of the robustness of the climate information, a key element in any decision-making process.

The quality assessment described in Task WR2.1 will be performed for a previous year (diagnostic case of study), selected according to two main requirements: user interest and availability of observational data to conduct a comprehensive assessment. The selected period of study will define the case study also for Tasks 2.4 and 2.5.

### **Task 2.2 Operational weather forecast extreme events system.**

**Duration: M01-M12**

**Participants: MET (leader), BSC**

Meteosim will develop and supply the weather forecast services for extreme events, which consists in delivering the best prediction of high impact weather variables (precipitation, temperature, relative humidity, etc.), at forecast time scales from hours up to five days (120 h). This information could be useful to wine producers to minimize risks related to coming extreme events (for instance, if heat waves is forecasted in three days, wine producers could act in advance irrigating the field two days before the event). With the objective of providing the most accurate weather forecast for each region considered in the project, Weather Research and Forecasting model (WRF-ARW<sup>80</sup>) - a next-generation mesoscale numerical weather prediction system - will be used. The availability of weather observational data on the simulated areas will be used, as well as assimilation methods, in order to combine them into the model to produce the best weather forecast. Model results will be evaluated against available observational data. The model will be initialized with data from a larger scale, the Global Forecast System (GFS) and the iterated forward in time. Meteosim will calibrate the meteorological model WRF-ARW for operational forecasting of the extreme events in order to achieve the optimum model configuration for each demo-site. An accurate meteorological forecasting will allow reducing the impact of the extreme events over the different regions. To do this, some experiments will be define using the most sensitive model configurations.

<sup>79</sup> <http://www.cpc.ncep.noaa.gov/products/NMME>

<sup>80</sup> <http://www.wrf-model.org>

Meteosim plans to run twice a day the WRF-ARW model on a 1 Km outer grid resolution (covering as much of the regions as necessary to capture local extreme weather events). Forecasted high impact weather variables will be delivered in 1 h time resolution in order to have on-time, accurate information.

### **Task 2.3 Phenological Models**

**Duration: M01-M12**

**Participants: IRTA (leader), UNAP, UPORTO**

There will be three different phenological models that will predict different events according to the concerned organs of simulation: i) dormant bud model, ii) berry model, iii) leaf model and (iv) CropSyst. Model calibrations will be performed for *Chardonnay* and *Tempranillo* in Spain, for *Touriga Nacional* in Portugal and for *Aglianico* in Italy.

The dormant bud model will predict the date of bud break that is considered the time when plants start their vegetation season. For this purpose, the BRIN model<sup>81</sup> will be used. The parameters of this model will be calibrated during the first year of the project using a historic data repository already available in the different academic institutions from past research projects. The BRIN model requires having data on maximum and minimum daily temperature from 1<sup>st</sup> August till 1<sup>st</sup> June, which will be available from Seasonal Predictions (monthly actualized).

The berry model will use a general flowering and veraison model<sup>82</sup> to predict the following events: blooming, berry set, veraison and berry maturity. The parameters of this model will be calibrated during the first year of the project using a historic data repository already available in the different academic institutions from past research projects. For its simulation it will require having data on maximum and minimum daily temperature from Bud-break to 1<sup>st</sup> December. In the case of simulation for crop forcing the data requirement will be from the day the crop is planned to be forced until 1<sup>st</sup> December. These data will be available from Seasonal Predictions (monthly actualized).

The end of the vegetative season will be predicted by using a model developed at the University of Naples<sup>83</sup>, while harvest dates will be forecasted using a new model developed by IRTA (Crop-Syst based).

### **Task 2.4 Irrigation requirement models**

**Duration: M01-M12**

**Participants: IRTA (leader), UNAP, UPORTO**

Annual irrigation requirements will be predicted using VSIM developed by Lars Pierce from Williams and Ayars principles<sup>84</sup>. The model requires availability of several physical description parameters of the orchard and soil on which the vines are growing. In addition, it requires having available daily data on Penman-Monteith reference evapotranspiration (ET<sub>o</sub>). These will come from the seasonal predictions with monthly actualizations. For the calculation of ET<sub>o</sub> and the estimation of orchard water balance, daily predictions are needed on: i) rainfall, ii) maximum and minimum air temperature, iii) maximum and minimum air relative humidity, iv) Global solar radiation, v) wind speed measured at a reference of 10 m height. The model will require some calibration since it has been developed for Thomson-Seedless cv and we are going to use it for predicting the irrigation requirements for *Chardonnay* and *Tempranillo*.

### **Task 2.5 Decadal Climatic Data<sup>85</sup>**

**Duration: M01-M24**

<sup>81</sup> García de Cortázar-Atauri *et al.* (2009). Performance of several models for predicting budburst date of grapevine (*Vitis vinifera* L.). *Int J Biometeorol* 53(4), 317-26

<sup>82</sup> Parker A.K *et al.* (2011). General phenological model to characterise the timing of flowering and veraison of *Vitis vinifera* L. *Australian Journal of Grape and Wine Research* 17, 206–216.

<sup>83</sup> Mazzoleni S.*et al.* (2015). A new process-based approach to model plant phenology based on carbon allocation. *13th Swiss Geoscience Meeting*, 20-21 November 2015, Basel.

<sup>84</sup> Williams LE and Ayars JE (2005). Grapevine water use and the crop coefficient are linear functions of the shaded area measured beneath the canopy. *Agr Forest Meteorol* 132: 201-211

<sup>85</sup> Production of climate information at multi-decadal time scale to be used by end-users for strategic planning and adaptation decisions at long term

**Participants: MET (leader), BSC**

Meteosim will be involved in the second part of the tool that consists in delivering the best climate information at multi-decadal time scale. Such information will be needed by the end-users for strategic planning and adaptation decisions, for example giving hints on the potential geographical shift of viticultural regions.

The usual spatial resolution of global climate models at multi-decadal timescale is around 100 km. However, for the wine grape production, application information is required at significantly finer spatial scale. This justifies the choice of using the 12.5 Km-resolution downscaled Euro-Cordex dataset over Europe instead. Such dataset consists of an ensemble of climate simulations based on multiple dynamical and empirical-statistical downscaling models forced by multiple global climate models from the Coupled Model Intercomparison Project Phase 5 (CMIP5). The set of simulations with a horizontal resolution of 12.5 Km have emission scenarios RCP4.5 (9-member multi-model ensemble) and RCP8.5 (10-member multi-model ensemble). In order to produce the decadal climatic prediction for the 20-30 years' time-scale considered, a set of historical climate models data will be evaluated over the areas of interest. The final result will be conveyed within the consortium and the Advisory Board, to produce D2.5.

**Task 2.6 Real-time application of seasonal forecast predictions.****Duration: M12-M36****Participants: BSC (leader), MET, IRTA, UNAP, UPORTO, ISMB**

The model chain defined in Tasks 2.1, 2.4 and 2.5 will be implemented for real-time execution for the whole growing season, from April to October. During the growing season, every month the seasonal prediction information will be updated using the latest simulations started over the precedent 30 days. Model results will be implemented in the Climate Services DSS-CS in WP3 to conduct demonstration exercises in WP4.

**Deliverables****Deliverable 2.1. Seasonal forecast predictions quality assessment report (M12)**

Reporting the results derived from the climate predictions with a further discussion of the essential climate variables with high potential impact in agriculture.

**Deliverable 2.2. Report on weather forecast extreme events (M12)**

Reporting the WRF\_ARW model performance over the 3 demo-sites. The report will provide preliminary weather prediction maps for the considered extreme weather fields.

**Deliverable 2.3. Report on the performance of phenological model (M12)**

Reporting the performance of all the phenological models tested in the project highlighting the flexibility of the models to forecast predictions. The report will include several predictions providing a better understanding of the impact of climate change on agriculture.

**Deliverable 2.4. Report on the performance of irrigation requirements model (M12)**

Reporting how water requirements could change depending of climatic conditions. Reporting several trends of water needs in future years and under different climatic scenarios will be relevant for agriculture

**Deliverable 2.5. Decadal projection performance report (M24)**

Reporting the results derived from analysis of the decadal projections, which includes a historical evaluation of temperature and precipitation pattern changes of the last 20 years.

**Deliverable 2.6. Report on coordinated seasonal forecast – phenological – irrigation requirement models for real-time applications (M36)**

This report will include general information of D2.1, D.2.2, D2.3, D2.4 and D2.5, describing how the project connected all the activities. The report will provide preliminary predictions of all the models components involved in the project at the same time.

**Milestones**



**Milestone 2.1. Availability of weather forecast information for the 3 demo-sites (M08)**

**Milestone 2.2. Availability of seasonal forecast simulations for the diagnostic case of study (M12).**

**Milestone 2.3. Availability of calibrated Phenological and Irrigation Requirement models for the different demo zones and cultivars (M12)**

**Milestone 2.4. Real-time seasonal-phenological forecast simulations (M15).**

Work Package Number	3		Lead Beneficiary		ISMB	
Work Package Title	Climate Service and Mobile Application					
Participant Number	1	2	3	4	5	6
Short Name of Participant	MET	BSC	COD	IRTA	ISMB	UNAP
Peron/months per participant	10	2.5	6	4	36	9
Participant Number	7	8	9	10	11	
Short Name of Participant	MAST	SYM	UPORTO	SEM	ALPHA	
Peron/months per participant	9	2	3	1	0	
Start Month	M01		End Month			M24

### **Objectives**

The objective of this work package is the definition of the end-user requirements, and the subsequent design, implementation and test of both the mobile application and the climate service module. The solution will be co-designed with the end-users that are included in the consortium and co-implemented with research centres and companies that have been working closely with such end-users.

### **Description of Work**

ISMB will lead the WP3, which will follow a user-driven approach in order to design and implement both the climate service module and the mobile application. The former will integrate the data sources and the outcomes of the climate models into a Geospatial database and it will provide them to the Decision Support System (DSS), which will implement a visualization dashboard containing selectable and actionable geospatial data layers. The DSS will be able to process the data in order to suggest crop management actions and show georeferenced data in a dynamic and interactive map. The aim of the mobile application is both to provide data visualization through mobile devices and to collect in-filed feedback about climatic data and crop conditions, which will be used for fine-tune model outcomes and DSS predictions. **Agile approaches** will be followed during the development phase, which means using multiple implementation cycles (2-3) to incrementally realize the system functionalities. Each cycle, which will be managed according to SCRUM principles<sup>86</sup>, consist in a definition phase (PLAN), a realization phase (DO), and a testing phase (TEST). Agile approaches are the latest and greatest method to develop advanced ICT solutions because they improve the design and the implementation reliability through early bug discovery and incremental system integration.

#### **Task 3.1 End-user requirement definition**

**Duration: M01-M04**

**Participants: COD (leader), MAST, SYM, IRTA, UNAP, UPORTO**

This task is required to co-define the solution with the end-users that are partners in the consortium, and it is aimed at the definition of their requirements in terms of crop planning. A workshop will be organized within task 5.2, which will help achieving this objective.

#### **Task 3.2 Technical requirement and architectural design**

**Duration: M01-M06**

<sup>86</sup>[https://en.wikipedia.org/wiki/Scrum\\_\(software\\_development\)](https://en.wikipedia.org/wiki/Scrum_(software_development))

**Participants: MET (leader), ISMB, BSC, IRTA, UNAP, UPORTO**

Starting from the end-user requirement, the technical requirement and the software architecture will be defined in this task. They will serve as reference for the system implementation of both the centralized component of the Climate Service and of the Mobile Application.

### **Task 3.3 Data integration and processing**

**Duration: M01-M08**

**Participants: ISMB (leader), BSC, MET, ISMB, IRTA, UNAP, UPORTO**

This task will specify the data formats and protocols for the information exchanges that will happen between the main VISCA modules, namely within the Climate Service and between the Mobile Application and the Climate Service. It also includes the description of the data processing chains and the implementation of the algorithms of the DSS. The geospatial database implementation is included in this task.

### **Task 3.4 DSS development and data visualization DSS**

**Duration: M05-M12**

**Participants: ISMB (leader), COD, MAST, SYM**

A data visualization dashboard will be implemented in order to be compatible with multiple screen sizes and resolutions, allowing interactive visualization of geolocated data and maps coming both from the internal data sources and from the mobile application. Previous study on usability and user experience will be taken into account so as to provide an effective graphical interface and easy interaction. The algorithms for the DSS will be implemented and its outcome will be integrated in the graphical dashboard.

### **Task 3.5 Mobile application development**

**Duration: M05-M12**

**Participants: ISMB (leader), COD, MAST, SYM**

The goal of this task is to design, develop, test and validate the VISCA cross-platform mobile application for end-users. The mobile application will allow subscribed end-users to visualize all data coming from the DSS and to provide geolocated feedback from the crop field. Such in-field measurements will be stored at the DSS and used to downscale the models.

### **Task 3.6 System integration, test, and fine tuning**

**Duration: M07-M24**

**Participants: MET (leader), ISMB, BSC, IRTA, UNAP, UPORTO**

This task will perform the full integration between the different VISCA components, and it will realize the tests to validate the use cases designed. The VISCA system will be subject to an iterative test plan that will follow the agile development cycles. The system will be fine-tuned according to the feedbacks that will be received during the real experimentation.

## **Deliverables**

### **Deliverable 3.1: End-User requirements (M04)**

It reports the outcomes of the end-user analysis, providing their identified needs for the overall project.

### **Deliverable 3.2: Technical specifications (M08)**

It contains the technical requirement and the definition of the system architecture for both the climate service and the mobile application. It also includes the specification of the data formats, of the interfaces, and of the processing algorithms.

### **Deliverable 3.3: Decision Support System (M12)**

It is the implementation of the Decision Support System together with a release note that will list the tests that have been realized.

### **Deliverable 3.4: Mobile application (M12)**

It is the implementation of the mobile application, published in the mobile app stores, together with a release note that will list the tests performed.

## Milestones

### Milestone 3.1: DSS design review (M08)

Through which the deliverable D3.1 and D3.2 will be presented and reviewed in a dedicated meeting, which will take place in parallel with the general meeting in M09.

### Milestone 3.2: First release of the DSS (M12)

### Milestone 3.3: First release of the mobile application (M12)

Work Package Number	4		Lead Beneficiary		IRTA	
Work Package Title	Demonstration					
Participant Number	1	2	3	4	5	6
Short Name of Participant	MET	BSC	COD	IRTA	ISMB	UNAP
Peron/months per participant	11	12	24	48	6	53
Participant Number	7	8	9	10	11	
Short Name of Participant	MAST	SYM	UPORTO	SEM	ALPHA	
Peron/months per participant	36	18	11	0	0	
Start Month	M01		End Month			M36

## Objectives

The main objective of this WP is to validate at the field level the adequate performance of a DSS to manage different vineyards, weather conditions and water availability scenarios in order to facilitate vineyard grower's management.

### Specific objectives:

- Adjustment and validation of the different physiological and phenological models to be implemented into the DSS.
- To evaluate the robustness of the DSS to predict scenarios.
- The re-evaluation of the existing models, if any significant deviation is observed.
- Using the pilot plots as a platform for extension activities.

## Description of Work

The work will be performed on three pilot plots located in three different places (Spain, Portugal and Italy). These plots will be placed on commercial vineyards with end-users wineries involved in the project. Every pilot plot will have a size of 1 ha (minimum) and vines will be grown and trained according to the commercial practices of each concerned winery:

### Spain

The activities will be carried out by IRTA at the Codorniu (Raïmat) demo site, with the main objective to evaluate the DSS in order to implement Crop-Forcing Techniques to avoid negative Climate Change effects on wine-grapes quality. Raïmat is a winery belonging to the Codorniu Group located at the Lleida area. The Spanish pilot plot will have an area of 3 ha.

### Italy

The activities that will be carried out by UniNa at the Mastroberardino demo site will aim to develop a tool to help the viticulturists to decide the right intensity of post-veraison leaf removal (by defoliation or trimming) to control sugar accumulation in the berry and to achieve the desired wine alcohol concentration. The demo site that will be used in Italy is within a vineyard of 65 hectares owned by the Mastroberardino winery and located in Mirabella Eclano (Avellino).

### Portugal

During the first year of the project the site will be characterized (climatically, the soils and the vineyard). The Crop Forcing Technique will be then applied for two years (second and third project years). All this information will be used to validate the phenological models already available, partially developed by IRTA

(Spain), and the main activities will be coordinated with IRTA. UOPORTO will record all this information, together with weather information, but also will follow some physiological parameters (Stem water potential, canopy development, and berry growth) at some specific moments of the season. The area devoted to the pilot-plot will be 1 ha.

#### **Task 4.1. Pilot Plots Implementation**

**Duration: M01-M06**

**Participants: IRTA (leader), COD, UNAP, MAST, UPORTO, SYM**

The first task will be to find the appropriate vineyard to implement de pilot plot with the appropriate characteristics for this activity. Vineyard size, orientation, age, uniformity, cultivar, soil depth will be taken into account for the selection. Once the plot is selected, the experimental setup (irrigation system adaptation if needed, treatments distribution, specific field equipment, etc.) and the necessary vineyard modifications will be implemented.

#### **Task 4.2. Calibration and validation of the models**

**Duration: M02-M36**

**Participants: UNAP (leader), IRTA, UPORTO, BSC, MET**

During the first year of the project, these orchards will be used for the calibration/validation of the phenological and irrigation models. For the three pilot plots, climate forecast simulations will be bias-corrected to obtain similar statistical properties, as found in the observed variables in coordination with Tasks 2.1.

In the case of “Canopy Management” (Italy), most of the effort will be done to (i) calibrate the phenological model to the Aglianico clone grown at the Mirabella; (ii) calibrate the water balance model to the Mirabella demo site conditions; (iii) calibrate the empirical relationships between soluble solids content in the berries at harvest and the total vine leaf area to fruit yield ratio at different dryness conditions. For the case of “Crop-Forcing” (Spain and Portugal) the calibrations will be done on (i) phenological models to predict bud-break, (ii) yield and quality forecasting model to predict harvest time, yield and quality, (iii) water balance model for different cultivars at the two regions.

Meteosim will validate the meteorological model to evaluate the operational model performance. Modelled and observed data from available local meteorological stations will be compared

#### **Task 4.3. DSS Application**

**Duration: M13-M36**

**Participants: ISMB (leader), IRTA, COD, UNAP, MAST, UPORTO, SYM**

During the second year, the applications will be fully tested and deviations analyzed for possible further corrections of models (included seasonal predictions). Finally, the third year will be when all applications will run freely without strict supervision and their finally accuracy evaluated as a parameter for success. In the case of “Canopy Management” we will test the decision support system about the intensity of leaf removal by post-veraison summer pruning based on (i) estimations of total vine leaf area and fruit yield per vine based on non-destructive field measurements carried out at veraison; (ii) predictions of soil water balance between veraison and harvest based on climate predictions.

The tool will give information about what fraction of leaf area will be required to be removed by post-veraison summer pruning to reach the target soluble solids content in the berries at harvest, which corresponds to the desired probable alcohol concentration in the wine.

For the case of “Crop-Forcing” the DSS will be used to determine the adequate date to practice the second summer pruning based on climatic forecasting, expected harvest yield, yield quantity and quality, and water availability.

#### **Task 4.4. Piloting and Evaluation of the tool**

**Duration: M13-M36**

**Participants: IRTA (leader), all partners**

Besides a comprehensive evaluation of the different components of the model chain (e.g. seasonal forecast simulations), the main barriers to apply the tool at the demo sites will be gathered and compiled during the entire project lifetime, into the deliverable D4.5.

Success of the tool will be measured under the vineyard quality parameters:

- Forecasting of harvest amount vs. real harvest
- Forecasted harvest date in bud-burst plots vs. real harvest date
- Parameters of Wine Quality (sugar content, acidity, pH, Phenolic composition, aromatic composition) Exactitude of the models used
- Barriers found during the implementation
- Effects of the used Water compared to the expected water required (plant water status)

## **Deliverables**

### **Deliverable 4.1. Pilot Plots Implementation Report (M06)**

Once the experimental plots are selected a report with detailed information of the location of the vineyards and their characteristics will be made public for all the consortium. This report will be used as a link with further results of the project.

### **Deliverable 4.2. Report on Calibration process (M14)**

This report will consist in the description of all the field measurements that will be necessary to calibrate the models.

### **Deliverable 4.3. Report on 1<sup>st</sup> year DSS Applications (M25)**

Once the DSS has been tested in the field a report with the main results, derived from the predictions will be available to share with all the members of the consortium.

### **Deliverable 4.4: Assessment of DSS feasibility according to projections on climate change in 3 Mediterranean regions for 2020, 2030 and 2040 (M34)**

A report will be produced on the feasibility and usability of the CS-DSS using the conclusions and final outcomes obtained after the demo-sites application, which will inform policy makers about the potential adaptation strategies to be followed in the Mediterranean areas for the coming decades. This report will likewise include the historical variation patterns of harvesting dates of the last 30 years.

### **Deliverable 4.5. Report on 2<sup>nd</sup> year DSS Applications (M36)**

Similar than the report on the first year.

### **Deliverable 4.6. Main Barriers and Solutions found on the DSS application (M36)**

After the second year the use of the DSS it will be important to perform a detailed report with the difficulties found in the way, how they were solved. Also potentials and limitations for further improvements of the tool will be included in this report.

## **Milestones**

Before the achievement of deliverable 4.3, 4.4., 4.5., the main milestones of this WP will aim at the creation of preliminary reports, prepared during meetings and/or conferences, to share ideas on the progress of models and DSS development to facilitate the solution of potential problems and allow the achievement of the desired deliverables.

### **Milestone 4.1. First preliminary report between research teams (WP2), DSS developers and end-users on the first experiences of the application of the CS-DSS (M19)**

The inputs of this report will be gathered during the second general meeting (M18), after an exclusive meeting between research teams of WP2 and DSS developer. This meeting will be celebrated during the second general meeting in M18.

### **Milestone 4.2. Second preliminary report between research teams (WP2), DSS developers and end-users on a full year application of the CS-DSS (M31)**

The inputs of this report will be gathered during the second workshop (M30), after an exclusive meeting between research teams of WP2 and DSS developer.

Work Package Number	5		Lead Beneficiary		SEM	
Work Package Title	Exploitation, Dissemination and Communication					
Participant Number	1	2	3	4	5	6
Short Name of Participant	MET	BSC	COD	IRTA	ISMB	UNAP
Peron/months per participant	8	2	6	6	4	3
Participant Number	7	8	9	10	11	
Short Name of Participant	MAST	SYM	UPORTO	SEM	ALPHA	
Peron/months per participant	8	4	2	13	30	
Start Month	M01		End Month			M36

This WP will ensure that the project objectives, activities and outcomes reach the relevant target groups (such as irrigation and agricultural communities, farmers, wine makers, educational and training organizations and policy-makers) in and beyond the demo site countries. It will also support networking with relevant initiatives related to vineyard<sup>87</sup>, cereals and deforestation, with a view to evaluate the replicability of VISCA in other agricultural sectors sensitive to climate change. Implementation of the dissemination plan will be carried out to manage the overall dissemination activities of the consortium and support exploitation of results. Furthermore, an analysis of complementary funding mechanisms (e.g. INTERREG, PRIMA initiatives) and replicability to other sectors (e.g. olives, cereals) and other geographical locations (e.g. France, Germany) will be explored for the possibility of the further deployment of VISCA project results.

Moreover, key outcomes from the other WPs will be obtained and used as basis for the preparation of dissemination material (factsheets, video), a business case, the exploitation strategy and the market uptake of VISCA's tool. In fact, the WP will support commercial exploitation of the project results in an international scale and at the preparation of a realistic business plan.

#### **Specific objectives**

- Increase global visibility of VISCA project and its outcomes in Europe and beyond.
- Raise the awareness of the target groups and potential users about VISCA; understand what it can deliver and how it relates to their needs.
- Place VISCA tool among the top of the EU climate-related innovations.
- Exchange the information and results on national and regional activities and agendas to contribute in developing related initiatives and projects.
- Enhance European and global market uptake of VISCA tool.

#### **Description of Work**

##### **Task 5.1 –Communication and Dissemination plan**

**Duration:** M01-M06

**Participants:** SEMIDE (leader), all partners

The Communication and Dissemination Plan (CDP) will be the main guideline for the performance of the dissemination activities carried out by VISCA consortium. It will define the following key points: dissemination objectives, key messages, stakeholder analysis & prioritization to identify the target audiences, channels and tools of dissemination including the official website & social media, participation of events, workshops, magazines and platforms, planning promotional materials, timing of activities, financial and human resources per partner, methodology, achievement indicators and the graphical identity (compliant with the EC visibility rules). It will support the business and exploitation plan (defined in task 5.4). Finally, the CDP will give some recommendations on communication activities to be carried out after the end of the project.

##### **Task 5.2 –Communication and Dissemination Activities (M1-M36)**

**Duration:** M01-M36

**Participants:** SEMIDE, all partners

<sup>87</sup> E.g. the H2020 collaborative project WINETWORK, VitiSmart project or WineTech network

#### *Subtask 5.2.1 Dissemination activities, products and tools (M1-M36)*

- Create the official website and ensure the presence of VISCA online (e.g. WineTech network, European Innovation Partnerships online market place, RuralCat platform, Pan European Phenology network PEP725, European Water Partnership, WssTP website, Spanish Platform of Water Technology, social media, partners' websites, etc.).
- Participation at dedicated events such as conferences, exhibitions, workshops and seminars at national, EU and international levels. VISCA intends to participate in at least 3 international exhibitions (with booths) as well as other conferences and seminars.
- Creating promotional materials in a visually-appealing way distributed within the Consortium, and spread by the project partners during conferences and other events. These materials include:
  - Printed materials: brochures (at least 3000 copies in English), posters (at least 4 posters: 1 in English, 1 in Italian, 1 in Spanish and 1 in Portuguese), roll-ups (1 photo-based, 1 text-based) and a factsheet.
  - Digital materials: presentations, newsletters (4), case studies and a short video.
  - At least 3 press releases around the user workshops and the final event
  - At least 3 articles published

#### *Subtask 5.2.2 Organisation of workshops at demonstration sites (M01-M30)*

Organization of 2 workshops targeting vineyards companies, irrigation communities, advisory board members (representing potential users from different sectors), policy makers, legislations bodies, etc:

- The first workshop will be held at M04 where project's end-users and stakeholders will be invited to collect end-users requirements (Task 3.1)
- The second workshop will be held at M30 (in parallel with the second general meeting), where results and outcomes of the first year of demonstration will be presented, open to anybody but primarily directed at main stakeholders and end-users, mainly to gather information about replicability, barriers, and policy assessment.

Objectives: ensure that products and services set-up by the project fulfil user needs, disseminate project outcomes and explore the exploitation possibilities of VISCA tool as well as its innovation and added value. Results from the demonstration sites, and similar cases where the technology can be applied will be discussed with stakeholders.

#### *Subtask 5.2.3 Organisation of final conference (M30-M36)*

The final conference will present the results and outcomes of the complete project. It will also hold the final workshop which will be in particular directed to the main stakeholders. During the final workshop, participants will be encouraged to cooperate in defining the necessary steps for enhancing VISCA exploitation after the project. VISCA final conference will be open to all stakeholders where remote participation or web streaming will be facilitated in particular for targets outside EU. Finally, the final conference might be joined with a larger event to ensure the participation of a large(er) audience.

### **Task 5.3. Exploring replicability and EU funding mechanisms for further deployment**

**Duration:** M01-M36

**Participants:** SEMIDE (leader), all partners

The aims of this task are twofold:

- on one hand, evaluating the potential application of VISCA results to other sectors such as (olive oil, rice, cereals, etc.) and in other territories in Europe and beyond; This will mainly be carried out during the second workshop involving Advisory Board members representing user groups not directly involved in the project, as well with interviews during external events related to sustainable agriculture and food security;
- on the other hand, exploring links and synergies with EU Programmes and Funds that could support the deployment of project results or further developments or demonstration if required for replicability in other sectors. Initial contacts and follow up mechanisms will be implemented in order to set up early links with:
  - Partnership for Research and Innovation in the Mediterranean Area on agriculture and water

(under preparation) (PRIMA)

- National and regional authorities in charge of Structural Funds, including Regional RIS3
- EU Joint Programming Initiatives, in particular FACCE JPI (Agriculture, Water, Food Security and Climate Change),
- National programs for increasing the demand side for innovation, such as ‘Innovative Public Procurement’
- European Agricultural Fund for Rural Development (EAFRD)
- Complementary funding mechanism for demonstration and close to market replication as Life.
- Transnational or interregional EDRF programmes
- Water Innovation financing facility (under preparation)

This task will be led by SEMIDE with contribution from all the partners especially who will explore other instruments for boosting the adoption of innovative solutions as well as to give continuity to VISCA results after the termination of the project.

#### **Task 5.4. Exploitation**

**Duration: M15-M36**

**Participants: ALPHA (leader), all partners**

This task aims at fostering VISCA adoption in the market, identifying the key elements to prepare a realistic business plan for further solution uptake and commercialization. To this extent, the following actions are envisaged:

- Market analysis and competitive assessment to identify market segmentation, market trends (both historical and expected), as well as key opportunities and threats for the VISCA solution. The market analysis will be coupled with an environment assessment, a value chain analysis and a preliminary pricing strategy definition to support an effective go-to-market strategy;
- Risk analysis to map the main economic and non-economic risks linked to VISCA uptake and identify main actions to avoid/mitigate them;
- Overall Business Plan definition quantifying key assumptions, over a 5 to 10 years period, to obtain a long-term cash-flow prediction and define a concrete exploitation strategy.

#### **Deliverables**

**Deliverable 5.1: Project website (M03)**

**Deliverable 5.2: Communication and Dissemination plan (M06)**

**Deliverable 5.3: Business Plan for exploitation (Issue 1) (M18)**

**Deliverable 5.4: Report on replicability and associated funding mechanisms (M20)**

**Deliverable 5.5: Report on the project workshops (M36)**

**Deliverable 5.6: Business Plan for exploitation (Issue 2) (M36)**

#### **Milestones**

**Milestone 5.1: First workshop of VISCA on end user's requirements (M04)**

**Milestone 5.2: Market analysis and competitive assessment (M18)**

VISCA's market analysis will be presented, coupled with an assessment of key competitors and a preliminary pricing strategy to support an effective go-to-market strategy

**Milestone 5.3: Second Workshop of VISCA on replicability and policy assessment (M30)**

**Milestone 5.4: Overall Business Plan presentation (M36)**

VISCA's go-to-market strategy will be fine-tuned and used as starting point to decline a customized Business Plan for the proposed solution



**Table 3.1.b: List of Work Packages**

Work Package Number	Work Package Title	Lead Participant Short Name	Person-Months	Start Month	End Month
1	Project Management	MET	69	01	36
2	Climatic & Agricultural Data	BSC	90	01	36
3	Climate Service and Mobile Application	ISMB	82,5	01	24
4	Demonstration	IRTA	219	02	36
5	Exploitation and Dissemination	SEM	86	01	36
			<b>546,5</b>		

**Table 3.1.c: List of Deliverables**

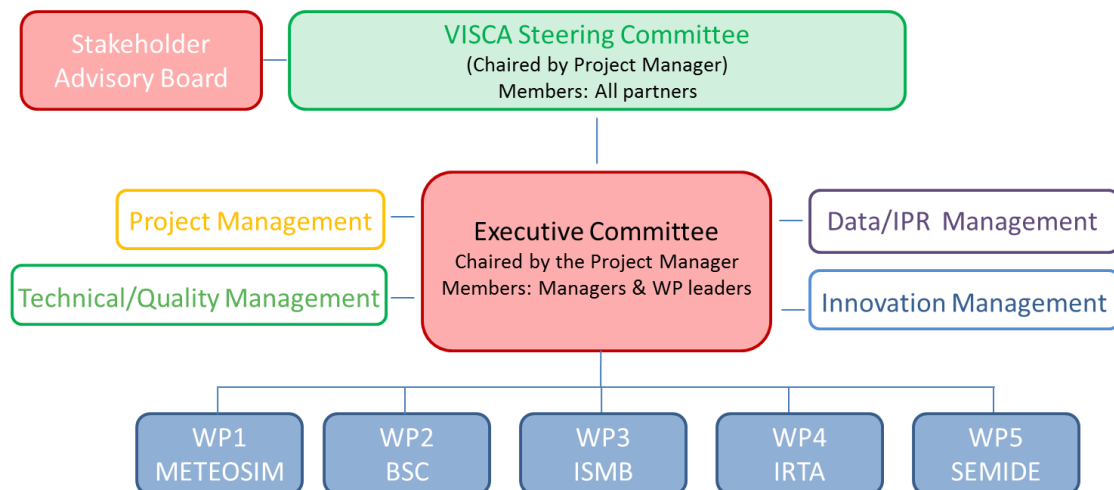
Deliverable (number)	Deliverable Name	Work Package Number	Short Name Lead Participant	Type	Dissemination Level	Delivery Date
D1.1	Kick-off meeting report	WP1	MET	R	PU	M02
D1.2	Risk management plan	WP1	IRTA	R	CO	M06-12-18-24-30
D1.3	Data Management Plan	WP1	SEM	R	PU	M06
D1.4	Innovation Management Plan	WP1	ALPHA	R	PU	M06
D1.5	Final report	WP1	MET	R	PU	M36
D2.1	Seasonal forecast predictions quality assessment report.	WP2	BSC	R	PU	M12
D2.2	Report on weather forecast extreme events	WP2	MET	R	CO	M12
D2.3	Report on the performance of phenological models	WP2	IRTA	R	CO	M12
D2.4	Report on the performance of irrigation requirements model	WP2	IRTA	R	CO	M12
D2.5	Decadal projection performance report	WP2	MET	R	PU	M24
D2.6	Report on coordinated seasonal forecast – phenological – irrigation requirement models for real-time applications.	WP2	IRTA	R	CO	M36
D3.1	End-User requirements	WP3	COD	R	PU	M04
D3.2	Technical specifications	WP3	BSC	R	PU	M08
D3.3	Decision Support System	WP3	ISMB	OTHER	CO	M12
D3.4	Mobile application	WP3	ISMB	OTHER	CO	M12
D4.1	Pilot Plots Implementation Report	WP4	IRTA	R	CO	M06
D4.2	Report on Calibration process	WP4	IRTA	R	CO	M14
D4.3	Report on 1 <sup>st</sup> year DSS Applications	WP4	IRTA	R	CO	M25
D4.4	Assessment of DSS feasibility according to	WP4	MET	R	PU	M34

	projections on climate change in 3 Mediterranean regions					
D4.5	Report on 2 <sup>nd</sup> year DSS Applications	WP4	IRTA	R	CO	M36
D4.6	Main Barriers and Solutions found on the DSS application	WP4	IRTA	R	PU	M36
D5.1	Project website	WP5	SEM	DEC	PU	M03
D5.2	Communication and Dissemination plan	WP5	SEM	R	PU	M06
D5.3	Business Plan - 1	WP5	ALPHA	R	CO	M18
D5.4	Report on replicability and associated funding mechanisms	WP5	SEM	R	PU	M20
D5.5	Report on the project workshops	WP5	SEM	R	PU	M36
D5.6	Business Plan - 2	WP5	ALPHA	R	CO	M36

### 3.2. Management structure, milestones and procedures

Multidisciplinary is a key feature of the project, and therefore coordination needs a team approach. The project management structure is presented in Figure 15, and it is designed to promote the strategic as well as the operational tasks of the project, i.e. decisions, technical execution, dissemination, data, IPR, innovation and administrative/financial tasks.

The management structure will have a strong focus on objectives and milestones, risk and innovation. The management structure consists basically of the Steering Committee as the strategic body, and the Executive Committee as the operational/execution body. A Project Advisory Board designated within the first month of the project will give advice and recommendations on the project progress, as well as favouring the replicability of VISCA among other sectors.



**Figure 15. Management structure of VISCA**

#### 3.2.1. Robustness and Appropriateness of the Management Team

Responsibilities and constituents of the management structure as well as the basic tools and procedures to be used in the decision process are explained below for the main agents involved in VISCA:

The decision-making process has been planned to reduce delays and uncertainties and it is expected to function in an efficient way. The decisions are to be the result of the inputs received from the different agents involved,

from the upper to the lower-decision agents of the project, where the troubleshooting is envisaged to be escalated and transversal, in order to stimulate communication among the different levels of the management structure.

The project coordinator (METEOSIM) will carry out management activities, which consists of the Steering Committee along with the Executive Committee, composed by several strategical managers. The Steering Committee will be responsible for the strategical decisions and for the engagement with the Advisory Board, while the Executive committee will be in charge of the operational project management.

The Executive committee is composed of several managers, each one with a specific focus and responsibility, as detailed in Table 9.

Both the Steering and the Executive Committees will be chaired by the Project Manager (PM), who is likewise responsible for liaison with the European Commission, coordinating the project activities of the Consortium members and for the production of deliverables respecting time, quality and budget constraints. The Project Manager, supported by the Executive Committee and by all WP leaders, will ensure day-to-day operational project control. The WP leaders will work very closely with the Executive Committee on all project's matters, and will be responsible for the work and the resource allocation at the partner level for the relevant management support activities.

**Table 9. Main Management actors in VISCA**

<b>Steering Committee</b>	<b>One representative per partner, chaired by PM</b>
<p>The main tasks of this committee are the management of the strategic aspects. The Consortium Agreement (CA) is the basic document that will regulate the responsibilities and the basic procedures to be followed at all stages of the project, and describes in detail the decision making structure. Major change decisions relating working plan, budget or consortium's situation are to be taken unanimously, and subsequently sent to the European Commission for approval. Other (lower importance) decisions are to be taken by consensus, and when this is not feasible, the principle of majority voting will be applied, and all partners shall have an equal vote. The implementation of the decisions determined by the committee will be managed by the PM.</p> <p>Frequency of meetings: they shall meet whenever it is necessary due to extraordinary situations that might take place, and minimum in every general meeting (M09, M18 and M30).</p>	
<b>Executive Committee</b>	<b>WP leaders, chaired by the PM</b>
<p>The Executive Committee is chaired by the Project Manager and is composed by the WP leaders, and the Technical/Quality Manager, Data/IPR Manager, and the Innovation Manager. This team has to ensure that the project follows the expected planning, timing and budget at all levels. They are in charge of reporting the technical and financial progress both to European Commission and to the Consortium.</p> <p>In parallel, they are responsible for the implementation of the decisions made by the Steering Committee. This Committee will meet on a 6-months basis, and whenever it is considered necessary due to extraordinary situations that might take place during the course of the project. These meetings will be held either in-person or through telephone/videoconferences meetings, to monitor the progression of the WPs – according to the agreed timing and budget-, the course of deliverables and milestones, and the use of the allocated resources. This Committee is likewise in charge of the preparation of internal reports, indication of delays or potential risks or deviations –and the suggestion of ideas or solutions to these-, and, at administrative level, they are responsible for the circulation of the agenda and the consolidation of the minutes.</p>	
<b>Project Manager (PM)</b>	<b>María Navarro (METEOSIM)</b>
<p>The Project Manager shall ensure the smooth running of the project, avoiding bottlenecks, promoting a close collaboration between the strategic and operational levels, and ensuring that deadlines are accomplished, and work carried out with maximum quality. She will review all documents referring project status, progress, planning, contents for relevant publications, deliverables and reports, etc. before their circulation within the consortium frames and their further submission to the European Commission. The main interfaces of the project manager are: (i) EC (Project Officer), extensively working by mail and</p>	

audio/video conference calls, physical meeting in case of planned events; (ii) Innovation manager, Technical manager, Data Manager and WP Leaders, extensively working by mail and audio/video conference calls (both on a periodic basis, e.g. monthly, and in case of need), physical meeting in case of planned events; (iii) the Steering Committee, with meetings held by audio/video conference call.

In parallel, the PM will be responsible for the administration of the internal Consortium structure and the financial administration of the project, including ensuring the proper completion and consolidation of the cost claims for partners.

Maria Navarro is R&D Manager at METEOSIM S.L. Maria holds a PhD degree in Chemical Engineering and she is specialized in environmental. She has worked in several environmental fields, such as waste water treatment and management, monitoring of pollutants, as well as recovery and upgrading of residues of different nature. With a broad experience in R+D as project researcher and coordinator, she has participated in several national and European projects (FP6 and FP7). She has worked in academia, research centres and private companies in several European countries –Spain, Germany, The Netherlands, Norway and United Kingdom. Currently she is project manager of the FP7 project WEAM4i ([www.weam4i.eu](http://www.weam4i.eu))

<b>Technical and Quality Manager</b>	<b>Joan Girona (IRTA)</b>
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The Technical Manager (TM) will have the responsibility of the overall coordination of the project's technical progress. The main tasks of the TM will be to secure the continuous alignment of commonly understood and agreed project results with the projects vision and the overall technical objectives. The TM will report to the Project Manager, supported by the WP Leaders. In parallel, the TM will lead the quality assurance procedures for the whole project, collecting and considering the recommendations and the advises of the Advisory Board. As quality manager, he will be likewise in charge of monthly monitoring and support telcos with partners to periodically update the quality assessment.

Joan Girona has been a researcher at IRTA for more than 30 years. His main interests are related to irrigation management under conditions of limited water availability, the seasonal sensitivity of woody species to water deficits, and how to apply these approaches in commercial orchards and vineyards. As technical.

<b>Innovation Manager</b>	<b>Emiliano Spaltra (ALPHA)</b>
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The Innovation Manager (IM) will have the responsibility of governing the innovation management process that will be implemented by adopting a hybrid research and innovation methodology. He will iteratively consider the evolution of products and market demands in the emergency sector, the business strategies of the large, small and medium enterprises present in the consortium, and the results achieved in order to adjust project objectives and requirements, specifying the innovations on which VISCA should focus more and identifying exploitation potentials.

Emiliano Spaltro is ALPHA's Director. He holds a degree cum laude in Business Administration and a second degree in Law. Moreover, he is a certified international investment analyst (CIIA) and a certified EFFAS financial analyst (CEFA). He has worked in leading consultancies (Roland Berger, Stern Stewart, Ambrosetti and LEK), following pan-European transportation, tlc, space and IT projects.

<b>Data and IPR Manager</b>	<b>Eric Mino (SEMIDE)</b>
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The data manager he will ensure that all the data will be stored in a project database. As Data Manager, he will be in charge of: Information Model, Data Access and Distribution, Data Protocols, Data Collection, Deposit and Quality Control, Access Protocols, Data Maintenance, Persistence and Archival Practice, Infrastructure and Requirement and Data Security.

As IPR manager, he will also handle the issues related to IPR affairs: IP identification, IP protection, IP management and IP conflicts handling.

Eric Mino is a Computer Science Engineer with 25 years of experience in project management. Strong knowledge and network of contacts with water authorities, basin agencies, European Commission, EEA and international institutions. Good knowledge of WFD and water directives, INSPIRE, SEIS, WISE and UN water accounting. Relevant experience in water quality and quantity monitoring networks, remote sensing, monitoring data collection and indicators development.

<b>Work Package Leaders</b>	<b>(MET, BSC, ISMB, IRTA, SEM)</b>
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The WP leader will be selected internally by the members of the consortium, based on their technical

knowledge and expertise. They are responsible of the execution of their assigned work packages and related tasks and deliverables. They shall report the Project and the Technical Managers about any extraordinary events that may affect the quality or the timing of the projects. More specifically, they will be responsible for:

- The internal coordination of their respective work packages (monitoring, planning, review and reporting).
- Assure that the WP tasks are being executed according to the agreed timing and budget.
- Report on a regular basis to the project coordinator, and maintain contact with the rest of WP leader.
- Designation of the task leaders and their coordination.

The WP Leader follows the guidelines established in the description of the Work Packages of the project, and the technical decisions taken by the Executive Committee. Any relevant resolution taken by the Steering Committee will be communicated by the Project Manager during the course of the Executive meetings. Additionally, they will report to the Technical Manager any deviation or potential risk encountered during the execution of their work packages.

Regarding their work in WP4, WP leaders will be the demosite leaders for their respective locations (UNAP in Italy, IRTA in Spain and UOPORTO in Portugal). The demosite leaders will be responsible for the implementation, customization and validation of the platform in their respective demosites. They shall report the technical coordinator of any deviation encountered during the execution of WP4 in their demosites.

### **3.2.1.1. Management tools**

#### **Quality Control and Risk Assessment**

A set of parameters or key performance indicators will be described by the Technical Project Coordinator with the support of the Executive Committee, in order to carry out the quality control and risk assessment. **The risk assessment will imply the monitoring of the technical risks and the subsequent implementation** –if needed- of risk mitigation policies or contingency plans, previously approved by the Executive Committee. The quality control will involve the monitoring and the update of the project indicators, the consolidation and submission of contractual reports, ensuring that the person-months and budgets are congruent with those previously claimed in the proposal. In parallel, the committee will also monitor and make sure that the results achieved are in concordance with the defined **quality requirements and follow the objectives defined in the project**. If any deviation is found, adequate corrective actions or contingency plans will be put in place. Every management or decision level will cope with the problems and solve the risks occurring at their own levels, following the escalation troubleshooting defined in VISCA structure. In those cases, where remarkable problems are encountered, therefore reporting always to the next level. Regarding the issues and problems related to the consortium as a whole, the Steering Committee will report (through the Project Coordinator) to the European Commission any problems concerning the entire partnership, such as severe delays, financial matters, contract matters, or necessary changes of partners. Project risks will be managed (and shared between partners) using a Risk Management tool included in the collaborative area created for the VISCA project.

#### **Project collaborative tools**

The Project coordinator, MET, will deploy a collaborative website (INTRANET), based on extranet MS Sharepoint services (or similar), in order to facilitate the coordination between partners and sharing the relevant information. The collaborative tools will include services as: shared documents, shared calendar, news publication, tasks and issues tracking, risk management, WiKi pages for sharing knowledge, discussion forums, follow up commercial opportunities, etc.

#### **Data Management**

A Data Management Plan will be available from M06 of the project. This plan has as main objectives to make data available to research and industrial communities. To achieve this goal, data will be released in open formats, paying attention to security issues that may affect certain set of data (e.g. links with external data). Data will be stored in a project database, to which partners will have secure access through the collaborative tool of VISCA.

## **Innovation Management**

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The European Standard containing the market consensus on the proper way to develop Innovation Management is the Technical Specification CEN/TS 16555-1, based, among other documents, on the Spanish standard of Management standard for R&D&i, UNE 166002 published by AENOR in 2006. VISCA is envisaged to follow the mentioned European Standard for Innovation Management, CEN/TS 16555-1, considering the following aspects:

- Understand the organization context
- Establishment of leadership and Manager commitment
- Planning of a successful innovation
- Identification and promotion of those factors that facilitate the innovation
- Evaluation and improvement of the IMP (innovation management plan) performing
- Understanding and application of innovation management techniques

## **Intellectual Property Management**

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The IPR and exploitation issues will be handled by the Innovation Manager who have extensive experience in such matters, and who will, furthermore, have access to internal and external specialists in patent and legal affairs. In addition, most other partners have their own legal departments and specialists. Formal consensus on management of IPR will be handled through a Consortium Agreement. In the project management work package, a strategy for knowledge management and protection will be developed based on the Consortium Agreement and the Commission recommendations on IPR management in Horizon 2020. The strategy will include the management of knowledge generated and / or collected during the project.

## **Communication management**

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VISCA possesses a well-defined internal communication structure specially created to maintain a fluid and thorough communication among the partners, with a view to obtaining the most efficient collaboration and increase the synergy for the sake of the quality of results. The main channel of the communication structure is the Project Coordinator, who will receive or prepare the information of different nature (reports, minutes, publications, patents and licensing processes, etc.) and is responsible of conveying this information to the rest of partners. Regarding the communication strategy for dissemination purposes, this was fully described in section 3.1 (WP5).

## **Decision-making process and conflict resolution**

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As a general principle, decisions are made at all levels and in all areas of the project's activities. For important decisions arising within the project, i.e., decision that affect more than one partner, a consensus should be achieved. The first step where to handle such consensus management is at the WP-level. If it cannot be found at this level, the work package leader must escalate the conflict to the Project Manager for resolution. If the Project Manager cannot find a solution satisfactory to all partners, the issue will be escalated to the level of the Project Board for a final decision. In case of a procedural question related to the EC, the Project Manager may, at his own will, raise the question to the Project Officer.

### **3.2.2. Engagement with stakeholders: Project Advisory Board**

A Project Advisory Board will be set up during the first month of the project, and it will link the VISCA consortium with its broad network of members. The PAB will provide the consortium with advice on market opportunities and barriers, directives and regulations, standardization, and on international investment programmes related with agriculture adaptation strategies. The main tasks of the PAB will be:

- To ensure the link between VISCA and worldwide, European and national stakeholders
- To provide advice for the market assessment, the potential business models definition and the identification of the market barriers for VISCA platform.
- To advice on dissemination activities/material of the project developments and results among the consortium members and policy makers and other EU projects, etc.
- To study and evaluate the replicability of the tool within other agricultural sectors

To collect Advisory Board recommendations and advises, three stakeholders meetings (M04, M18 and M30) will be organized throughout the duration of the project. A number of relevant experts have already committed to



join the VISCA Advisory Board, and many of them have provided letters of intent, which are attached in an appendix<sup>88</sup> of this proposal.

**Table 10. VISCA'S Project Advisory Board**

Scope	Member	Sector	Representative	Letter
World	<a href="#">OIV</a> (International Wine Association)	Wine		NO*
Spain	<a href="#">INNOVI</a> (Catalan Wine Cluster)	Wine	Clara Santamaria Echaniz	YES
Spain	<a href="#">PTV</a> , (Plataforma Tecnológica del Vino)	Wine	Trinidad Márquez García	YES
Italy	<a href="#">Asso Enology</a>	Wine	Roberto di Meo	YES
World	<a href="#">WMO</a> (World Meteorological Organization)	Climate Change	Jose Camacho	YES
World	<a href="#">UNEP</a> (United Nations Development Programme) - Consultant	Climate Change	Noelia Jover	YES
World	<a href="#">IOC</a> (International Oil Council)	Olive oil	Abdellatif Ghedira	YES
Spain	<a href="#">AEMO</a> (Spanish Olive Association)	Olive sector	José M <sup>a</sup> Penco & Salvador Cubero	YES
Spain	<a href="#">CITOLIVA</a> (Olive Oil Technological Center)	Olive oil	Cristina de Toro Navero	YES
Italy	Aprol Campania (Olive Oil Organization)	Olive oil	Francesco Acampor	
Spain	<a href="#">DELTAMED</a> (Mediterranean Deltas Association)	Agriculture of Deltas (rice)	Manuel Masiá Marsá	YES
Europe	<a href="#">EEA</a> (European Environmental Agency)	Land Systems	Annemarie Bastrup-Birk	YES
Europe	<a href="#">JRC</a> (Joint Research Center)	Agriculture	David Wilkinson	YES

\*Fernando Alves, member of the consortium as director in SYMINGTON is part of the scientific committee of this association, thus they will be targeted at the beginning of the project

**The Project Advisory Board will be composed by the members indicated in the table above, plus the end-users participating in VISCA (CODORNIU, MASTROBERARDINO and SYMINGTON).**

### 3.2.3. Milestones

A list of milestones has been outlined, which serves as a tool to ensure the project quality. The monitoring of these milestones is an invaluable tool to identify potential deviations and apply corrective actions in order to achieve the expected results.

**Table 3.2.a: List of Milestones**

Milestone number	Milestone Name	Related Work Package(s)	Due Date (in month)	Means of Verification
MS1.1	Deployment of VISCA's web-based tool	WP1	M03	All partners using this tool as a daily routine for communication and documents sharing
MS1.2	First Advisory Board Meeting	WP1	M04	Minutes of the meeting circulated among the whole consortium
MS1.3	Mid-term review	WP1	M24	Review report submitted to ECAS Portal
MS1.4	Second Advisory Board Meeting	WP1	M30	Document gathering feedback from PAB on the replicability of VISCA in their respective sectors
MS1.5	Final Conference	WP1	M36	Minutes of the meeting circulated

<sup>88</sup> Annex I in Part 4&5 of the proposal

				among the whole consortium
MS2.1	Availability of weather forecast information for the 3 demo-sites	WP2	M08	Short-term data of extreme weather variables can be checked by end-users
MS2.2	Availability of seasonal forecast simulations for the diagnostic case of study	WP2	M12	Seasonal data of temperature and precipitation can be checked by end-users
MS2.3	Availability of calibrated Phenological and Irrigation Requirement models for the different demo zones and cultivars	WP2	M12	Data of phenological events and water needs can be checked by the end-users
MS2.4	Real-time seasonal-phenological forecast simulations	WP2	M15	Phenological models are providing information on phenological events using the seasonal data as input
MS3.1	DSS design review	WP3	M08	Minutes of the meeting on DSS review circulated among the whole consortium
MS3.2	First Release of the DSS	WP3	M12	Software tested
MS3.3	First release of the mobile application	WP3	M12	Application tested
MS4.1	First preliminary report between research teams, DSS developers and end-users on the first experiences of the application of the CS-DSS	WP4	M19	Report circulated among the whole consortium
MS4.2	Second preliminary report between research teams, DSS developers and end-users on a full year application of the CS-DSS	WP4	M31	Report circulated among the whole consortium
MS5.1	First workshop of VISCA on end user's requirements	WP5	M04	Preliminary system requirements and design available. User workshop report circulated among the consortium
MS5.2	Market analysis and competitive assessment	WP5	M18	
MS5.3	Second Workshop of VISCA on replicability and policy assessment	WP5	M30	Preliminary DSS feasibility on long-term projections and preliminary replicability assessment report circulated among the consortium
MS5.4	Overall Business Plan presentation	WP5	M36	D5.6 validated by the whole consortium

### 3.2.4. Identification of Risks

The identification of the critical (or non-critical) risks acts as a part of the quality control and risk assessment of VISCA, due to the fact that it helps to set up appropriate mitigation measures. The identified risks will be monitored throughout the project and discussed during the meetings. Each identified risk will be assigned to a responsible, and mitigation and contingency plans will be defined. This process entails the identification and



prioritization of risks and the application of the necessary resources to mitigate the impact of unfortunate consequences. Risks include project failures (at any phase in design, optimization, etc.), organizational issues or events of uncertain or unpredictable root-cause, etc. Table 3.2.b reports a preliminary (non-exhaustive) list of potential risks affecting the achievement of VISCA objectives. The content of this table is intended to be the starting point for the preliminary risk management plan to be carried out in M06.

**Table 3.2.b: Critical Risks for Implementation**

<b>Description of Risk (indicate level of likelihood: Low/Medium/High)</b>	<b>WP(s)</b>	<b>Proposed Risk-Mitigation Measures</b>
Withdraw of an end-user, and consequently loss of a demo-site. (LOW) Unavailability of any of the operational demonstration sites, because of technical or organizational issues. (LOW)	WP1	Monthly monitoring and support telco with end-users
Slow response capacity to risks that may occur. (MEDIUM)	WP1	Shared Risk Management table (contingency and mitigation plan) in the intranet to be freely updated by all partners and monitored monthly by the Risk Manager
Delay on deliverable and milestone achievements (MEDIUM)	WP1	Continuous monitoring of the WPs activities, EFFECTIVE ALLOCATION AND PLANNING OF WORK
This project is an interdisciplinary initiative; people from different sectors will work together with a common objective. A proper communication of the strengths and weaknesses of each step/model in terms of uncertainty will be crucial for the proper development of the tool. (MEDIUM)	WP2	Several face-to-face meetings and teleconferences have been performed during the preparation of the proposal to properly adjust the different contributions. During the development of the project regular meetings will be established.
Availability of long-term historical observational data to apply statistical downscaling techniques. (HIGH)	WP2	End-users wineries involved in the project have their own observational stations and the consortium is in contact with related meteorological agencies. Besides this, the use of reanalysis will be also explored.
Data access related problems to real-time seasonal forecast. (MEDIUM)	WP2	The project tasks have been defined to take into account current plans of the Copernicus Climate Change Services. Besides this, the North American Multi-Model Ensemble which is freely available will be also used.
Chosen climatic model has high uncertainty (HIGH)	W2	Compare skill of climate and seasonal forecasts/projections
Presence of bugs in software modules (MEDIUM)	WP3 WP4	The test procedure will be automated to decrease bugs and integration period has been extended to solve as many bugs as possible
Poor coverage of cellular connectivity at pilot sites (HIGH)	WP3	The consumption of bandwidth will be minimized by strongly leveraging of data compression and by selecting bandwidth efficient protocols.
A climatic disaster (hail and frost, basically) or other disaster (fire, earthquake, etc) functionally destroys any plots where tests are conducted (LOW)	WP4	Commercial test plots where the applications will be fully tested, will be replicated on different locations to have diverse scenarios and also to prevent these type of risks.
Temporary unavailability of field data sensors from a pilot site (MEDIUM)	WP4	Daily check of data obtained from the sensors and then detect the incoherencies/errors

Data retrieving from end users at the demonstration sites affecting the timing of the project (HIGH)	WP4	Monthly monitoring and support telco with end-users
In-depth knowledge of the physiological and climatic models that apply (LOW)	WP2	The cluster and synergies created between 3 demo core groups performing parallel activities in three different countries will favor the availability of info among the partners.
Estimation of the workload required for data production and validation (MEDIUM)	WP2 WP3 WP4	Design of specific calendars where all the partners participating in these tasks will be available and ready to act on the production and validation. Providing feedback on the validation through.
Time frame limitations: Linking the predictions with the vineyard lifecycle (HIGH)	WP2 WP4	Meeting held among end-user-research centre-weather forecast provider to validate the forecasted models and link it with the vineyard lifecycle. Monthly monitoring and support telco with end-users
Simplicity and usability of the tool will determine the adoption of it by large industry and small producer (LOW)	WP3	The tool will be co-designed with the end-users and tested on the field with the farmers.
Stakeholders are not engaged with the activities and outcomes of the project (MEDIUM)	WP5	Ensure effective two way communications with the stakeholders during the events and through the different dissemination channels used by VISCA consortium. Interested end-users are part of VISCA consortium already.
Incompleteness of the data retrieved to perform the business plan (HIGH)	WP5	Use several data sources, such as Consortium expertise, interviews to industry players, experts and end-users, several secondary sources (e.g. market reports, online DBs....).
Business Plan reveals failure of market potential (MEDIUM)	WP5	Address market potential and road to market with strong interaction with end-users
Poor commercial exploitation (MEDIUM)	WP5	Exploitation actions designed with the support of key players already present in the market and aware of main market needs

### 3.3. Consortium as a whole

VISCA consortium is composed of 11 partners from 5 European countries (Spain, Italy, Portugal, France, and United Kingdom), being 3 of these countries included in the list of most important wine producers in the world and highly sensitive to climate changes (Spain, Italy and Portugal, occupying the 1<sup>st</sup>, 3<sup>rd</sup> and 7<sup>th</sup> position respectively). All partners together provide the necessary range of expertise, competence and operational capacity to deliver the innovative project objectives. Moreover, a large number of external experts are included in the Advisory Board, representing organizations from the wine, olive oil and agricultural sector, which will ensure replicability of the tool to other sectors (mainly mediterranean, high-added value agricultural products), and therefore its commercialization to the mentioned sectors beyond the life time of the project.

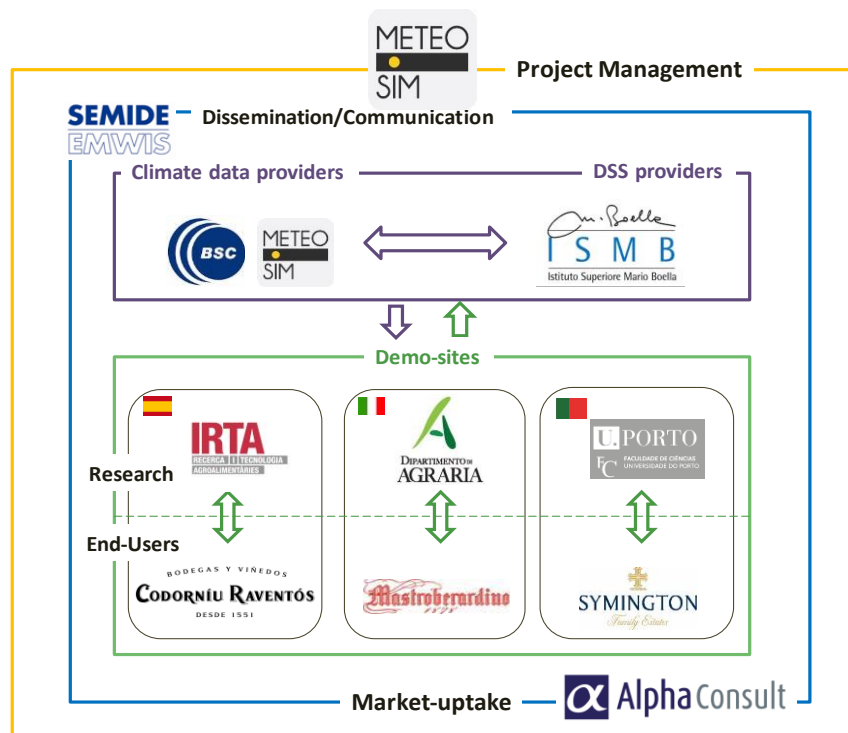
The consortium involves: **3 SMEs** (METEOSIM, MASTROBERARDINO, ALPHA), **2 large industries** (CODORNIU, SYMINGTON), **5 research centers/Universities** (IRTA, ISMB, BSC, University Napoli and University Oporto) and **1 non-profit organization** (SEMIDE). The equilibrium between industrial and research partners, together with the demonstrated expertise of these, will guarantee that the project will innovate and fully deliver the promised services and products, achieving all objectives with high impact. Further, the high number of industrial partners assures a real orientation towards the business exploitation of the project results. **Figure 16** shows that both the staff effort of VISCA is well balanced among the different nature of the beneficiaries involved, showing a higher specific weight on SMEs and industries (enterprises), due to the clear commercialization and market uptake goals at which the project aims.

VISCA's partner structure has been designed to work on **three demonstration sites located in the South of Europe** (Spain, Italy and Portugal), sensitive to climate change due to increase of temperatures and droughts, and where most of the wine production is concentrated, therefore an area that will demand adaptation strategies to be able to sustain its important viticulture industry. There will be 3 core groups (Spain, Italy and Portugal). Each of the core demo sites will be composed of:

- 1 End-User (wine company), acting as end user and codesigner of the tool: **Codorniu** from Spain, **Mastroberardino** from Italy, and **Symington** from Portugal. The service supplied by VISCA will grant the wine companies with business support strategic services to allow for the sustainability of their activity in the medium and long term, beyond the project life time.
- 1 Research entity (research center, university or SME): **IRTA** from Spain, **University Napoli** from Italy and **University Oporto** from Portugal. These will work together with the wine company in order to supply phenological and irrigation models based on the climatic data. Every Research entity belongs to the same country than the end-user, and it is geographically close enough as to being able to work in close cooperation in a daily basis.

Besides the close cooperation between end-user and research entity in every demo group, **the research entities will act as demo site leaders** in their corresponding countries. As commented before, the demo site leaders will be responsible for the implementation, customization and validation of VISCA in the respective

demosites granted by the end-users. The cluster composed by the 3 wine company and research entity cores will create a positive synergy, due to the direct and parallel exchange of data between them and the suppliers of climate modelling/simulation (**METEOSIM**, **BSC**) and software/interface modules (**ISMB**, **METEOSIM**), the latter being in charge of the integration of the different modules of the tool. The DSS designer (**ISMB**) will receive from the core demo groups irrigation, phenological and end-user requirement information, and from the climate/weather data providers they will receive the information regarding seasonal forecast, extreme events in short term, as well as historical and long term projections from **BSC** and



**Figure 16. Consortium structure and interconnections**

**METEOSIM.**

Every demo core groups will receive the information through VISCA tool, and in return they will feed the CS-DSS with outcomes obtained after the application of crop planning according to the tool outcomes. The latter, together with historical data, will be used by the software developers (**ISMB**) to improve the accuracy of the tool, by means of machine learning and by the validation of the climate service (CS) models from suppliers. In parallel, VISCA will disseminate and communicate the project objectives and outcomes to the targeted audiences (**SEMIDE**), in order to focus on a market-uptake of the final product (**ALPHA**). These partners belonging to France and UK respectively, will enrich the general Mediterranean culture of the project, besides contributing with their professional experiences in Dissemination/Communication and Market up-take. As a guarantee of the commercialization of the final product, 3 end-users belong to the consortium (**CODORNIU**, **MASTROBERARDINO**, **SYMINGTON**), who will test/validate the tool at their own sites.

### 3.4. Resources to be committed

**Table 3.4.a: Summary of staff effort**

	WP1	WP2	WP3	WP4	WP5	Total Peron/Months per Participant
MET	30	25	10	11	8	84
BSC	1	32	2.5	12	2	49.5
COD	6	2	6	24	6	46
IRTA	8	8	4	48	6	74
ISMB	5	2	36	6	4	53
UNAP	1	6	9	53	3	72
MAST	2	0	9	36	8	55
SYM	1	3	2	18	4	28
UORTO	0	12	3	11	2	28
SEM	9	0	1	0	13	23
ALPHA	6	0	0	0	30	36
Total PMs						<b>546,5</b>

**Table 3.4.b: Other direct cost items**

<b>MET</b>	<b>Cost (€)</b>	<b>Justification</b>
Travel	45,400	Travels for general meetings, workshops, demo-sites, conferences. Expenses for the travels of the Advisory Board to workshops and Project Advisory Board Meetings
Equipment	18,000	3 servers (6,000 €)= per demo site (nodes with processors Intel Xeon 2680 v3 of 12 cores (24 threads) and 64 GB RAM)
Other goods and services	0,0	
<b>Total</b>	<b>63,400</b>	

<b>IRTA</b>	<b>Cost (€)</b>	<b>Justification</b>
Travel	37,000*	Travel to Spanish demo site; international travel to demo sites in PT and IT; international congresses; car renting
Equipment	14,940	Computer & Software for modelling; pressure console for plants
Other goods and services	41,694	lab reactivities, drying of vegetal material, calibrations, aerial images processing, software licenses and "Cloud" servers; publishing costs; subcontracting for vegetal tissues and soil analysis
<b>Total</b>	<b>93,634</b>	

<b>UNAP</b>	<b>Cost (€)</b>	<b>Justification</b>
Travel	27,500*	Travels to the Italian demo site; international travel to demo sites in PT and SP; international congresses; car renting
Equipment	21,000	Computers and Softwares for modelling; pressure chamber for plants, irrigation scheduler, water meters, and GPRS modules for data transferring
Other goods and services	25,000	lab reactivities, drying of vegetal material, calibrations, software licenses and "Cloud" servers; publishing costs
<b>Total</b>	<b>73,500</b>	

\*Travels of Research centers/Universities result high due to the fact that Most of the work described in Tasks 2.3, 2.4, 4.1 and 4.2 require highly frequent trips to the commercial and experimental field plots located around 30 km from the IRTA Labs in Lleida. As a whole (WP2 and WP4 described tasks) will cover 3 years, the important controls and measurements have to be done in around 40 weeks/year, and during these periods almost a daily visit to the experimental area is scheduled, taking into account that different activities will be active simultaneously.

<b>COD</b>	<b>Cost (€)</b>	<b>Justification</b>
Travel	3,000	Travels to meetings, congresses, workshops and relevant events
Equipment	8,400	Pre-pruning and pruning machinery
other goods/services	29,100	after pruning treatments, irrigation and fertilization
<b>Total</b>	<b>40,500</b>	

<b>MAST</b>	<b>Cost (€)</b>	<b>Justification</b>
Travel	4,000	Travels to meetings, congresses, workshops and relevant events
Equipment	15,500	Computers; weather station sensors; mechanical trimmer
Other goods and services	19,000	Fertilizers, irrigation pipes, pesticides, small tools (pruning shears, harvest shears, fixes)
<b>Total</b>	<b>38,500</b>	

<b>SYM</b>	<b>Cost (€)</b>	<b>Justification</b>
Travel	5,000	Travels to meetings, congresses, workshops and relevant events
Equipment	15,000	Pressure Chamber (Scholander type); InfraRed Camera (temperature), weather station sensores
Other goods		
<b>Total</b>	<b>20,000</b>	

<b>SEM</b>	<b>Cost (€)</b>	<b>Justification</b>
Travel	18,660	3 general meetings, 1 workshop, (2 <sup>nd</sup> workshop organised with a general meeting), final conference - 2 persons for 2 or 3 days (€ 9,240) Participation to 3 exhibitions (2 pers for 3 days) and 4 networking events (1 pers. 2 days) (€ 9,420)
Equipment	0,00	
Other goods and services	14,500	Roll-ups / posters (€ 500) 2 workshops: meeting rooms, catering, local transportation (€ 10,000) Exhibition booths (€ 4,000)
<b>Total</b>	<b>33,160</b>	

### 3.4.1. Explanation of use of resources: subcontracting

	<b>Cost (€)</b>	<b>Justification</b>
<b>MET</b>	<b>8,900</b>	Financial audit (€3,000) + subcontracting of a share-point system for intranet collaborative tools (licence = €5,400, hosting = €3,500)
	<b>Cost (€)</b>	<b>Justification</b>
<b>COD</b>	<b>27,500</b>	An external company will perform the works related to crop forcing: pre-pruning, pruning, leaf removal, green pruning, treatments, irrigation, modification in the irrigation systems and harvesting.
	<b>Cost (€)</b>	<b>Justification</b>
<b>IRTA</b>	<b>5,100</b>	Lab analysis for soils and vegetative tissues specific parameters
	<b>Cost (€)</b>	<b>Justification</b>
<b>UNAP</b>	<b>5,000</b>	analyses of berry and wine composition and wine sensory properties at external departments and private companies
	<b>Cost (€)</b>	<b>Justification</b>
<b>MAST</b>	<b>12,000</b>	An external company will do the works related to vineyard management: pruning, green harvest, leaf removal, treatments, irrigation, modification in the irrigation systems, trimming, thinning of the grapes and harvesting
	<b>Cost (€)</b>	<b>Justification</b>
<b>SEMIDE</b>	<b>13,000</b>	Initial design and set up of website, server maintenance (€3,000) Euros), Design and printing brochures (€1,000), Preparation of a short project video (€10,000)



**Innovation action**

Horizon 2020

Call: H2020-SC5-01-2016

Topic: Exploiting the added value of climate services

Type of action: IA

Proposal number: 730253-1

Proposal acronym: VISCA



**VISCA**

*Vineyards Integrated Smart Climate Application*

**PART B**

**List of participants**

Participant No	Participant organisation name	Short Name	Country	Type
1 (Coordinator)	METEOSIM S.L.	MET	Spain	SME
2	Barcelona Supercomputing Center	BSC	Spain	Research Center
3	Codorniu S.A	COD	Spain	Industry
4	Institut de Recerca i Tecnologia Agroalimentàries	IRTA	Spain	Research Center
5	Istituto Superiore Mario Boella sulle Tecnologie dell'Informazione e delle Telecomunicazioni	ISMB	Italy	Research Center
6	Universita Degli Studi Di Napoli Federico II	NAP	Italy	University
7	Mastroberardino spa	MBD	Italy	SME
8	Symington - Vinhos S.A.	SV	Portugal	Industry
9	Universidade do Oporto	UPORTO	Portugal	Research Center
10	Unite Technique du Semide Geie	SEM	France	Non-profit org
11	Alpha Consultant	ALPH	UK	SME

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## 4 MEMBERS OF THE CONSORTIUM



### 4.1 Meteosim S.L

Participant Identification Code (PIC): 994783404

Partner website [www.meteosim.com](http://www.meteosim.com)

#### Partner Description

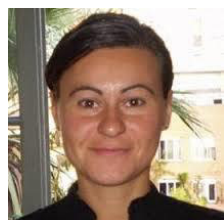
The project coordinator, Meteosim SL (MET), is a technological consulting SME that –through highly reliable meteorological forecasts- provides advanced numerical solutions to sectors and industries whose activities are weather-sensitive. Established in 2003 and located at the Barcelona Science Park (Barcelona, Spain), MET's main asset is the application of scientific knowledge, which provides valuable solutions to our clients on the basis of research and development with mesoscale and microscale weather forecast models.

#### Role in the project

Meteosim will participate in the VISCA project as coordinator and as WP1 leader. Furthermore, It will be involved in WP2 by providing climate information at multi-decadal time scale and weather forecast services for extreme events; in WP3 coordinating the data technical requirements definition and architecture design, participating in the data integration and coordinating the system integration task; in WP4 MET will participate in the calibration of the climatic models and in the DSS application tasks related with the climatic data; Finally, MET will participate in the tasks of dissemination and communication activities and as SME providing exploitation interests in WP5.

#### Key Personnel Involved

##### Dr. Maria Navarro (Female)



#### Position in Organisation

Head of Research and Development Department

#### Role in the project


Coordination of Meteosim team and tasks


#### Profile


María Navarro has worked on Coordination and Management of Research and Development projects since 2008. With a vast knowledge in several technical topics, María Navarro is PhD in Chemical Engineering and she gained international experience in R+D as scientist in research technological centers and companies of Germany, Netherlands and United Kingdom. A remarkable part of her professional career has been devoted to the preparation and coordination of national, interregional and European R+D projects. During the development of these projects she has been in charge of data analysis, reporting and presentation of the project to stakeholders in different events, as well as the last phases of the project. She has also worked as technical advisor and consultant in the water treatment field. She joined MET as RDi Manager in 2014, where she has been working on the management of European projects, writing of proposals and search of funding for R+D activities.


##### PhD M<sup>a</sup> Ángeles González (Female)



	<p><b>Position in Organisation</b></p> <p>Project Manager in the Air Quality Department in Meteosim</p> <p><b>Role in the project</b></p> <p>Responsible for the obtaining of the historical and long term projection dataset. Collect and analyse observational historical/reanalysis data.</p>
<p><b>Profile</b></p> <p>Mª Ángeles González is the Project Manager in the Air Quality Department in Meteosim. She holds a Degree in Physics (Univ. Complutense of Madrid, 2009), a Master in Geophysics and Meteorology (Univ. Complutense of Madrid, 2010) and a PhD in Physics (Univ. Complutense of Madrid, 2014). She was working in air quality modelling for five years in CIEMAT (Centre for Energy, Environment and Technology), where she was researching about air pollution and heavy metals with chemistry-transport models. Now she continues working in air quality projects, where she is responsible for the configuration, simulations and analysis of results obtained. She has high experience with meteorological numerical models, air quality and chemistry-transport models, and geographical information systems. Also, she has participated in several scientific publications and congresses.</p>	

<b>Ignasi Porras (Male)</b>	
	<p><b>Position in Organisation</b></p> <p>Project Manager in the Meteorological Risk Management Department</p> <p><b>Role in the project</b></p> <p>Responsible for the weather forecast model, data processing and assessment for the extreme events forecast over the considered regions.</p>
<p><b>Profile</b></p> <p>Ignasi Porras Alegre is the Project Manager in the Meteorological Risk Management Department in Meteosim. He holds a B.Sc. in Physics, M.Sc. in Meteorology and a M.Sc. in Aeronautical Management. He has an extensive experience in meteorology and atmospheric modelling. During his career he has worked on projects related to configuration and operational simulations of weather models as well as the analysis and interpretation of results. He has collaborated on projects related to weather, climate and marine operational simulations using numerical prediction models. He has worked in different European projects of the Seventh Framework Programme (FP7) and of the Horizon 2020 Program. He has implemented the data assimilation module in the operational meteorological simulations and participated in the treatment of meteorological observations. In turn, he has participated in a dozen scientific publications.</p>	

<b>Ing. Josep Maria Solé (Male)</b>	
	<p><b>Position in Organisation</b></p> <p>Project Manager of Climate Services at MET</p> <p><b>Role in the project</b></p> <p>Responsible for the evaluation of the historical climate model skill and analysis of the climate change signal.</p>
<p><b>Profile</b></p> <p>Josep Maria is Project Manager of Climate Services at MET; he has been participating in international projects over the last 4 years developing climate and meteorology tools and services applied to the fields of renewable energy, transport, meteorology, oceanography and climate change. He is Civil Engineer (Polytechnical University of Barcelona, 2010) and Master in Coastal and Estuary Management (Polytechnical University of Barcelona, 2011).</p>	

Miquel Picanyol Sadurní (Male)	
	<b>Position in Organisation</b> Product Manager at MET
	<b>Role in the project</b> Responsible for the System integration of VISCA components, its test and validation.
<b>Profile</b> Miquel is senior researcher at METEOSIM, with more than 10 years of experience on the use of mesoscale models. He holds a degree in Physics from the Department of Astronomy and Meteorology of Barcelona University, where he was working in different R+D programs during more than 3 years. He has been involved in different European and regional (governmental) projects.	
<b>Relevant Publications</b>	
1. Solé, J., Arasa, R. , Picanyol, M. , González, M. , Domingo-Dalmau, A. , Masdeu, M. , Porras, I. and Codina, B. (2016) <b>Assessment of Climate Change in Nicaragua: Analysis of Precipitation and Temperature by Dynamical Downscaling over a 30-Year Horizon.</b> <i>Atmospheric and Climate Sciences</i> , 6, 445-474. doi: <a href="https://doi.org/10.4236/acs.2016.63036">10.4236/acs.2016.63036</a>	
<b>Relevant Products</b>	
<ol style="list-style-type: none"> <li><b>Climate Change Models (2003):</b> MET has been delivering technology with proven experience in simulations of future scenarios using both Statistical &amp; Dynamic Downscaling methodologies, thus generating scenarios and relevant information that are essential to assess the consequences on projects where climate change is a key factor, and help in the long term decision process.</li> <li><b>Risk Management Weather Forecasting System (2003-2013):</b> MET has developed special system to predict the weather in local facilities to minimize the risk of damages and economic losses: <ul style="list-style-type: none"> <li><u>Mining</u>: weather forecasting for mining companies whose activity is at 3000 msl. (Developed in 2013).</li> <li><u>Highways</u>: Forecasting tool at road level with friendly functionalities for Highway management companies. (Developed in 2012).</li> <li><u>Water Dam</u>: System that integrates the rain forecasting to the management of the water dam. (Developed in 2007).</li> <li><u>Ski resorts</u>: Local and reliable weather forecasting for the management of the ski resort and the artificial snow production. (Developed in 2003).</li> </ul> </li> <li><b>Forest fire risk forecasting (2003):</b> This service combines high resolution numerical weather forecast models with specific risk simulation models such as the Canadian and BEHAVE forest fire risk models, allowing for the detection of risks in advance.</li> <li><b>Chemical Track Modelling (2014):</b> MET designed an emergency tool to track gas and particle emissions using HYSPLIT (Hybrid Single Particle Lagrangian Integrated Trajectory Model)</li> <li><b>Sailing weather forecasts (2007):</b> MET developed a sailing weather services oriented to general navigation near the coast and open sea, which provides clients with high resolution numerical weather prediction models and worldwide wave forecasts.</li> </ol>	
<b>Relevant Projects or Activities</b>	
<ol style="list-style-type: none"> <li><b>Impact of climate change on the hydro power potential of Costa Rica (main partner)</b>  <b>Funded by:</b> Madrid Community Regional Government (Spain).  <b>Years:</b> 2013-2015  <b>Description:</b> Analysis forecast of changes in rainfall over several selected river basins and a consequent change in the hydrological regime and water resources affecting hydro power future plans. </li> </ol>	

## 2. Development of adaptive capacity to Climate Change in the Transport Sector in Nicaragua

**Funded by:** Ministry of Transports and Infrastructures Nicaragua (MTI) - NDF

**Years:** 2015

**Description:** Analysis of the impact of climate change on the transport infrastructures of Nicaragua (main roads and highways at a National level) establish several adaptation pilot projects and design and deliver a comprehensive capacity building program

## 3. WEAM4i (coordinator)

**Funded by:** FP7-ENV-2013-WATER-INNO-DEMO

**Years:** 2013-2017

**Description:** Project aimed at improving the efficiency of water use and reducing the costs of power irrigation systems. Met run Numerical Weather Prediction Models with focus on rain, all maps and climatic data is integrated into the forecast module of the system.

## 4. Definition, Implementation and Monitoring of the Air Quality and Climate Change Strategy of Madrid (Coordinator and main partner).

**Funded by:** Madrid Community Regional Government (Spain).

**Years:** 2013

**Description:** Delivering projected emissions of compounds (pollutants) included in the Geneva Convention and GHGs to 2015 and 2020, and studies of emission baseline scenarios according to the European guidelines (CAFÉ) and international methodologies (IPCC)

## 5. I-REACT (partner)

**Funded by:** H2020

**Years:** 2016-2019

**Description:** It will be the first European-wide platform to integrate emergency management data coming from multiple sources, including that provided by citizens through social media and crowdsourcing. MET analyses existing outputs of global climate models over Europe, using a Regional Climate Model (RCM) to perform higher resolution simulations over specific areas of interest. Climate projections of significant variables affecting floods and wildfires will be studied for Europe, providing an overview of the general trends. Outputs from the high resolution RCM simulations will be statistically analyzed. The focus will be on meteorological fields relevant for floods and wildfires

## Significant infrastructure and/or major items of technical equipment

*Please describe any significant infrastructure<sup>1</sup> and/or any major item of technical equipment that is relevant to the proposed work. This section aims at demonstrating your organisation's operational capacity to carry out the activities you have been assigned.*

Out of the project Meteosim will increase the Cluster for run the models and adapt the output into the final system. The Cluster, located in a secure data room and properly acclimatized, is connected to an uninterruptible power supply and also with redundant power supply via. The infrastructure also have a high speed data files downloading network and also have an alternative connection through a redundant network card.

## Complementarities between partners

MET will provide its expertise providing long-term climatic data and end-users will provide feed-back on the visualization needs of these data. Researches centres will define which variables of climatic data are needed to run their models, which will help MET refine the projections of the variables. End-users will also provide information on possible new applications and uses that climatic data can have in the wine industry, and open new business opportunities.

<sup>1</sup> "Significant infrastructure" refers to anything you may use to carry out your tasks (e.g. major scientific equipment or set of instruments; knowledge based-resources such as collections, databases, archives or structured scientific information; enabling ICT-based e-Infrastructures such as Grid, computing, software and communication networks; any other entity of a unique nature essential to achieve excellence in research.)

## 4.2 Barcelona Supercomputing Center (BSC)



**Participant Identification Code (PIC): 999655520**

**Partner website** [www.bsc.es](http://www.bsc.es)

### **Partner Description**

**The Barcelona Supercomputing Center (BSC)** was established in 2005 and is the Spanish national supercomputing facility and a hosting member of the PRACE distributed supercomputing infrastructure. The Center houses MareNostrum, one of the most powerful supercomputers in Europe. The mission of BSC is to research, develop and manage information technologies in order to facilitate scientific progress. BSC combines HPC service provision, and R&D into both computer and computational science (life, earth and engineering sciences) under one roof and currently has over 450 staff from 44 countries. BSC has collaborated with industry since its creation, and participates in various bilateral joint research centers with companies such as IBM, Microsoft, Intel, NVIDIA and Spanish oil company Repsol. The centre has been extremely active in the EC Framework Programmes and has participated in over 100 projects funded by it. BSC is a founding member of HiPEAC, the ETP4HPC and other international fora.

The ES-BSC activities with the focus on global climate modelling and prediction are based on research, development and predictions with the EC-Earth climate forecast system. EC-Earth is the state-of-the art coupled climate model that is being developed and used for climate predictions and projections by the European consortium of more than 20 research and operational institutions from European Centre for Mid-range weather Forecasts (ECMWF is provider of the atmospheric and land components) to ES-BSC. Beside contributing to the 5th phase of the Coupled Model Intercomparison Project (CIMP5) critical for the UN IPCC Fifth Assessment Report (AR5), global climate research activities at ES-BSC enable provision of various historical reconstructions and initial conditions to the EC-Earth community for analysis of climate dynamics and for seasonal to decadal climate predictions. The ES-BSC is a contributor to the IS-ENES FP7 European project fostering the integration of the European climate modelling community and the development of Earth System Models (ESM) for advancing the understanding and predictions of climate variability and change. The ES-BSC is already active in the planning and design of the future coupled climate model intercomparison project, CIMP6, and is preparing to make key contributions including the groundbreaking high-resolution climate simulations with EC-Earth.

### **Role in the project**

For this project, the BSC undertakes research on the development and assessment of dynamical methods for the prediction of essential climate variables for the wine sector. The formulation of the predictions includes the development and implementation of techniques to statistically downscale, calibrate dynamical ensemble forecasts to satisfy specific user needs in the framework of the development of a climate service.

BSC will partner in WP 1, 2, 3, 4 and 5 where the following tasks will be carried out:




WP1: Define a protocol to produce climate forecast information compliant with the INSPIRE Directive requirements.

WP2: Coordinate the model chain work flow from the seasonal forecast predictions to the phenological and irrigation models. Produce real-time seasonal forecast predictions.

WP3: Integration of the essential climate variables within the system.

WP4: Produce and evaluate bias-corrected seasonal forecast simulations.

WP5: Develop communication material for stakeholders and for the scientific community.

Key Personnel Involved	
<b>Dr. Albert Soret Miravet (Male)</b>	
	<b>Position in Organisation</b> Head of the Earth System Services group
	<b>Role in the project</b> Coordinate WP2 activities. Integrate recent advances in climate predictions and provide essential climate indicators to the users. Implement the real-time application of seasonal forecast predictions.
<b>Profile</b> Dr. Albert Soret holds a PhD in Environmental Engineering from the Polytechnic University of Catalonia (Barcelona). He is the Head of the Services group at BSC-ES with 10 years of research experience in earth sciences. His research focuses on assessing the impact of climate on socio-economic sectors through the development of user-oriented services that ensure the transfer of the technology developed and the adaptation to a rapidly changing environment. He is the Work Package leader within the CLIM4ENERGY and MAGIC Copernicus projects. Between others, he is participating in EC-FP7, ERA-Net and H2020 projects: NEWA, EUPORIAS, SPECS, IMPREX and PRIMAVERA.	
<b>Dr. Nube Gonzalez Reviriego (Female)</b>	
	<b>Position in Organisation</b> Post-doc
	<b>Role in the project</b> Improve climate information by means of applying bias-correction methods and evaluate model results to communicate model predictability to facilitate the communication with the users. Develop communication material for stakeholders and for the scientific community.
<b>Profile</b> Nube Gonzalez joined the Climate Investigation and Application Group (GICA) of the USAL under a FPI fellowship, where she holds an international PhD in “Research and Development of Geotechnologies”. Her Doctoral Thesis, entitled “Evaluación de las teleconexiones climáticas observadas y simuladas con modelos de CMIP en la región Euro-Atlántica” focus on Northern Hemisphere Teleconnections with outputs of Global Climate Models (GCM’s) from CMIP3 and CMIP5 datasets. In 2013 she started to work at Institut Català de Ciències del Clima (IC3) in the Climate Forecasting Unit (CFU) where she was involved in the development and communication of climate services for energy. Currently, Nube is working at BSC, where her research topic is to understand the forecast quality and the predictability sources of the most comprehensive set of sub-seasonal and seasonal probabilistic predictions of wind speed and temperature. She contributed to various national and European projects as RESILIENCE or EUPORIAS among other.	
<b>Nicola Cortesi (Male)</b>	
	<b>Position in Organisation</b> Post-doc
	<b>Role in the project</b> Enhance the integration of seasonal forecast information within the model chain. Define formats and protocols to exchange the climate essential variables.



### Profile

Dr. Nicola Cortesi obtained a degree in Atmospheric Physics at Milan University in 2007. He holds a Master on Geographic Information Systems and interpolation techniques, and a Ph.D on modelling precipitation and temperature variability at Zaragoza University, followed by a postdoctoral on statistical downscaling at CERFACS (MeteoFrance) and a postdoctoral on multi-model ensemble evaluation at IC3 (Barcelona). He has eight years of experience in handling, analysing, assessing and visualizing large global and regional climate simulations and a very good experience in verification of S2S forecasting systems. He contributed to various national and European projects (SPECS, COST, RESILIENCE, CLIM4ENERGY, SECTEUR, FORALPS).

### Relevant Publications

1. Soret, A., González, N., Torralba-Fernandez, V., Cortesi, N., Turco, M., Doblas-Reyes, F.J. (2016). **Climate predictions for vineyard management**. *CLIMWINE 2016 International Symposium*. April 10-13, 2016. Bordeaux, France.
2. Pavan, V. & Doblas-Reyes, F.J. (2013). **Calibrated multi-model ensemble summer temperature predictions over Italy**. *Clim Dyn* 41: 2115. doi:10.1007/s00382-013-1869-7
3. Doblas-Reyes, F.J., J. García-Serrano, F. Lienert, A. Pintó Biescas and L.R.L. Rodrigues. (2013). **Seasonal climate predictability and forecasting: status and prospects**. *WIREs Climate Change*. doi: 10.1002/wcc.217
4. Guemas, V., F.J. Doblas-Reyes, I. Andreu-Burillo M. Asif. (2013). **Retrospective prediction of the global warming slowdown in the past decade**. *Nature Climate Change* 3, 649–653 (2013) doi:10.1038/nclimate1863.
5. Doblas-Reyes, F.J., Hagedorn, R., Palmer, T.N. (2006). **Developments in dynamical seasonal forecasting relevant to agriculture management**. *Climate Research*, 33:19–26

### Relevant Products

**Seasonal hurricane prediction system (2016):** Barcelona Supercomputing Center and Colorado State University in association with XL Catlin have launched a new website to track seasonal hurricane forecasts and the evolution of hurricane activity. Seasonal Hurricane Predictions brings together forecasts from major centers that specialize in Atlantic hurricane forecasting. It also offers extensive information to promote understanding of the factors that contribute to these meteorological phenomena, which can have devastating consequences, and to help explain why different seasonal forecast models can produce different predictions.  
<http://www.bsc.es/ESS/seasonalhurricanepredictions/>

### Relevant Projects or Activities

1. **Seasonal forecast predictions to be used within the MARS Crop Yield Forecasting System.**  
**Funded by:** Joint Research Center (JRC)  
**Years:** 2016  
**Description:** Testing and evaluating meteorological long-term forecast products based on the ECMWF long-term weather forecasts to be used within the MARS Crop Yield Forecasting System at JRC - Joint Research Centre of the European Commission
2. **PRIMAVERA: PRocess-based climate sIMulation: AdVances in high resolution modelling and European climate Risk Assessmt**  
**Funded by:** European Comission (H2020)  
**Years:** 2015-2018  
**Description:** Deliver novel, advanced and well-evaluated high-resolution global climate models, capable of simulating and predicting regional climate with unprecedented fidelity.

<p><b>3. IMPREX: IMproving PRedictions and management of hydrological EXtremes</b>  <b>Funded by:</b> European Comission (H2020)  <b>Years:</b> 2015-2018  <b>Description:</b> IMPREX will improve society's ability to anticipate and respond to future hydrological extreme events (floods, droughts...) in Europe. It will enhance forecast quality of extreme hydro-meteorological conditions and their impacts. The knowledge developed by the project will support risk management and adaptation planning at European and national levels</p> <p><b>4. SPECS: Seasonal-to-decadal climate Predictions for the development of European Climate Services</b>  <b>Funded by:</b> European Comission (FP7)  <b>Years:</b> 2012-2016  <b>Description:</b> SPECS will deliver a new generation of European climate forecast systems and provide an enhanced communication protocol and services to satisfy the climate information needs of a wide range of public and private stakeholders</p> <p><b>5. EUPORIAS: European Provision Of Regional Impacts Assessments on Seasonal and Decadal Timescales</b>  <b>Funded by:</b> European Comission (FP7)  <b>Years:</b> 2012-2016  <b>Description:</b> Produce reliable predictions of the impacts of future climatic conditions on different sectors such as agriculture and water management.</p>
<b>Relevant Patents</b>
<i>n.a.</i>
<b>Significant infrastructure and/or major items of technical equipment</b>
<p>The BSC hosts MareNostrum III, a Tier-0 PRACE system with 1.1 Pflop/s capacity as well as other High-Performance Computing (HPC) resources, which will be used by ESRs during their training in climate modelling to conduct their experiments. The BSC also coordinates the Spanish Supercomputing Network, which is the main instrument to grant competitive computing time to Spanish research institutions. The BSC is located within a university campus, and has special agreements to use the university residence and other university facilities (libraries, EDUROAM network, etc).</p>
<b>Complementarities between partners</b>
<p>To estimate future climate variability during the growing season, current user practices use the retrospective climatology, with an assumption that the past will also represent the future. Recent advances in climate predictions can provide a more informative view by modelling future conditions over future seasons. It has been demonstrated that seasonal forecast predictions can improve upon using climatology at some spatial and temporal scales, so decision makers now have a new set of climate risk management tools that can strengthen their decision making. However, climate predictions come with a new set of challenges for end users: information is often un-tailored and hard to understand or apply in a decision-making context.</p> <p>Users within the VISCA consortium will help BSC to understand user needs to co-design and co-develop a new realm of climate services and tools for the wine sector using climate predictions</p>

### 4.3 CODORNÍU, S. A.

**Participant Identification Code (PIC):** 934737494

**Partner website** [www.codorniu.com](http://www.codorniu.com)

#### Partner Description

Codorníu is a company dedicated to elaborate and distribute wines and sparkling wines with high added value. We're talking about the oldest company in Spain, with more than 5 centuries of trajectory. Codorníu have its own vineyards and more from other winegrowers to whom advice to control the production from the grape. This factor, added to a strong research work, assures the high quality of all Codorníu's products.

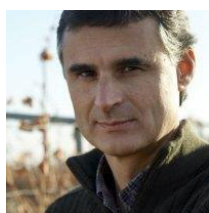
Codorníu is a family business with more than 1.000 employees around the world because the relevant of export in the last years as consequence of stagnant growth in Spain. Codorníu have seven wineries in Spain which represents the most relevant DO in our country. On the other hand, we have two more wineries in Argentina and United States. In the same way, Codorníu have subsidiaries to distribute our products in Asia (China, Japan, South Korea and Singapore), Europe (United Kingdom and Germany) and United States, our distributor, Aveniu Brands.

#### Role in the project

Codorníu will be the end user of the empirical model developed and will provide a demosite for the project. In particular Codorniu will participate in WP1, and will be actively involved in the design and developments of WP3 (Task 3.1 End-user requirements, Task 3.4 and Task 3.5 DSS development and visualization). Codorniu team will also participate in WP4. Demonstration, having a pilot site on their premises and working coordinated with IRTA's Team. Additionally, they will participate in WP5 on Exploitation and Dissemination tasks.

#### Key Personnel Involved

##### Joan Esteve (Male)



##### *Position in the organization*

Technical director of viticulture


##### *Role in the project*

Managing, planning and coordinating all research activities in the field project (plots). Defining strategies, monitoring the implementation thereof and analysis of final results.

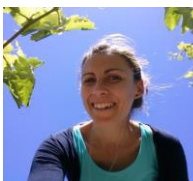
##### *Profile*

Agricultural engineer at ETSEA Lleida and M.S. Plant Science Master at California State University, Fresno with lot of specific education about enology and viticulture. More than 25 years of experience working in viticulture and more than 15 at Codorníu where he has developed lots of research tasks and projects to improve grape's quality.



Elisabeth Figueras (Female)	
	<b>Position in the organization</b> Head of enology and production
	<b>Role in the project</b> Implementing of testing irrigation, scheduling harvests and vinifications.
<b>Profile</b> <p>Elisabeth Figueras belongs to the fourth generation of a vinegrowing family who have been living surrounded by vineyards. She doesn't remember exactly when she was first introduced to the smells of grapes, only that she was a toddler. She learnt how to walk in the vineyards and since then she has always known that she was bound to work with grapes.</p> <p>When she got her Chemical Engineering degree, she realized that she needed to return to her true passion: the vineyards. So, she started to study Enology at the University of Tarragona and then moved to California to continue her career at Artesa Winery and then to Church Road Vineyards in New Zealand. Before starting to work in Raimat, she worked at different wineries from Penedes region.</p> <p>Working in Raimat makes her feel part of a big project, another cog in the wheel. <b>She feels responsible for providing a discussion topic in the table, a happy state of mind, satisfaction in Raimat's loyal consumers when they taste our wines.</b> Therefore, she and her team are responsible for providing small everyday stories.</p>	

Jordi Civit (Male)	
	<b>Position in the organization</b> Technical Support Raimat
	<b>Role in the project</b> Preparing, managing and monitoring of experimental plots studied at project.
<b>Profile</b> Agricultural engineer at Universidad de Lleida and Postgraduate in Geographical Information Systems for municipal and territorial management at Universidad de Lleida. Working at Codorníu for more than 15 years as Technical responsible of viticulture.	

Imma Pausas (Female)	
	<b>Position in the organization</b> Support technician at the viticulture department
	<b>Role in the project</b> She will provide Technical Support
<b>Profile</b> Imma Pausas is providing comercial and technical support to <b>Agropixel on precisions agriculture</b> for the Penedès regions. She holds a degree in Engineer in Agronomy with the specialization on Food Engineering. Furthermre, she holds an MSc on Viticulture, Enology and Marketing of the wine. She has experience working in project in the field of Integrated Management of plagues (IMP) and on Pruning Management in vineyards.	

Relevant Publications
<ol style="list-style-type: none"> <li>1. Tost, A. (2015) <b>Precision Farming in Vineyards</b>. <i>Tesis</i>. Escola Tècnica Superior d'Edificació de Barcelona</li> <li>2. Echániz L. (2010) <b>Vine yield production with NDVI multi-temporal data</b>. <i>Tesis</i>. Universidad Autónoma de Barcelona y CREAM.</li> <li>3. Pastor M. (2010). <b>Zonification of grape quality and selective verization base on vigour maps from at Raimat, Lleida</b>. <i>Tesis</i>. Universidad de Lleida. Dep. Mecanització.</li> <li>4. Martínez-Casasnovas J.A., Agelet J., Arnó J., Bordes X. &amp; Ramos M.C. (2010). <b>Protocolo para la zonificación intraparcelsaria de la viña para vendimia selectiva a partir de imágenes multispectrales</b>. <i>Revista De Teledetección</i> (Asociación Española de Teledetección) Número: 33 Páginas, inicial: 47 final: 52 Lugar de publicación: España ISSN: 1988-8740 Depósito legal: B-9.502-1993</li> <li>5. Arnó J., Bordes X., Ribes-Dasi M., Blanco R., Rosell J.R. &amp; Esteve J. (2005). <b>Obtaining grape yield maps and analysis of its within-field variability in Raimat (Spain)</b>. <i>Precision Agriculture '05</i>. eISBN: 978-90-8686-549-9   ISBN: 978-90-76998-69-5. DOI: <a href="http://dx.doi.org/10.3920/978-90-8686-549-9">http://dx.doi.org/10.3920/978-90-8686-549-9</a></li> </ol>
Relevant Products
<ol style="list-style-type: none"> <li>1. <b>Tool (2011-2013)</b>: Comercial development of a tool designed to efficiency manage irrigation in fields based in high-resolution remote sensing images for the thermic band.</li> <li>2. <b>GISWeb (2008)</b>: GISWeb (open source) for geographical information management of the vineyards of the Group Codorniu.</li> </ol>
Relevant Projects or Activities
<ol style="list-style-type: none"> <li>1. <b>New viticulture strategies for a sustainable management production of large areas</b>.  <b>Funded by:</b> Programa CIEN. CDTI  <b>Years:</b> 2014-2017  <b>Description:</b> Development of new strategies in the CODORNIU fields regarding large areas of production.</li> <li>2. <b>Commercial development tool for effectively irrigation programming site based in thermal high resolution images</b>  <b>Funded by:</b> CODORNIU  <b>Years:</b> May 2011-May 2014  <b>Description:</b> Development of technology to determinate water requirements to manage irrigation based in thermal high resolution images.</li> <li>3. <b>Influence of state water and management of vineyard on sensory appearance in variety 'Chardonnay' and 'Pinot Noir' for wine base 'Cava' Production'</b>  <b>Funded by:</b> CODORNIU  <b>Years:</b> February 2012- September 2015  <b>Description:</b> Study of factors that determine a grape of better quality in order to improve the quality and competitiveness of cava.</li> <li>4. <b>Water monitoring variables using technology based on satellite images and in situ sensors, and its correlation with productivity</b>  <b>Funded by:</b> CODORNIU  <b>Years:</b> January-October 2012  <b>Description:</b> Study of the correlation between soil moisture and other usual parameters (water potential, production and land cover), as first step of a valid technology to improve crop productivity.</li> </ol>

**5. Development of a predictive quality model red wine based on annual parameters in Rioja**

**Funded by:** CODORNIU

**Years:** January 2013 - May 2015

**Description:** Model for predicting grape quality for winemaking with two or three weeks before the harvest, considering as indicators partition parameters corresponding to the general carbohydrate model CropSyst, as well as other indicators obtained from the wine year that determine the quality of the grape (meteorology, water status of the plant, vigor, etc...).

**Relevant Patents**

Authors: Xavier Farré Fernandez – Urrutia Joan Esteve Julia

**Title:** Classification procedure and / or harvested from a vineyard or a field of fruit trees.

Abstract: Classification procedure with nest steps:

- Obtaining aerial images
- Allocating pixels
- Calculating a representative value of force of each of the pixels

Calculating stadistical values in each pixel and variability

**Significant infrastructure and/or major items of technical equipment**

Codorníu doesn't need any additional infrastructure than that of normal operation of the Vineyard

**Complementarities between partners**

The interest of current project is development itself in different areas of Southern Europe to analyze similar problems in several wineries and try to find common solutions.

#### 4.4 Institut de Recerca i Tecnologies Agroalimentaries (IRTA)

**Participant Identification Code (PIC):** 999506819

**Partner website** [www.irta.cat](http://www.irta.cat)

##### Partner Description

Public research institute dependant on the Conselleria d'Agricultura of the Catalan Government (Generalitat). Its mission is devoted to the research and applications for the several primary sectors related to the Agriculture in Catalonia

##### Role in the project

It will participate in the implementations of the DSS by adapting phenological models that which predict key seasonal times of the crop development. It will also evaluate the DSS in the part that affects the properly irrigation management of demonstration plots

#### Key Personnel Involved

##### Joan Girona (Male)



##### *Position in Organisation*

Senior Researcher

##### *Role in the project:*

Irrigation model calibration, field data monitoring on applied water and critical phenological events and DSS application supervision

##### *Profile*

Engineer in water relations in the continuum soil plant atmosphere and irrigation. Joan Girona has been researcher at IRTA for more than 30 years. His main interest are related with irrigation management under conditions of limited water availability, the seasonal sensitivity of woody crops to water stress, and how to apply these approaches in commercial orchards and vineyards.

##### Jordi Marsal (Male)



##### *Position in Organisation*


Senior Researcher


##### *Role in the project:*

Phenological and irrigation model calibration, field data monitoring on applied water and critical phenological events and DSS application supervision

##### *Profile*

Crop modeller in whole plant physiology and irrigation. Jordi Marsal is the head of the Use of Water Programme at IRTA. His background includes the evaluation of whole plant physiological responses to water deficit in fruit trees and grapevines. Over the last years his research has focused on quantifying such responses to produce a modelling framework that can be used from an irrigation management perspective. He has released several models to simulate crop phenology, tree water status, water requirements, yield and fruit quality. The adaptation of Cropsyst to grapevines is an output of his career.

Dr. Gerardo Lopez (Male)	
	<b>Position in Organisation</b> Senior Researcher
	<b>Role in the project:</b> Phenological and irrigation model calibration, field data monitoring on applied water and critical phonological events and DSS application supervision
<b>Profile</b> Research carrier oriented in crop physiology in fruit orchards and vineyards. Research carrier developed during 10 years in four important places for fruit tree and vineyards research: Institut de Recerca i Tecnologia Agroalimentàries (IRTA-Lleida, Spain), 5 years; University of California, Davis (USA), 2 year; University of Bologna (Italy), 1 year; and INRA-Montpellier (1 year and a half). My major contribution to this field has been to understand the effects of water stress, high air temperatures, and solar radiation on fruit crop production and the quality of fruit. I also studied source-sink relationships in fruit trees. I am developing and using crop models to integrate physiological knowledge at the whole-plant level, under different environmental conditions and over several years. My major goal is to understand the effects of multiple environmental conditions on plants and to provide information on how to manage crops under climate changing scenarios. Currently working at IRTA.	

Mercè Mata (Female)	
	<b>Position in Organisation</b> Technician
	<b>Role in the project:</b> Field data monitoring on applied water and critical phonological events and DSS application supervision
<b>Profile</b> Expert in irrigation field experiments. Merce Mata has been field technician at IRTA for more than 30 years. Her main activities are related with the determination of plant water status, yield, and fruit quality of fruit trees and grapevines grown under different irrigation management conditions including water stress.	
Relevant Publications	
<ol style="list-style-type: none"> <li>1. Marsal J., Johnson S., Casadesus J., Lopez G., Girona J., Stöckle C. (2014). <b>Fraction of canopy intercepted radiation relates differently with crop coefficient depending on the season and the fruit tree species.</b> <i>Agricultural Forest Meteorology</i> 184:1-11</li> <li>2. Samperio A., Moñino M.J., Marsal J., Prieto M.H., Stöckle C. (2014). <b>Use of CropSyst as a tool to predict water use and crop coefficient in Japanese plum trees.</b> <i>Agricultural Water Management</i> 146:57-68</li> <li>3. Bellvert J., Marsal J., Mata M., Girona J. (2016). <b>Yield, must composition, and wine quality responses to preveraison water deficits in sparkling base wines of chardonnay.</b> <i>American Journal Enology Viticulture</i> 67:1-12</li> <li>4. Bellvert,J., Marsal, J., Girona, J., Gonzalez-Dugo,V., Fereres, E., Ustin,S.L., Zarco-Tejada,P.J. (2016). <b>Airborne Thermal Imagery to Detect the Seasonal Evolution of Crop Water Status in Peach, Nectarine and Saturn Peach Orchards.</b> <i>Remote Sensing</i> 8(1)39</li> <li>5. Marsal, J., Casadesús, J., López, G., Mata, M., Bellvert, J., Girona, J. (2016). <b>Sustainability of regulated deficit irrigation in a mid-maturing peach cultivar.</b> <i>Irrigation Science</i> 34:201-208</li> </ol>	

Relevant Products
n.a.
Relevant Projects or Activities
<p><b>1. APPYMed (ARIMNET 219262)</b>  <b>Funded by:</b> FP7-ERANET  <b>Years:</b> 2013-2015  <b>Description:</b> Apple and Peach in Mediterranean orchards: Integrating tree water status and irrigation management for coping with water scarcity and aphid control.</p> <p><b>2. RTA 2012-00034-C02</b>  <b>Funded by:</b> INIA RTA 2012-00034-C02  <b>Years:</b> 2012-2015  <b>Description:</b> Production, quality and saving water in late plum and vineyard against postharvest deficit irrigation. Climate projections for different scenarios with delayed entry of winter rest.</p> <p><b>3. FUTUR AGRARI</b>  <b>Funded by:</b> FP7, LIFE12 ENV/ES/000647  <b>Years:</b> 2013-2017  <b>Description:</b> DSS for managing manure and fertilizers in vulnerable zones.</p> <p><b>4. EFFIDRIP</b>  <b>Funded by:</b> FP7, SME 286807  <b>Years:</b> 2012-2014  <b>Description:</b> Proved ideas on automated ICT-based irrigation management</p> <p><b>5. IES</b>  <b>Funded by:</b> FP7, LIFE11 ENV/ES/621  <b>Years:</b> 2012-2015  <b>Description:</b> Reference agronomical data and background for simulation of a wide scope of scenarios</p>
Relevant Patents
n.a.

Significant infrastructure and/or major items of technical equipment
Neutron probe (for measuring soil water content)
<p>Equipment necessary for automated control of irrigation.</p> <p>The Use Efficient of Water team has all the required equipment to successfully design and perform experiments related with irrigation in grapevines, including multiple devices for determining the physiological performance of plants (gas analysers, porometers, light interception), their water status (pressure chambers) and the soil water content (Neutron probe). The team has the necessary abs for the determination of fruit quality and development of electronic devices for irrigation control. The team has the necessary abs for the determination of fruit quality and development of electronic devices for irrig</p>

Complementarities between partners
<p>IRTA research group works on irrigation management and has develop several models that can be applied in the present project including models for predicting phenology, yield, fruit quality and water requirements according with climatic conditions. All these knowledge will be applied in the current VISCA project and it will be shared among all the partners. IRTA has already worked in vine management projects with another partner of the project (NAP), having these two teams a good complementary,</p>

communication and strong potential to collaborate and produce an advance of knowledge on vineyards management. At a local level, IRTA has a long expertise collaborating with one of the wineries involved in the project (CODORNIU). Codorniu and IRTA have been collaborated for 14 years in research to determine the influence of irrigation management in the productivity of their vineyard and the quality of wine. Given the progress made and the possibilities for improvement in this field, in 2004 it was created the Mixed Research Unit (Join Research Unit, JRU) Codorniu-IRTA. The collaboration produced significant technological advances and a more efficient use of irrigation water of vines. In these years of activity, the JRU has developed experimental activities to respond to eleven strategic objectives of great interest for Codorniu. Many of the results of the activity in the JRU have been published in scientific journals of the highest standard in the field of irrigation and vines such as Irrigation Science, American Journal of Enology and Viticulture, Australian Journal of Grape Research and Wine. The activity over the last years allowed to collect a tremendous amount of physiological information that has been included in some models developed by IRTA such as Cropsyst that are currently used to facilitate estimations of plant water requirements to Codorniu technicians. The activity is currently active with several projects to determine the vine water requirements in multiple vineyards with different cultivars and growing conditions.

Participant Identification Code (PIC): 999599357

Partner website [www.ismb.it](http://www.ismb.it)

#### Partner Description

Istituto Superiore Mario Boella (ISMB) is a research & innovation center operating in the Information and Communication Technologies (ICT) domain. Founded in 2000 by Compagnia di San Paolo and Politecnico di Torino, today ISMB relies on the technological and process competences of around 150 researchers working in close cooperation with companies, academia and Public Administration.

ISMB operates according to the knowledge management model: this means that it plays an active role not only in devising innovative solutions, but also in their implementation and consequent developments. This approach represents a step forward with respect to technology transfer, and in this sense, the evolutionary lines of European research are taken into account. Consistently with process innovation goals, the Institute has developed a strong competence in new business models that are a necessary component for the economic sustainability of innovative solutions. Moreover, the Institute is involved in several industrial cooperation activities with both large enterprises and SMEs, as well as in various higher-education initiatives in partnership with academic institutions.

ISMB is organized in Research Areas focused on core sectors of ICT. Cloud computing and applications for embedded and mobile devices (Mobile Solutions), satellite navigation systems (Navigation Technologies), wireless sensor networks and pervasive systems (Pervasive Technologies), broadband communications and electromagnetic simulation (Multi-Layer Wireless Solutions), optical fibres (Photonics), computing infrastructures based on technologies of virtual grid and cloud computing solutions (Advanced Computing & Electromagnetics) and new paradigms for Information Management and Innovation Development. The Mobile Solutions Research Area has been involved::

- The **Mobile Solutions** Research Area of ISMB works in the ecosystem of Mobile Solutions and the emerging paradigms of **BigData**, with the aim to support the innovation of products and processes realizing end-to-end solutions. The area has a unit dedicated to mobile technologies and usability (in this framework we are in the national board of the Italian Society of Ergonomics <http://www.societadiergonomia.it/>) and hosts the **Microsoft Innovation Center**. It is a joint innovation group between Microsoft and ISMB, focused on the research and development on smart embedded devices and **mobile applications** connected to back-end systems based on **cloud computing** technology to provide added-value services following the **IoT paradigm**. The team combines the research attitude with the practical experience in software and products development collaborating with industry and public sector partners. Thanks to the skills of its developers, including a wide experience in GNSS Location Based Services, it fosters the innovation of products and processes through the adoption of innovative technologies.

It is important to underline the role that ISMB plays at European level in the IoT, acting as IoT competence center for Microsoft and in the emergent data management, also supported by the BDVA membership (<http://www.bigdatavalue.eu/>). Moreover, consistently with the ISMB mandate, the research areas work on innovative projects and solutions, leveraging on the cooperation with institutional partners such as ERTICO (<http://www.ertico.com/>) or the partnership with industrial players (i.e. ST Microelectronics, Microsoft), which allows for **early access to new technologies** and a strong commitment for the innovation exploitation.

More information are available at the company website [www.ismb.it](http://www.ismb.it).

#### Role in the project

ISMB will be responsible of the development of several system components, namely the centralized that



will collect and aggregate all the data sources involved, and the visualization platforms, which will encompass also a mobile application. ISMB will support all tasks related to data analysis and predictions aimed at decision support, starting from the models and the data provided by the partners. ISMB will also support in the communication and dissemination activities.

## Key Person Involved

### Fabrizio Dominici (Male)



#### **Position in Organisation**

Head of Mobile Solutions research Area

#### **Role in the project**

Leader of WP3 "Climate Service DSS Development"

#### **Profile**

Fabrizio Dominici is the head of Mobile Solutions research area at ISMB and the Microsoft Innovation Center Torino Director managing a group of 20 researchers. He obtained the Master Degree in Telecommunications Engineering in July 2005 at Politecnico di Torino (Italy). In August 2005, started working in the navigation and signal processing lab of ISMB and in 2010 he was appointed head of the MIC. He has several experience in the fields of natural user interfaces, hardware and software development for embedded systems and sensors, mobile technologies and enterprise software architectures based on cloud computing. He acts as project manager focusing on large enterprises partnerships (i.e. Microsoft and Econocom groups) and European and National innovation projects (currently he is the coordinator of FLOODIS - FP7-SPACE project GA n. 607220 and coordinator of the ASSIST ESA tender). He is also author of several publications on journals, conferences and book chapters.

### Antonella Frisiello (Female)



#### **Position in Organisation**

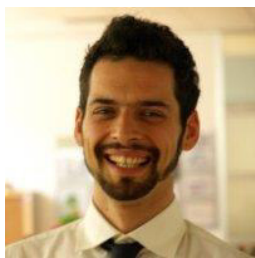
Senior Research on User Experience


#### **Role in the project**

Responsible of the user experience design, and of tasks 3.3 "Data visualization for DSS" and of the mobile user experience of task 3.4 "Mobile Application Development"

#### **Profile**

Antonella Frisiello is a Senior Researcher at Istituto Superiore Mario Boella, she works as User Experience Specialist, dealing with service design, cognitive and macro-ergonomics, usability. She has been involved in European and national research projects, focused on the Mobility and Smart-Health domains. In particular, the current activities concern socially assistive robotics, telemedicine and cross-context services. Through several in-field researches involving real users, she has gained specific expertise on services and technologies supporting the independent living and active aging. As member of the Human Factors Technical Committee of ETSI- European Telecommunication Standard Institute, she worked on technical standards definition on the Personalization of ICT products and services, and e-Health systems as well.

<b>Claudio Rossi (Male)</b>	
	<p><b>Position in Organisation</b></p> <p>Senior Researcher in ICT Systems and Data Analysis</p>
	<p><b>Role in the project</b></p> <p>Responsible of task 3.1 “Technical and Architectural Design” and of the system implementation overall, including task 3.3” Data Integration and Processing”.</p>
<p><b>Profile</b></p> <p>Claudio Rossi graduated with a double bachelor degree in Information and Communication Technology at the INPG - Institut National Polytechnique de Grenoble (France) and at the Politecnico di Torino. In 2005 he obtained a Master of Science in Electrical and Computer Engineering from the University of Illinois at Chicago (UIC) and in 2006 he graduated from Politecnico di Torino with summa cum laude degree in Electronics. Between September 2006 and October 2007, he worked at Consorzio per il Sistema Informativo (CSI) as software analyst. From October 2007 to June 2010 he worked as a Project Manager at Fiat Group Automobiles (FGA). He was with the International Manufacturing Engineering team and with the World Class Manufacturing Headquarter. He led the realization of a new passenger car plant in India and the development of new standards. From June 2010 to July 2014 he worked for the Telecommunication Group (DET) of Politecnico di Torino as project manager, software analyst, programmer and system admin, mainly focusing on the realization of a novel self-hosted peer-to-peer social network, and on interference estimation and classification using innovative algorithms and Software Defined Radios. From September 2012 to March 2013 he was an intern at Telefonica I+D working on bandwidth aggregation techniques between wired and cellular networks. In Dic 2013 he obtained from Politecnico di Torino his PhD with the thesis titled "Cooperation Strategies for Enhanced Connectivity at Home", proposing several techniques to overcome connectivity issues, boost connection speed, achieve energy efficiency in wireless residential networks. He is now a researcher and project manager in the Microsoft Innovation Center at ISMB, focusing on mobile sensing, cloud-based web applications, wireless networks, and data analysis.</p>	

<b>Quynh Nhu Nguyen (Female)</b>	
	<p><b>Position in Organisation</b></p> <p>Researcher in Service Design and Usability</p>
	<p><b>Role in the project</b></p> <p>Responsible of task 3.4 “Mobile Application Development”.</p>
<p><b>Profile</b></p> <p>Quynh Nhu Nguyen received the bachelor's degree in Industrial Design at the Politecnico di Torino in 2010 and the master's degree in Product Service System Design at the Politecnico di Milano in 2013. Since December 2014 she has been working at the ISMB as researcher within the Mobile and Usability Unit with particular attention to social aspects, in terms of connections between people, physical places, objects and terminals. Her main skills deal with: service design tools, participatory design and user analysis, info visualization, interaction design and rapid prototyping.</p>	
<b>Relevant Publications</b>	
<ol style="list-style-type: none"> <li>1. Rossi, C., Favenza A., Scullino F., Macchia V., Spoto G., and Dominici F. (2015). <b>Evaluating FLOODIS: Mobile Sensing for a Flood Emergency Service in the Cloud</b>. Presented at <i>IEEE CLOUDTECH</i>, Marrakesh, Morocco, June 2015</li> <li>2. Rossi, C., Stemmerger, W., Bielski, C., Zeug, G., Costa, N., Poletto, D., Spaltro, E., Dominici, F. (2015). <b>Coupling Crowdsourcing, Earth Observations, and EGNSS in a novel Flood Emergency Service in the</b></li> </ol>	

<p><b>Cloud.</b> <i>IGARSS Conference</i>, 26-31 July 2015, Milano.</p> <p>3. Favenza, A., Pasin M., Marucco G., Huang J., and Scullino F. (2014). <b>Challenges and Opportunities of EGNOS/EDAS Augmentation and Integrity Computation in the Cloud.</b> Presented at the <i>27th International Technical Meeting of The Satellite Division of the Institute of Navigation (ION GNSS+)</i>, Tampa, Florida, September 2014.</p> <p>4. Favenza, A., Rossi C., Pasin M., and Dominici F. (2014). <b>A Cloud-based Approach to GNSS Augmentation for Navigation Services.</b> Presented at <i>7th IEEE/ACM International Conference on Utility and Cloud Computing (UCC)</i>, London, United Kingdom, December 2014.</p> <p>5. Frisiello, A., Lotito A., Spoto G., Macchia V., Bolognesi T., and Ruà F. (2013). <b>A New Urban Technoscape Component: The Smart2Poster.</b> <i>ACM UbiComp Conference</i>, Zurich, Switzerland, 09/2013.</p>
<p><b>Relevant Products</b></p>
<p>1. <b>FLOODIS Mobile Application (2015):</b> Cross platform mobile application providing a set tool to both the citizens and first responders, in order to report ongoing flood situations through image capture. The images are transmitted to a centralized cloud platform which is able to integrate this data in the forecast and nowcast model in order to enhance first responders' operations and provide early warning information back to citizens. The application is available in free download on the main Apps Market (App Store, Windows Store and Google Play)</p>
<p><b>Relevant Projects or Activities</b></p>
<p>1. <b>FLOODIS - Integrating Gmes Emergency Services With Satellite Navigation And Communication For Establishing A Flood Information System (Project coordinator)</b>  <b>Funded by:</b> European Commission-FP7  <b>Years:</b> 2013-2015  <b>Description:</b> The main goal of this project is to develop the complete infrastructure that will alert professional users of an impending disaster and subsequently provide them with regular updates and geographical information (maps layers via mobile mapping application) concerning the disaster. Under this project, the disaster alert and information are focused on flood events, but the platform can readily be adapted to other types of disasters.  Project's overall objective is to increase preparedness and response capacities of decision-makers, emergency planners and first responders in respect to amplifying hazards in large disasters. SnowBall innovates in its modular approach to crises, its modelling techniques, its generic Events Log Database and tools to follow public behaviour (Emergency Alert, social networks, mobile application). A cloud-based computing infrastructure of the decision support system will be developed in order to respond efficiently to the needs of the DSS in terms of processing time and computing resources. Study and analysis of state of the art of Cloud Computing platforms (private, public and hybrid models) with a special focus on Private Cloud solutions will be made.</p> <p>2. <b>SnowBall - Lower the impact of aggravating factors in crisis situations thanks to adaptive foresight and decision-support tools (Project partner)</b>  <b>Funded by:</b> European Commission-FP7  <b>Years:</b> 2014-2017  <b>Description:</b> Project's overall objective is to increase preparedness and response capacities of decision-makers, emergency planners and first responders in respect to amplifying hazards in large disasters. SnowBall innovates in its modular approach to crises, its modelling techniques, its generic Events Log Database and tools to follow public behaviour (Emergency Alert, social networks, mobile application). A cloud-based computing infrastructure of the decision support system will be developed in order to respond efficiently to the needs of the DSS in terms of processing time and computing resources. Study and analysis of state of the art of Cloud Computing platforms (private, public and hybrid models) with a special focus on Private Cloud solutions will be made.</p>

**3. TRITON - TRusted vessel Information from Trusted On-board iNstrumentation (Project Coordinator)**

**Funded by:** European Commission-FP7

**Years:** 2013-2015

**Description:** TRITON (TRusted vessel Information from Trusted On-board iNstrumentation) is a collaborative European Community project - funded under the Seventh Framework Programme (FP7-SEC-2012-1) - that aims at giving some of the possible answers to this threat, focusing on increasing the trustworthiness of the vessel on-board instrumentation used to report vessel information to the control organisms. This goal is pursued by enhancing the internal robustness of two core sub-systems of the on-board control instrumentation, namely the GNSS receiver and the ship-to-ship and ship-to-shore communication segment. The TRITON project aims at improving the intrinsic robustness of the on-board equipment of ship reporting systems (e.g. Automatic Identification System - AIS, Vessel Monitoring System - VMS, Long Range identification and tracking - LRIT), contributing to increase the overall trustworthiness of these cooperative systems and, in turn, the security of the maritime domain as a whole.

**4. ASSIST - Advanced Snow plough and Salt spreader based on Innovative Space Technologies**

**Funded by:** ESA

**Years:** 2015-2017

**Description:** The project will provide a complete system (the ASSIST system) able to exploit EO, GNSS and weather forecast data to support winter maintenance teams in the pre-operational and in the operational phases of main winter maintenance tasks (i.e. salt/ sand spreading and snow removal). ISMB is the coordinator of this project.

**Relevanty Patents**

*n.a.*

**Significant infrastructure and/or major items of technical equipment**

The Mobile Solutions research area counts 17 researches and it includes the Microsoft Innovation Center (MIC), which can leverage on premium Microsoft tools and services in order to support the creation of innovative services and products. Specifically, the MIC can freely use the Microsoft Azure Cloud Computing platform, which will be used to deploy, test, and validate the VISCA centralized ICT solution and services. The MIC also manages trainings, hackathons, and the Microsoft' start-up program BizSpark.

**Complementarities between partners**

ISMB is complementary to the other partners because it has strong competences in delivery high-fidelity prototypes and pre-commercial products. The Mobile Solution area is focused on Cloud technologies, data analysis, and mobile applications featuring state-of-art user experience and advanced visualization technique, especially with respect to geolocalized and EO data. ISMB has a long track history of cooperation with SMEs, and it has supported them in the realization of ICT solutions for new commercial products and services. ISM complements the agricultural and meteorological competences of the other partners with a strong ICT background and skills, which are required to develop the proposed innovations.

#### 4.6 Università degli Studi di Napoli Federico II – Department of Agricultural Sciences (NAP)



**Participant Identification Code (PIC):** 999976590

**Partner website** <http://www.dipartimentodiagraria.unina.it/>

##### **Partner Description**

The UNINA-DAS is settled at the historical Faculty of Agriculture located in the royal palace of Portici that is a long established Institution with expertise in the fields of plant science, fire ecology, animal ecology and behaviour, conservation biology and ecological modeling.

The institutional education activities range from undergraduate courses to doctoral studies in the field of agriculture, food science, forestry and environmental science.

The scientific relevance and international recognition of these research products positioned, for the year 2014, the University of Naples Federico II as number one in Agricultural Sciences in Italy among the top 16 Universities evaluated, 12 out of 129 in Europe, and 38 out of 300 in the world (see National Taiwan World University Ranking).

##### **Role in the project**

The aim of this research unit will be to provide support to build a decision support system (DSS) to help viticulturists in selecting the correct intensity of post-veraison summer pruning to be applied in order to control sugar accumulation in the berries and, at the same time, to allow the fruits to reach a proper phenolic maturity. With this aim this research unit will use the model to predict, for 'Aglianico' grapevines the phenology and sugar accumulation in the berry at harvest.

##### **Key Personnel Involved**

##### **Boris BASILE (Male)**



##### **Position in Organisation**

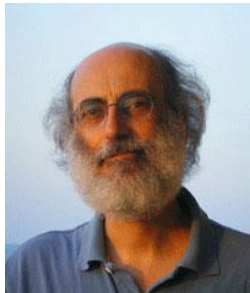
Associate Professor


##### **Role in the project**


Calibration of phenological and irrigation models for the case of Aglianico, monitoring of phenological events and supervision of management decisions at field level.

##### **Profile**

He is a whole-tree environmental physiologist specialized in Viticulture. His field of expertise includes water and light relations and carbon partitioning of fruit trees in general. The main objective of his research is to develop innovative vineyard management practices aiming to optimize, in a changing climate, fruit yield and berry composition at harvest. He has ongoing collaborations with different scientific groups of modelers to build models aiming to predict plant phenology and growth.

Stefano MAZZOLENI (Male)	
	<b>Position in Organisation</b> Full Professor
	<b>Role in the project</b> Calibration of phenological and irrigation models for the case of Aglianico, monitoring of phenological events and supervision of management decisions at field level.
<b>Profile</b> PhD at University of Aberdeen (UK) - MSc at Michigan State University (USA). Full professor of Applied Ecology. He has a wide experience in project management and coordination of several EU funded projects and National and Regional research programmes. Main research work on vegetation dynamics, fire ecology, litter decomposition and soil organic matter dynamics, plant-soil interactions and effects of disturbance, Software tools for ecological modelling.	

Chiara CIRILLO (Female)	
	<b>Position in Organisation</b> Assistant Professor
	<b>Role in the project</b> Calibration of phenological and irrigation models for the case of Aglianico, monitoring of phenological events and supervision of management decisions at field level.
<b>Profile</b> Her research activity aimed to study physiological aspects of on-tree and post-harvest fruit maturation of fruit trees. She mainly worked on fruit tree environmental-physiology, with particular interest in physiological issues related to tree light interception, photosynthesis, carbon partitioning, tree growth and development, and fruit ripening. She also studied topics related to the improvement of fruit quality and yield (trellises, rootstocks, cultivars, harvest techniques, nettings, etc.), the reduction of cultivation costs (trellises, mechanization, etc), the introduction of new cultivation techniques with a low environmental impact (integrated orchard management, organic cultivation), improvement of post-harvest performances of fruit (longer shelf-life, etc.), and the preservation of biodiversity of fruit trees	

Francesco GIANNINO (Male)	
	<b>Position in Organisation</b> Assistant Professor
	<b>Role in the project</b> Calibration of phenological and irrigation models for the case of Aglianico, monitoring of phenological events and supervision of management decisions at field level.
<b>Profile</b> Ph.D at University of Naples. Researcher at University of Naples. Expert in modelling and integrated software. The research interest is mainly devoted to the design, development and analysis of mathematical models in Ecology. Methodological and computational aspects have been considered for several different	



applications.

The research has been carried out in the frame of several international projects and collaborations with European research groups which are leaders in the area of ecological modelling.

#### Fabrizio Carteni (Male)



##### **Position in Organisation**

*Post Doc*

##### **Role in the project**

Calibration of phenological and irrigation models for the case of Aglianico, monitoring of phenological events and supervision of management decisions at field level.

##### **Profile**

Ph.D at University of Naples. His main research activity is focused on plant eco-physiological and developmental processes studied with different modeling approaches.

Other subject of interest is the emergence of vegetation spatial patterns studied through reaction-diffusion models.

##### **Relevant Publications**

1. Basile B., Caccavello G., Giaccone M., Forlani M. (2015). **Effects of early shading and defoliation on bunch compactness, yield components, and berry composition of Aglianico grapevines under warm climate conditions.** *American Journal of Enology and Viticulture*, 66(2):234-243
2. Basile B., Girona J., Behboudian M.H., Mata M., Rosello J., Ferré M., Marsal J. (2012). **Responses of "Chardonnay" to deficit irrigation applied at different phenological stages: vine growth, must composition, and wine quality.** *Irrigation Science*, 30(50):397-406
3. Basile B., Giaccone M., Cirillo C., Ritieni A., Graziani G., Shahak Y., Forlani M. (2012). **Photo-selective hail nets affect fruit size and quality in Hayward kiwifruit.** *Scientia Horticulturae*, 141:91-97
4. Carteni, F., Giannino, F., Schweingruber, F.H., Mazzoleni, S. (2014). Modelling the development and arrangement of the primary vascular structure in plants. *Annals of Botany*, 114 (4), pp. 619-627
5. Vincenot, C.E., Giannino, F., Rietkerk, M., Moriya, K., Mazzoleni, S. (2011). **Theoretical considerations on the combined use of System Dynamics and individual-based modeling in ecology.** *Ecological Modelling*, 222 (1), pp. 210-218

##### **Relevant Products**

1. **Primary vascular structure in plants model (2014):** A spatially explicit reaction-diffusion model defining a set of logical and functional rules able to simulate the differentiation of procambium, phloem and xylem and the emerging radial patterns of vascular tissues. The model was design in SIMILE and implemented in Matlab.
2. **Phenology model (2015):** A model to simulate phenology in different tree species. The model was design in SIMILE and implemented in Matlab.
3. **Fire propagation model (2013):** A new Decision Support System (DSS), named TIGER MEG, was developed in collaboration with the national forest service Corpo Forestale dello Stato (CFS). The system is able to simulate the wildfire contour line according the following inputs: vegetation type, slope, wind, vegetation moisture. The system offers also a new way to estimate the area of origin of forest fires, in support of the existing methods of analysis used by the investigators. The system is aimed to be an advanced tool for teaching applications to show the interactions between wind and fire in different landscape scenarios. The model was design in MATLAB and implemented in C++
4. **Organic Matter DYnamic model (OMDY) (2013):** A model to simulate the organic matter decomposition according different quality and environmental input data. The model was design in SIMILE and implemented in Matlab



<p><b>5. Vegetation dynamic (2012, 2013, 2014):</b> A model able to describe the dynamics of the plant biomass in the presence of toxicity produced by the decomposition of accumulated litter in the soil. The model reproduces the emergence of patterns of a single clonal plant species. The model was design in SIMILE and implemented in Matlab</p>
<p><b>Relevant Projects or Activities</b></p>
<p><b>1. LIFE SOILCONSWEB: Multifunctional Soil Conservation and Land Managment through the Development of a Web Based Spatial Decision Supporting System (Modelling coordinator)</b>  <b>Funded by:</b> EU LIFE08 ENV/IT/000408  <b>Years:</b> 2010-2014  <b>Description:</b> The aim of the SOILCONSWEB project was both to produce, to test and to apply an IT tool to support stakeholders decision on landscape issues aiming to both the best soil conservation and land management and to an easy landscape implementation o f some important environmental related EU directives and regulations and NAP.  In the project, this research group provide a dynamic model to describe the Peronospora cycle</p>
<p><b>2. Fire PARADOX "An Innovative Approach of Integrated Wildland Fire Management (Modelling coordinator)</b>  <b>Funded by:</b> EU Integrated Project FP6 -018505  <b>Years:</b> 2006-2010  <b>Description:</b> FIRE PARADOX sets the basis for a fire management policy in the European Union. The central objective of Fire Paradox is to prevent the current disastrous social, economic and environmental consequences of wildfires in the Mediterranean environments. The approach is innovative: the regulation of the wildfire problem is based on the wise use of fire. In the project, this research group provide a fire 2D simulator to evaluate the fire propagation dynamic.</p>
<p><b>3. PRIN - Traditional agricultural landscapes in Italy: multi-disciplinary and multi-scale assessment for the development of an integrated model for landscape planning and management (Modelling coordinator)</b>  <b>Funded by:</b> Ministero Dell'istruzione, Dell'università E Della Ricerca Scientifica – Programmi Di Ricerca - Anno 2010-2011  <b>Years:</b> 2013-2016  <b>Description:</b> The focus of project was on the development and application of a methodology for the characterization of eco-hydrological processes in the traditional agricultural landscapes.  In the project, this research group design and implement a system dynamic model of phenology.</p>
<p><b>4. FISR - MESCOSAGR: "Sustainable methods for organic carbon sequestration in agricultural soils. Evaluation of the effects on the chemical, physical, biological, and agronomical quality of soils. (Modelling coordinator)</b>  <b>Funded by:</b> Ministero Dell'istruzione, Dell'università E Della Ricerca Scientifica –Fondo Integrativo Speciale Per La Ricerca  <b>Years:</b> 2006-2010  <b>Description:</b> In the project, this research group design and implement a new model, named SOMDY, that is based on an advanced description of SOM chemical quality by 13C-CPMAS NMR instead of traditional C/N ratio. The model includes also the effects of physical aggregation of organic matter.</p>
<p><b>5. EU - ModMED Modelling Mediterranean Ecosystem Dynamics ENV4 CT-97 0680 (Project Coordinator and Modelling coordinator)</b>  <b>Funded by:</b> EU ENV4 CT-97 0680  <b>Years:</b> 1997-2000  <b>Description:</b> The objective of the Modmed project has been the improvement of the understanding of Mediterranean ecosystems dynamics and degradation.</p>

Relevanty Patents
<i>n.a.</i>

Significant infrastructure and/or major items of technical equipment.
<p>We support other research groups without modelling expertise in the implementation of models in their specific field of interest..</p> <p>Software expertise: modelling tool and language (Matlab, Simile, Stella, ...), statistic package (SPSS, Statistica, ...), GIS systems (ArcGIS, QGIS, ...)</p>

Complementarities between partners
<p>NAP research group works on system dynamic modelling with application in the following different fields relevant to this project: • Vegetation modeling; • Fire modeling; • Software tools and applicative aspects; • Decision Support Systems. All these knowledge will be applied and shared among VISCA's partners. NAP has already worked in vine management projects with IRTA, and they are used to have a good communication among the two research groups. NAP will coordinate the demosite of Italy that will be on the MAS premises. NAP and MAS have experience on working together for several years now.</p>

#### 4.7 Azienda Vinicola Michele Mastroberardino Spa – Mastroberardino spa



Participant Identification Code (PIC): 920262669

Partner website [www.mastroberardino.com](http://www.mastroberardino.com)

##### Partner Description

**Mastroberardino** company is fully committed to traditional cultivation of ancient grape varieties, with ability to blend modern technology with time-tested techniques. The Mastroberardino long term goal has been focusing on wines reflecting the typical characters and notes of the Irpinia territory (located in the province of Avellino – Campania region – Italy). The family owns an extensive network of vineyards in the DOCG's area like Montemarano, Mirabella, Lapio, Pietradefusi, in "Taurasi DOCG" appellation; Montefusco, Santa Paolina, Tufo, Petruro in "Greco di Tufo DOCG" appellation; Santo Stefano del Sole, Lapio, Montefalcione, Manocalzati in "Fiano di Avellino DOCG" appellation; the Apice estate in "Sannio DOC", and the vineyards located in the archeological site of Pompeii. Mastroberardino has been working to identify different zones with distinctive type of soil in the Irpinia areas, in order to select the most quality sites to get the best grapes for making wines with personality.

The Mastroberardino vineyards are located in different altitudes, starting from 450 meters above the sea level up to 700 meters. The benefit is the high difference in temperature between daytime and night, a unique microclimate in the worldwide viticulture scenario.

The company collects climate data on daily basis in all vineyards using weather stations in order to understand the vines healthy conditions and possible plant water stress.

A micro-vinification center located in the old winery of Atripalda (Avellino) is the key to analyze the specific character and peculiar notes of the grapes coming from the different vines in the family estates.

##### Role in the project

The role is to support the research in several vineyards planted with aglianico grape in different terroirs with the aim to achieve the calibration of phenological and management models for the case of Aglianico. The result could be the technical supporting tool for phenological events and management decisions at field level. Mastroberardino will provide feed-back as End-User. It will participate in WP1, and will be actively involved in the design and developments of WP3 ( Task 3.1 End-user requirements, Task 3.4 and Task 3.5 DSS development and visualization). Mastroberardino team will also participate in WP4. Demonstration, having a pilot site on their premises and working coordinated with University of Napoli Team. Additionally, they will participate in WP5 on Exploitation and Dissemination tasks.

##### Key Personnel Involved

##### Dr Antonio Dente (male)



##### Position in Organisation

Chief agronomist

##### Role in the project

The Chief agronomist supervises, organizes and plans the work and the program in the vineyards, taking samples and studying the results.

**Profile**

Agronomist, looks after the management of the company vineyards (workers coordination, fertilization and treatments decisions, new plantation decisions, research and development).

Degree in Agriculture, defines the annual management plan of interventions and treatments in the vineyards . He oversees grape production activities, the organization of work and assigns tasks, organize and control the daily activities of the field, conducts monitoring of the analytical control of production parameters.

He collaborates with the laboratory manager in the choice of the monitoring of the production phases plans. He organizes and coordinates the planning of the harvest stages.

**Prof. Piero Mastroberardino (male)****Position in Organisation**

Owner – CEO of the Board

**Role in the project**

The CEO supervises, coordinates and obtains constant information about the project from the technical team.

**Profile**

He is the legal representative of the company. He has extraordinary and ordinary administration powers. He is in charge of human resources management.

The Management activity consists in carrying out the guidelines and directives expressed by the administrative executive committee.

Full Professor of Management, Department of Economics, University of Foggia.

**Dott.sa Daniela Strollo (female)****Position in Organisation**

Chief Quality Management

**Role in the project**


The Chemist, laboratory director, coordinates with the agronomist and oenologist for the choice of methods of analysis, according to the fields of investigation chosen by the scientist in charge.

**Profile**

Chemistry graduated, collaborates with the CEO to the definition of annual plans for quality improving and related objectives;

She carries out activities to ensure the application and maintenance of the requirements of UNI EN ISO 9001: 2008, elaborates quality programs in order to achieve the objectives, monitor the implementation of approved programs and take the necessary corrective measures to prevent the occurrence of non-compliance of the product, process or system.

She organizes and directs the laboratory activities.

Dott. Massimo Di Renzo (male)	
	<b>Position in Organisation</b> Chief oenologist
	<b>Role in the project</b> The Chief winemaker coordinates production of wine obtained from the study of winemaking potential crop of experimental vineyards.
<b>Profile</b> Oenologist, looks after the work in the cellar and the production of the wines. He oversees the production of wine, the organization of work and assigning tasks, organizes and controls the daily activities of the cellar; conducts monitoring of the analytical control of production parameters; collaborates with the laboratory manager in the choice of the monitoring of the production phases plans; manages and organizes the production planning activities. He cares research and development related to wine production.	
<b>Relevant Publications</b>	
<ol style="list-style-type: none"> <li>1. Tedesco I., Moccia S., Volpe S., Alfieri G., Strollo D., Bilotto S., Spagnuolo C., Di Renzo M., Aquino R.P. &amp; Russo G.L. (2016). <b>Red wine activates plasma membrane redox system in human erythrocytes.</b> <i>Free Radical Research</i> ISSN: 1071-5762 (Print) 1029-2470 (Online) Journal homepage: <a href="http://www.tandfonline.com/loi/lfra20">http://www.tandfonline.com/loi/lfra20</a></li> <li>2. Scognamiglio P., Giaccone M., De Micco V., Dente A., Forlani M. &amp; Basile B. (2016). <b>Influence of pre-anthesis defoliation on yield components and berry composition of Greco grapevines.</b> <i>Tenth International Symposium on Grapevine Physiology and Biotechnology</i></li> <li>3. Mastroberardino P., Nigro C., Calabrese G., Cortese F. &amp; Carolillo G. (2009). <b>Family business: institutional framework and entrepreneurial power.</b> <i>Int. J. Globalization and Small Business</i>, Vol. 3, No. 4, 2009</li> </ol>	
<b>Relevant Products</b>	
n.a.	
<b>Relevant projects or activities</b>	
<ol style="list-style-type: none"> <li>1. <b>PROJECT CAMPUS QUARC</b>  <b>Funded by:</b> Campania Region POR 2007-2013  <b>Years:</b> 2012-2014  <b>Description:</b> The project Campus QUARC aims to improve the efficiency of the production processes to increase the competitive markets of five agri-food sectors of excellence in the Campania Region: Wine, Pasta, Olive Oil, Dairy Products and Chestnut. The tool is to create highly innovative systems, improving the quality (also extended to food safety) throughout recognition, genetic, origin and environmental. </li> <li>2. <b>PROGETTO DIVINO</b>  “Soluzioni distributive innovative per la comunicazione della distintività del vino italiano sul mercato consumer internazionale”  <b>Funded by:</b> Ministero dello sviluppo economico  <b>Years:</b> 2010-2014  <b>Description:</b> The project aims to develop an innovative distribution format, dedicated to Italian wine, to be proposed on the international market "consumer". The value add in the competitive processes is in the ability to communicate a cultural identity and the sense of territory as a distinctive factor. </li> </ol>	

### 3. VIVA Sustainable wine

**Funded by:** Ministero dell'Ambiente

**Years:** 2012-2014

**Description:** The project represent the first specific study on environmental impact of wine production, using, together with the classical WFP and CFP ratio, the Territory and Vineyard ratio which extends the commitment to the whole area involved in grapes and wines production. The project aims to define the guidelines for a sustainable production, develop a code which provides a certification for companies that will adopt these guidelines, and train experts able to develop protocols for implementing sustainability in the whole industry and to raise consumers' awareness at National and International levels.

#### Relevant projects or activities

n.a.

#### Significant infrastructure and/or major items of technical equipment

Mastroberardino premises and machines usually used during the vineyard management.

#### Complementarities between partners

The company collects climate data on daily basis in all vineyards using weather stations in order to understand the vines healthy conditions and possible plant water stress. A micro-vinification center located in the old winery of Atripalda (Avellino) is the key to analyze the specific character and peculiar notes of the grapes coming from the different vines in the family estates. They have experience in working in close collaboration with research centers (NAP) and are used to participating in research projects. They will provide their experience as end-users and cooperate with the rest of end-users sharing information on the developments and advances of the project. They are currently participating in projects with IRTA and Codorniu.

#### 4.8 Symington – Vinhos S. A. / SYM

**Participant Identification Code (PIC):** 920164505

**Partner website:** [www.symington.com](http://www.symington.com)

##### **Partner Description**

The Symingtons, of Scottish, English and Portuguese descent, have been Port producers for five generations since 1882, although their family's involvement in Port dates back fourteen generations to 1652 through their great-grandmother Beatrice de Carvalhosa Atkinson, whose ancestors were among Port's pioneers. Symington Family Estates is the only principal Port Company owned by one family.

Five of the family (Paul, Johnny, Rupert, Dominic and Charles) work together, maintaining the vineyards and making the wines for four historic Port houses: Graham's, Cockburn's, Dow's and Warre's. The Symingtons also own Quinta do Vesuvio, one of Portugal's greatest wine estates. The family accounts for 34% of all Premium Port, making it one of the leading quality Port producers.

The Symingtons are the leading vineyard owners of the Douro Valley (Unesco World Heritage classification) in Northern Portugal with 27 vineyard properties, known as *quintas*, amounting to 1 002 hectares of vines of which 126 ha are organically farmed. This is the largest area of organic vineyard in Portugal, reinforcing the family's commitment to sustainable agriculture in this uniquely beautiful mountain wine region.

Many of the region's finest *Quintas* belong to the family: Quinta do Vesuvio, Malvedos, Bomfim, Cavadinha, Senhora da Ribeira, Tua, Canais, Retiro and Roriz (the latter with the Prats family of Bordeaux). The family is alone amongst the Port companies in that they all own and farm their own privately owned vineyards.

At the major international wine competitions such as the International Wine Challenge, Decanter World Wine Awards and International Wine & Spirit Competition, the Symington family's Ports have consistently won more awards than any other Port producer over the last three decades and are the only Port producer in the 21<sup>st</sup> century to have been awarded a perfect 100 points by the Wine Spectator with Dow's 2007 Vintage Port. The Dow's 2011 was also Wine Spectator's highest ranked Vintage, scoring 99 points.

The Symington family leads the way in innovation and research in Douro viticulture and winemaking, with important experimental vineyards at Cavadinha in the Pinhão Valley and at Ataíde in the Vilariça Valley. The family also developed the modern treading 'lagares' — the most significant advance in the production of premium quality Ports for many years.

The Symingtons are amongst the pioneers in the development of Douro DOC wines, producing such wines as Chryseia, Post Scriptum (both with the Prats family), Quinta do Vesuvio and Altano. Chryseia was the first Portuguese still wine ever to appear on the Wine Spectator list of the 100 Best Wines of the World.

The family commitment to the Douro and its wines is stronger than ever after fourteen generations and 350 years, an unparalleled family tradition. The family's considerable contribution to the wines of the Douro Valley was recognized in 2012 when Decanter Magazine named Paul Symington as 'Decanter Man of The Year', the first time a producer from Portugal was granted this prestigious accolade. During the 1980s and 1990s, Paul's cousin Peter was awarded the Fortified Winemaker of The Year title a record six times at the prestigious International Wine Challenge. His son and successor Charles has also been awarded this accolade once.

In November 2014 the family's dedication to the wines of the Douro was further recognized when the influential Wine Spectator magazine ranked Dow's 2011 Vintage Port as the N° 1 Wine of the Year 2014 in its annual TOP 100 Wines of the World listing. Another wine, made by the family jointly with the Prats family of Bordeaux, Chryseia Douro DOC 2011, was placed in the N°3 position. This momentous achievement represents a turning point in the worldwide awareness of the wines of the Douro.



**Role in the project**

As end-user, SYM will provide a Crop-forcing demosite under Atlantic climatic conditions. This site will be used to validate all models developed and adjusted at the Spanish demosite, where the model will be monitored and validated for Mediterranean climatic conditions. SYM will participate in WP1 and WP3 contributing to the definition of the end-user requirements, co-designing the visualization on the DSS and as mobile application. Additionally, SYM will provide a pilot site for WP4 for the application and evaluation of the final results of the DSS. Finally, SYM will participate in WP5 in the Dissemination and Communication task, and in the task devoted to Exploitation of results by exploring the market application of VISCA in their field.

**Key Personnel Involved****Fernando José Martins dos Santos Alves (Male)****Position in Organisation**

R&D Manager Viticultura

**Role in the project**

Field experiments manager, validation results

**Profile**

Received his BSc in Agricultural Engineering and his post graduate diploma in Plant Science-Viticulture from the University of Tras-os-Montes and Alto Douro - Vila Real. Since 1987 he has worked at ADVID, serving as both Technical Director of Viticulture and Executive Director of the association and also responsible by the candidature of ADVID to Cluster Douro Wine, under the Collective Efficiency Strategies of POFC-QREN. Since 2013 is the R&D manager for viticulture in Symington Vinhos SA. His main areas of interest and research are in climate change, crop protection, grapevine physiology, grapevine water stress and efficiency of the grape production.

**Pedro Maria Leal da Costa (Male)****Position in Organisation**



Head of Viticulture

**Role in the project**

Fields experiments manager, validation results

**Profile**

Graduate in in Agricultural Engineering at the Escola Superior Agrária de Santarém - Instituto Politécnico de Santarém, and a MBA at Instituto Português de Administração de Marketing (IPAM). Working as advisor for soil and plant nutrition with several trainings released in the EUA, and as viticulture chief at Codorniu, S.A. Dept Viticultura, Raimat, Lerida and Bodegas Bilbainas, Haro, La Rioja, Spain. Since 2007 take a position in Symington Vinhos SA as Head of Viticulture.

Frank Steven Scott Rogerson (Male)	
	<b>Position in Organisation</b> R&D Manager Oenology
	<b>Role in the project</b> Oenology lab manager
<b>Profile</b> <p>PhD in Food Science and Engineering by the Escola Superior de Biotechnologia, Universidade Católica, and a Post-Doc at Universidade do Porto at the Chemistry Department. Since 1997 works for Symington Vinhos SA first as R&amp;D advisor and since 2002 as R&amp;D Manager in Oenology.</p> <p>The main areas of interest are wine fermentations of investigations in during the grape harvest, and the wine in the bottle / barrel, but also the development the new techniques of quality control. Since 2008, the work also incorporated the study the impact of the level of vigor vine / vines in quality grape / wine and wine produced. More than 150 reports have been written and some of the published.</p>	
Mário João Ventura Natário (Male)	
	<b>Position in Organisation</b> Viticulturist
	<b>Role in the project</b> Field experiment manager
<b>Profile</b> <p>Graduate in in Agricultural Engineering at the Universidade de Trás-os-Montes e Alto Douro (UTAD) in 1997. Until 2005 works as viticulture consultant, and in 2005 join the Symington Vinhos SA viticulture team with responsibility at moment as viticulturist and site manager for near 200ha of vineyards.</p>	
Relevant Publications	
<ol style="list-style-type: none"> <li>1. Alves F., Rogerson F., João S., Veiga R., Oliveira I., Ferreira H., Gonçalves B. (2016). <b>Vineyard drought adaptation in the Douro Demarcated Region.</b> <i>ClimWine Bordéus</i>. Bordeaux (11-14 april)</li> <li>2. Alves F., Rogerson F., Costa P., Gonçalves I., Leal Da Costa P., Symington C. (2016). <b>Effects of rootstock in dynamic of ripening of cv's Touriga Nacional and Touriga Franca in Douro Region.</b> <i>ClimWine Bordéus</i>. Bordeaux (11-14 april)</li> <li>3. Alves F., Rogerson F., Sérgio Joao S., Veiga R., Oliveira I., Ferreira H., Gonçalves B. &amp; Symington C. (2016). <b>Grapevine Drought Stress Adaptation Strategies. Case Study In Cv. Touriga Nacional And cv. Touriga Franca In The Douro Region.</b> <i>XI International Terroir Congress – Willamette Valley, Oregon – July 10-14.</i></li> <li>4. Alves F., Costa J., Costa P., Correia C., Gonçalves B., Soares R., Moutinho-Pereira. J. (2013). <b>Grapevine water stress management in Douro Region: Long-term physiology, yield and quality studies in cv. Touriga Nacional.</b> <i>18<sup>th</sup> International Symposium GiESCO 2013</i>. Porto, 7-11 Jul.</li> <li>5. Alves F., Edlmann M., Costa J., Costa P., Macedo P., Leal Da Costa P., Symington C. (2013). <b>Heat requirements and length of phenological stages. Effects of rootstock on red grape varieties at Douro Region.</b> <i>18<sup>th</sup> International Symposium GiESCO 2013</i>. Porto, 7-11 Jul.</li> </ol>	
Relevant Products	
n.a.	

Relevant Projects or Activities
<i>n.a.</i>
Relevant Patents
<i>n.a.</i>

Significant infrastructure and/or major items of technical equipment
Demosite of vineyards (1000 m <sup>2</sup> ) in Quinta do Ataíde (Alto Douro) where to apply the Crop Forcing Technique for two years (second and third project years). SYM doesn't need any additional infrastructure than that of normal operation of the Vineyard.

Complementarities between partners
SYM will provide the demosite for testing VISCA in Portuguese vineyards, which are under Atlantic climatic conditions. There will be very close collaboration between UPORTO (Portuguese research partner) and them, since UPORTO will be the link with the Spanish research center. IRTA will be the technical leader of the crop-forcing model implementation; UPORTO will validate the models on SYM demosite. Some field monitoring will be required in Portugal demosite, which will be performed by UPORTO and SYM.

#### 4.9 Universidade do Porto – Faculdade de Ciências (U.PORTO)

**Participant Identification Code (PIC):** 999894916

**Partner website** [www.fc.up.pt](http://www.fc.up.pt)

##### Partner Description

The **Faculty of Sciences of the University of Porto (FCUP)** is one of the oldest and largest schools of the University of Porto. It was established in 1911 and has been providing high-quality training in the field of exact and natural sciences and mathematics. Over the years it has been incorporating other fields of studies, such as Geographical Engineering, Astronomy, Computer Science and Information Technology, Biochemistry, Landscape Architecture, Environmental and Agricultural Sciences. FCUP currently hosts six academic departments and six high-performing Research and Development Units: the centres of theoretical physics (CFP), geology (CGUP) and mathematics (CMUP), along with CICGE (Geo-Space Sciences Research Centre), CIQUIP (Chemical Research Centre) and IFIMUP (Applied Physics Centre). FCUP is also partnered with twelve other R&D Units. Offering more than 70 teaching programmes, FCUP has a highly-qualified teaching and research staff responsible for providing a high-quality education, at both undergraduate and postgraduate levels. Besides its core infrastructures, FCUP also incorporates other buildings, such as a Marine Zoology Station, a Geophysical Institute, Botanical Gardens, a Science Museum, an Astronomical Observatory, a Museum of Natural History and a museum with an old collection of documents. FCUP also provides external services related to documents and handwriting examination, statistics and physics. Above all, FCUP remains committed to exploring the opportunities for cooperation and collaboration, not only inside UPORTO, but also with other Portuguese and international entities.

##### Role in the project

The **Faculty of Sciences of the University of Porto (FCUP)** will give scientific and technical support to all tasks that will be performed by the partner Symington Family Estates, including support to collection and analysis of data, elaboration of reports and dissemination of results, either in a form of scientific either technical documents. UPORTO will provide support to IRTA during the application of their Crop-forcing models at SYM demosite.

##### Key Personnel Involved

###### PhD Jorge Queiroz (Male)



##### *Position in Organisation*


Assistant Professor

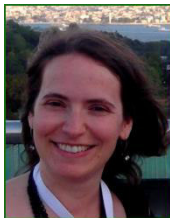
##### *Role in the project*

Coordinator of the Portuguese demosite, application and validation of the phenological models and providing technical support to IRTA partner.

##### *Profile*

He has over 13 years of experience working on vineyard management. He has worked as a Professor of Viticulture and Oenology, University of Porto (Portugal) and as Professor in the Master in Viticulture and Oenology for over 10 years. Additionally, he holds a PhD in Agronomic Sciences and a Master in Viticulture and Enology.

PhD Ana Aguiar (Female)	
	<b>Position in Organisation</b> Assistant Professor
	<b>Role in the project</b> Participation in the Portuguese demosite, application and validation of the phenological models and providing technical support to IRTA partner.
<b>Profile</b> Ana Aguiar has a PhD in Agricultural Engineering from the Higher Institute of Agronomy / UTL (Lisbon, Portugal) and graduation in Agronomic Engineering from the University of Trás-os-Montes and Alto Douro (Vila Real, Portugal). She was technical at Agriculture Department from 1996 to 1989 and agricultural entrepreneur until 1991. She is currently Assistant Professor at the Faculty of Sciences of University of Porto and develops research in the area of integrated pest management. Among the works we highlight the participation in the book "Integrated vine protection in the North of Portugal" in 2001.	

PhD Susana M.P. Carvalho (Female)	
	<b>Position in Organisation</b> Assistant Professor
	<b>Role in the project</b> Team member, supporting the application and validation of the phenological models and providing technical support to IRTA partner.
<b>Profile</b> During the last 15 years of research, Dr. Carvalho has been mostly focused on ecophysiology, plant physiology and water relations of horticultural crops. Author of about 75 publications in this field (including 39 articles ranked in ISI <a href="http://orcid.org/0000-0001-7157-1079">http://orcid.org/0000-0001-7157-1079</a> ) and has presented more than 45 communications in international congresses. S Carvalho was the coordinator of 6 R&D projects (attracting a total of 1.2 M€ of competitive funding) and actively participated as member of the research team in several other R&D projects, including 2 EC projects.	

Relevant publications, products or services
<ol style="list-style-type: none"> <li>1. Tournour H.H., Segundo M.A., Magalhães L.M., Barreiros L., Queiroz J. &amp; Cunha L.M. (2015). <b>Valorization of grape pomace: Extraction of bioactive phenolics with antioxidant properties.</b> <i>Industrial Crops and Products</i> 74 (2015) 397–406. DOI: 10.1016/j.indcrop.2015.05.055</li> <li>2. Carneiro A., Pereira O., Cunha M. &amp; Queiroz J. (2015). <b>The Diagnosis and Recommendation Integrated System (DRIS) – First Approach for the Establishment of Norms for Vineyards in Portugal.</b> <i>Ciência Téc. Vitiv.</i> 30(2) 53-59. 2015. DOI: 10.1051/ctv/20153002053</li> <li>3. Oliveira M., Teles J., Barbosa P., Olazabal F. &amp; Queiroz, J.( 2014). <b>Shading of the fruit zone to reduce grape yield and quality losses caused by sunburn.</b> <i>J. Int. Sci. Vigne Vin</i>, 2014, <b>48</b>, 179-187.</li> <li>4. Cargnello G. &amp; Queiroz J. (2013). <b>ARPALYS 2/3 QC1: Sémantique et analyse de la soutenabilité technique, économique, environnementale, sociale, existentielle, éthique de façon « metaéthique » selon la « grande filière metaéthique » de cet intéressant model productif viticole crée pour les terrains en forte pente et/ou en terrasses.</b> <i>Ciência e Técnica Vitivinícola – Volume 28.</i></li> <li>5. Cargnello G., Queiroz J., Carbonneau A., de Castro R., Murisier F. (2013). <b>Viticultures difficiles et héroïques : recherches sur des modèles de viticulture « vieux-nouveaux » et convenables au niveau économiques, socio-environnemental, existentiel, éthique de façon « metaéthique »</b> <i>Ciência e Técnica Vitivinícola – Volume 28.</i></li> </ol>

<b>Relevant publications, products or services</b>
<i>n.a.</i>
<b>Relevant projects or activities</b>
<p><b>1. Promoting Agri-food and Forestry Stakeholder Engagement for Knowledge Transfer and SMARTAgriFor partnerships (Role: Core member from U.Porto)</b>  <b>Funded by:</b> Portuguese Foundation for Science and Technology  <b>Years:</b> 2016-2017  <b>Description:</b> Improving knowledge transfer between Universities and Companies in key value chains (including grapevine/wine ; fruits and vegetables ; olives/olive oil ; forestry)  Participating Institutions: UTAD; UM; UP; UCP and Wageningen University</p> <p><b>2. SMARTAgriFor: Collaboration to develop a business plan for the Centre of Agriculture and Forestry (Role: Task leader)</b>  <b>Funded by:</b> H2020 - European Union  <b>Years:</b> 2015-2016  <b>Description:</b> Development of a business plan for the creation of a Portuguese Centre of Agriculture and Forestry, Team up with Wageningen University  Participating Institutions: FCT; UTAD; UM; UP; UCP; UA; UC; UL; UNL; INIAV; UE; Wageningen University; DLO.</p> <p><b>3. Condução de videiras em patamares estreitos (de 1 linha) na Região do Douro. (Coordinator)</b>  <b>Funded by:</b> Agricultural Ministry  <b>Years:</b> 2003-2007  <b>Description:</b> Mountain viticulture: implanting and training systems in steep slope regions</p> <p><b>4. Estabelecimento de padrões nutricionais para a videira, oliveira, actínídea e cerejeira com recurso ao sistema integrado de diagnóstico e recomendação (DRIS) (Coordinator)</b>  <b>Funded by:</b> Associação de Desenvolvimento e Inovação (ADI), PRIME - IDEIA  <b>Years:</b> 2006 - 2008  <b>Description:</b> Diagnosis of nutritional status of vines, olive, kiwis, and cherry trees.</p> <p><b>5. Formation à la prévention des risques phytosanitaires dans le secteur agricole (Participant)</b>  <b>Funded by:</b> Project OSHA /SME, da "Université Bordeaux 1, Département HSE, IUT  <b>Years:</b> 2003-2004  <b>Description:</b> Elaboration des matériels about prévention des risques phytosanitaires</p>
<b>Relevant publications, products or services</b>
<i>n.a.</i>
<b>Significant infrastructure and/or major items of technical equipment</b>
Amphitheaters for common use: 2270 m2 Classrooms for common use: 2290 m2 Laboratórios: 1000 m2 Libraries: 1190 m2 Computer rooms use common: 390 m2 Study rooms: 580 m2 Other (bar, restaurant): 760 m2 Experimental and demonstration vineyard: 7500 m2

1 Scholander Chamber model  
1 IRGA LICOR 4  
Diversified laboratory equipment

#### **Complementarities between partners**

UPORTO will bring their knowledge in the field of models applied in the vineyards, especially under Atlantic climatic conditions. There will be very close collaboration between IRTA (Spanish research partner) and them, since UPORTO will be the link with the Portuguese end-user. IRTA will be the technical leader of the crop-forcing model implementation, and will guide UPORTO to validate the models on their demosite. Some field monitoring will be required in Portugal demosite, which will be performed by UPORTO and SYM.



#### 4.10 Technical Unit of the Euro-Mediterranean Information System on know-how in the Water sector (GEIE UT-SEMIDE)



**Participant Identification Code (PIC):** 955902409

**Partner Legal Name and Short Name:** SEMIDE

**Partner website:** [www.emwis.net](http://www.emwis.net) / [www.semide.net](http://www.semide.net)




**Partner Description** SEMIDE is a strategic tool for exchanging information on the water sector among the Euro-Mediterranean Partnership countries. It focuses on assisting the Mediterranean Partner Countries to develop their own water intranets and to allow more coherent water planning. SEMIDE aims at collecting and facilitating the sharing of information and experiences, as well as the development of common tools and cooperation programmes in the water sector. It provides members with a means to collect exchange and disseminate such information particularly regarding water stress issues in the Mediterranean region. In addition, SEMIDE has been translating EU Water Frame Directive principles and the European Union Water Initiative lessons as well as European water innovation practices to the southern Mediterranean countries (Northern Africa), and SEMIDE has contributed significantly to the Mediterranean Water Strategy and the Strategy for Water in the Western Mediterranean (WSWM) which among other priorities includes: Fostering research and innovation. SEMIDE is disseminating information in cooperation with 22 National Focal Points, presented countries in North and South the Mediterranean, using various means from multilingual websites, e-news flash (30 000 subscribers), social networks, multimedia support, physical products as well as events with stakeholders.


##### **Role in the project**

SEMIDE will mainly lead the dissemination and communication activities of VISCA project. It will ensure that the project objectives, activities and outcomes reach the relevant target groups (such as irrigation and agricultural communities, farmers, wine makers, educational and training organisations and policy-makers) in and beyond the demo site countries and prepare for the market uptake of VISCA's tool.

SEMIDE will also support networking with relevant initiatives and projects related to vineyard and agriculture in general to address the synergies and replicability. Projects include H2020 collaborative projects (e.g. WINETWORK, VitiSmart), FP7 projects (e.g. WEAM4i), Life projects (e.g. AgroClimaWater, HelpSpoil) and others such as ClimAware project. Supporting networks may include WineTech and the EIP water action group WIRE. Furthermore, SEMIDE will also analyse how complementary funding mechanisms could be mobilised for further deployment of VISCA projects (e.g. structural funds).

SEMIDE will manage the overall implementation of the dissemination plan and the delivery of its deliverables and reporting on its progress and activities in close cooperation with the coordinator of the project, the exploitation manager and the rest of project partners. SEMIDE will use its broad network in Mediterranean countries mainly representing the water and agriculture communities (including countries where vines are cultivated even if not for wine production). Finally, it will identify the most important channels to communicate the project as globally as possible.

Key Personnel Involved	
<b>Eric MINO (Male)</b>	
	<p><b>Position in Organisation</b> Director</p> <p><b>Role in the project</b> Mr. MINO will be the Dissemination Manager of the project VISCA. He will be in charge of mapping out a plan for the project's impact and dissemination strategy in collaboration with the project partners. He will also ensure networking with relevant initiatives.</p>
<p><b>Profile</b> Electronics and Computer Science Engineer, 25 years of experience in project management, shared water information systems, user requirements and their translation into specifications. Strong knowledge and network of contacts with water authorities, basin agencies, European Commission, EEA and international institutions. Good knowledge of WFD and water directives, INSPIRE, SEIS, WISE and UN water accounting. Relevant experience in water quality and quantity monitoring networks, remote sensing, monitoring data collection and indicators development.</p>	
<b>Maha AL-SALEHI (Female)</b>	
	<p><b>Position in Organisation</b> Communication Officer</p> <p><b>Role in the project</b> Maha will be in charge of preparing the communication products, electronic communication, liaising with the stakeholders, preparation and participation into events</p>
<p><b>Profile</b> A holder of a bachelor degree (1st ranked student with honours) in Environmental Management from Skema Business School, Sophia Antipolis-France. Maha has been involved in research and demonstration projects co-financed by the EC since January 2014. Maha has an experience in conducting dissemination and communication strategies, environmental studies &amp; analysis and project management.</p>	
<b>Maroua OUESLATI (Female)</b>	
	<p><b>Position in Organisation</b> Information Manager</p> <p><b>Role in the project</b> Maroua will bring her knowledge about agricultural management to develop the community of stakeholders.</p>
<p><b>Profile</b> She has been working as an information manager at SEMIDE since September 2015. Maroua is an engineer in natural resources management and she has a Master of Science from CHIHEAM-IAMM on Agricultural Management and Territories. In 2014, she worked at the UfM secretariat in Water &amp; Environment Division.</p>	

<b>Lidy THOMAS (Female)</b>	
	<b>Position in Organisation</b> Administrative assistant
	<b>Role in the project</b> Lidy will support all logistical support for the project, in updating office databases and carrying out general administrative tasks. She will be responsible for organising seminars and making travel arrangements.
<b>Profile</b> She has a university degree in economics, specialising in international commerce, and speaks fluent French, English and Spanish. She developed her carrier in the water sector within the CEFIGRE (training center for water resources management) and later within the International Office of Water. She joined the SEMIDE team at its creation in 1999 with financial and organisational responsibilities, in particular for seminars and conferences arrangements.	

Relevant publications, products or services
<ol style="list-style-type: none"> <li>1. Lajili-Ghezel L., Stambouli T., Weslati M., Souissi A.( 2014). <b>Virtual Water and Food Security in Tunisian Semi-Arid Region.</b> <i>Agriculture, Forestry and Fisheries</i> Vol. 3, No. 5, 2014, pp. 341- 345. doi: 10.11648/j.aff.20140305.12</li> <li>2. Souissi A., Benalaya A., Abdelkefi B., Stambouli T.,Ghezel L., Belaid R., Naceur Y., Oueslati M., Fekih S.,Benabdallah S, Frija A. (2013). <b>Contribution of virtual water to improving water security in Tunisia: a case study of wheat and olive growing farms in zaghouan region.</b> <i>Fourth International Scientific Symposium Agrosym 2013</i>, Jahorina, Bosnia and Herzegovina, 3-6 October, 2013. Book of Proceedings 2013 pp. 1187-1193</li> <li>3. El Kharraz, Alaa El-Sadek, Noredine Ghaffour, Eric Mino (2012). <b>Water scarcity and drought in WANA countries.</b> <i>Procedia Engineering Journal</i>, 33 pp: 14-29; © 2012 Published by Elsevier Ltd. Selection and peer-review under responsibility of ISWEE'11</li> <li>4. Juan Canovas Cuencas and A. (2006). <b>Study on irrigation water management in the Mediterranean Region: General Report.</b> <i>SEMIDE/EMWIS report for water and irrigation director of Euromed countries</i>, December 2006</li> <li>5. Eric Mino, et al. (2010). <b>Status report on inland water quality monitoring in the Mediterranean.</b> <i>MED JOINT PROCESS WFD-EUWI</i>, 2010-12-08 <a href="http://www.emwis.net/topics/watmon/">http://www.emwis.net/topics/watmon/</a></li> </ol>
Relevant publications, products or services
n.a.
Relevant projects or activities
<ol style="list-style-type: none"> <li>1. <b>demEAUmed: Demonstrating integrated innovative technologies for an optimal and safe closed water cycle in Mediterranean tourist facilities, SEMIDE is the dissemination manager.</b>  <b>Funded by:</b> EC DG Research, FP7 Inno&amp;Demo  <b>Years:</b> 2014-2017  <b>Description:</b> demEAUmed aims to involve industry representatives, stakeholders, policy-makers and diverse technical and scientific experts in demonstrating and promoting innovative technologies, for an optimal and safe closed water cycle in the Euro-Mediterranean tourist facilities, leading to their eventual market uptake. Its objective is to reduce fresh water consumption in hotel installations, green and recreational areas, etc.</li> <li>2. <b>SAID: SmArt water management with Integrated Decision support systems. SEMIDE is the dissemination manager</b></li> </ol>

**Funded by:** EC DG Research, FP7 Inno&Demo

**Years:** 2014-2017

**Description:** The objective of SAID project is increasing the knowledge and confidence of all stakeholders (water authorities and managers, governments and EU authorities, companies and society) in existing pre-commercial technology to build operational smart water management systems in Europe. In that way, SAID project will contribute to the implementation of the European directives and policies and to increase the market opportunities for specialist SMEs in monitoring, communications and software technologies for DSSs.

**3. WEAM4i: Water & Energy Advanced Management for Irrigation. SEMIDE is the dissemination manager**

**Funded by:** EC DG Research, FP7 Inno&Demo

**Years:** 2013-2017

**Description:** WEAM4i aims to improve the efficiency of water use and reduce the costs of power irrigation systems through developing a smart network (grid) for the management of irrigation that will act interactively on the rational use of water and energy.

**4. R-KNOW: Regional water knowledge on water**

**Funded by:** EC

**Years:** 2012-2016

**Description:** The project aspires to create a Regional Knowledge Network on Water that will assist in strengthening the application of systematic approaches to water management and governance in five countries (Lebanon, Jordan, Palestine, Morocco and Egypt). It also aims to influence policy and decision-making processes as means to enhance good governance in the water sector.

**5. WISE: Towards a Mediterranean Water Information Mechanism compatible with the water information System for Europe, SEMIDE was the coordinator of this project.**

**Funded by:** EC ENRTP (DG Env).

**Years:** 2008-2010

**Description:** The objective of this project is to prepare a Mediterranean information mechanism on water which is compatible with the Water Information System for Europe –WISE- and that will support the Med Joint Process between the EU Water Initiative and the Water Framework Directive. This mechanism will stream line the access to quality data related to water in the Mediterranean Partners Country (MPC).

**Relevant publications, products or services**

*n.a.*

**Significant infrastructure and/or major items of technical equipment**

SEMIDE will provide its web server infrastructure for building the project website and dissemination information to the stakeholders.

**Complementarities between partners**

UT SEMIDE and METEOSIM were part of WEAM4i consortium, as dissemination manager and project coordinator respectively.

**Participant Identification Code (PIC):** 950979950

**Partner website** [www.alphacons.eu](http://www.alphacons.eu)

#### Partner Description

ALPHA is a newly formed English consultancy, owned by ALPHA Consultants srl, a European management and technology consultancy supporting businesses, regulators and European institutions. We are recognised as one of the leading independent experts in Satellite Navigation (GNSS), Earth Observation (EO), Intelligent Transport System (ITS) and Unmanned Aerial Vehicles (UAVs), and are increasingly active across other supporting and related markets (chiefly Aerospace, Transportation, Agribusiness, Medical devices, Telecommunications, Emergency response and management).

ALPHA provides its advices to institutional and private clients operating in Europe and in Africa, guaranteeing:

- Senior staff with experience in strategic development, market assessment and business modeling
- A rigorous, fact-based and analytical approach with emphasis on “data-drive” rather than “ideas-driven” analysis
- The ability to rapidly obtain, absorb and prioritize data, and then draw out and communicate the key conclusions concisely and succinctly while under considerable time pressure

#### Role in the project

Leader of Task 1.4 “Innovation Management. Engagement with the Advisory Board and end users” and Task 5.4. Exploitation. It will also support and contribute to other project activities, such as the overall project management, the end user requirement definition, the demonstrations and dissemination actions.

#### Key Personnel Involved

##### Emiliano Spaltro (Male)



#### *Position in Organisation*

Managing Partner

#### *Role in the project*

Emiliano will be the responsible for the overall quality of the activities undertaken by the ALPHA team all over the project, guiding WPs under ALPHA leadership. Moreover, given his background as business consultant he will also provide hands-on support as needed.

#### *Profile*

Emiliano Spaltro is ALPHA’s Director. He holds a degree cum laude in Business Administration and a second degree in Law. Moreover, he is a certified international investment analyst (CIIA) and a certified EFFAS financial analyst (CEFA). He has worked in leading consultancies (Roland Berger, Stern Stewart, Ambrosetti and LEK), following pan-European transportation, tlc, space and IT projects.

##### Claudia Maltoni (Female)



#### *Position in Organisation*

Project Manager

#### *Role in the project*

Claudia will operationally drive all the Tasks under ALPHA responsibility and she will support VISCA team in all the activities requiring ALPHA involvement.

**Profile**

ALPHA's Project Manager, Claudia Maltoni holds a MSc in Economics, participated to "2 ECTS Ph.D course of ESA/ JRC International Summer Schools on GNSS" in 2015. Prior to joining ALPHA, Claudia had former experiences in other consulting boutiques, like Equiteam and Resolving Strategy Finance. She speaks English, French and German.

**Juan José Grosso (Male)****Position in Organisation**

Senior GNSS Engineer and Project Manager

**Role in the project**

Due to his background, Juan José will support the ALPHA team in all the tasks where integration of technical and business know-how is deemed fundamental.

**Profile**

Juan José Grosso is ALPHA's Senior Engineer. He holds an engineering degree in telecommunications and a specializing master in satellite navigation from Politecnico di Torino. He is fluent in three languages (Spanish, Italian and English). Juan José has worked for Motorola, Nokia Siemens Networks and ClariPhy, Inc. (fiber optics). Apart from his technical background, Juan José is positively interested in a business-oriented field of action and he is keen on the analysis and development of businesses in the road and traffic management industries.

**Relevant publications, products or services**

*n.a.*

**Relevant projects or activities****1. I-REACT: Improving Resilience to Emergencies through Advanced Cyber Technologies**

**Funded by:** EC

**Years:** 2016-18

**Description:** Extreme weather events exacerbated by climate change are an increasing threat to human societies, which are increasingly exposed and vulnerable to natural disasters. I-REACT will realize a comprehensive Emergency Management System (EMS). I-REACT integrates existing services at both local and European level, into a platform that provides additional services, namely detailed risk assessments, online and real-time nowcasting and forecasting systems that exploit different data streams including Earth Observations (EO), Unmanned Aerial Vehicles (UAVs), crowdsourcing, and social media. I-REACT exploits cyber technologies and innovative ICT systems in order to implement an integrated platform that can provide services to support the whole crisis management, linking awareness and early warning to effective responses within society, involving and empowering citizens, and coordination with first responders, to gain time and improve coordination in emergency situations. The targeted existing systems encompass solutions already used by first responders as well as European assets such as the Copernicus Emergency Management Service, the European Flood Awareness System (EFAS), the European Forest Fire Information System (EFFIS) and Global Navigation Satellite System (GNSS).

**2. FLOODIS: Integrating GMES Emergency Services with satellite navigation and communication for establishing a flood information service**

**Funded by:** EC

**Years:** 2013-15

**Description:**

- Flooding is becoming a major problem in Europe and the ability to intervene prior, during and after the emergencies has become a key topic in the European Commission agenda.



- FLOODIS has the objective of exploiting European satellite technologies to support populations affected by flood event in Europe and worldwide. To this extent, FLOODIS will combine Earth Observation (EO) and GNSS (Galileo/ EGNOS) technologies to deliver information (alerts and interactive maps) on flooding risk/ events and affected infrastructures to users in the field that are in the geographical area at risk.

### **3. Agriculture development in Africa leveraging satellite-based technologies (EO and GNSS)**

**Funded by:** EC

**Years:** 2011-14

**Description:**

The project was articulated on:

- Identification of the state of the art for satellite-based technology usage in Africa, also liaising with FP7 projects (e.g., SATSA)
- Analysis of benefits brought by EO/ GNSS to agriculture and related capex and opex (leveraging chiefly on European experiences)
- Prioritization of cultivations to address (in terms e.g. of absolute volumes, of added value by cultivation, and of importance for the economies/ for poverty reduction)
- Prioritizations of countries to address (exploiting a multi-criteria analysis able to consider e.g., country specific economic factors, size/ types of cultivations, demography/ poverty reduction potential, mechanization level and impact of weather/ climate change)
- Iterations of main assumptions and early results with key African stakeholders
- CBA aimed at identifying added value by country and by cultivation to use EO and/ or GNSS in agriculture in Africa

#### **Relevant patents**

n.a.

#### **Significant infrastructure and/or major items of technical equipment**

n.a.

#### **Complementarities between partners**

ALPHA is a strategy and business consultancy with expertise in various industries. ALPHA's core activities are market/ competitive environment assessments, business plans, costs benefits analysis (CBA), preparation of go to market strategies, and road map definitions.

Given ALPHA peculiar business expertise, the consortium will benefit of a non-technical and independent business counterpart to analyze, triangulate and validate main market trends, thus identifying potential market opportunities for VISCA and fostering solution adoption.

Moreover, ALPHA has a consolidated experience in user and stakeholder involvement. This experience will be leveraged by the team for both end-user requirement collection and for commercial purposes.



#### 4.12 Multidisciplinary and complementarity of competences of VISCA consortium

Competences	METEOSIM	BSC	CODORNIU	IRTA	ISMB	U. NAPOLI	MASTROBERARDI NO	SYMINGTON	U. OPORTO	SEMIDE	ALPHA CONSULTANT
Climate services	✓	✓									
Weather events	✓	✓									
Nowcasting/Forecasting	✓	✓				✓			✓		
Irrigation planning				✓		✓			✓		
Phenological models				✓		✓			✓		
Software development		✓			✓						✓
Mobile applications					✓						✓
Decision support systems		✓			✓						
Risk Analysis			✓	✓	✓		✓	✓		✓	✓
Social Media analysis			✓				✓	✓		✓	✓
Business assessment	✓		✓				✓	✓			✓
End-user requirements	✓		✓	✓		✓	✓	✓	✓	✓	✓
Communication and dissemination						✓			✓	✓	
Open and linked data management	✓		✓		✓		✓	✓		✓	

## 5 ETHICS AND SECURITY

### 5.1 Ethics

VISCA project does not do innovation actions that invoke any of the ethical issues mentioned in the ethical issues table in the administrative proposal forms.

VISCA will work in crops applying the current techniques that are already being used and which are already regulated and according to the national and EU regulations. No harm to the environment is foreseen, no illegal substances are going to be used in the demosite plots, furthermore, some of the test sites are currently using ecological agriculture techniques.

### 5.2 Security

VISCA does not pose any threat to security nor can be used for military purposes.

Please indicate if your project will involve:

Will the VISCA project involve activities or results raising security issues?	<b>No</b>
Will the VISCA project involve “EU-classified information” as background or results?	<b>No</b>

## 6 ADVISORY BOARD - DESCRIPTION

Table below lists the entities supporting VISCA through a letters of interest.

Entity	Description
<b>OIV - International Wine Association</b>	Created in 1924 and since 2001 has become the scientific and technical reference organisation for the entire vitivinicultural field. The OIV is an intergovernmental organisation whose work concerns vines, wine, wine-based beverages, table grapes, raisins and other vine-based products. Its 46 Member States account for more than 85% of global wine production and nearly 80% of world consumption. There are also 10 non-governmental international organisations that participate as observers.
World	<i>They will provide feedback regarding VISCA's application on the wine sector as well as on the barriers that could be encountered worldwide. They will also participate in dissemination activities through their channels worldwide.</i>
<b>INNOVI Catalan Wine Cluster</b>	It is a non-profit organization of 42 members (private and public companies and entities), which mission is to promote the competitiveness of companies of the Catalan wine sector and auxiliary sector, in order to face globalization through innovation and collaboration.
Spain	<i>They will provide feedback on VISCA's tool application in the vine sector and on the possible barriers that could be encountered. They will also participate in dissemination activities.</i>
<b>Plataforma Tecnológica del Vino</b>	This is a forum for the different agents in the Spanish wine industry to come together and deliberate, with the aim of becoming a true business-science network of cooperation capable of defining a common Strategy in the field of R&D&I, led by business.
Spain	<i>They will provide feedback on VISCA's tool application in the vine sector and will help to disseminate VISCA within the Spanish wine sector.</i>
<b>The AssoEnologi</b>	The Assoenologi was founded in 1891, it brings together and represents almost 4,000 technicians throughout the national territory.
Italy	<i>They will provide feedback on VISCA's tool application in the vine sector and will help to disseminate VISCA within the Italian wine sector.</i>
<b>WMO - World Meteorological Organization</b>	WMO is a specialized agency of the United Nations (UN) with 191 Member States and Territories. It is the UN system's authoritative voice on the state and behaviour of the Earth's atmosphere, its interaction with the land and oceans, the weather and climate it produces and the resulting distribution of water resources.
<b>Consultant of UNDP - United Nations Development Programme</b>	The United Nations Environment Programme (UNEP) is the leading global environmental authority that sets the global environmental agenda, promotes the coherent implementation of the environmental dimension of sustainable development within the United Nations system and serves as an authoritative advocate for the global environment.
World	<i>She will provide feedback on VISCA's tool application in the forestry sector and on the possible barriers that could be encountered. She will also participate in dissemination activities.</i>

Entity	Description
<b>IOC - International Oil Council</b>	IOC is the world's only international intergovernmental organisation in the field of olive oil and table olives. Founded in 1959, under the auspices of the United Nations. The Council is a decisive player in contributing to the sustainable and responsible development of olive growing and it serves as a world forum for discussing policymaking issues and tackling present and future challenges.
World	
<b>AEMO - Asociación Española de Municipios del Olivo</b>	AEMO is an association of over 120 Spanish municipalities and provinces which aims at preserving the olive culture.
Spain	<i>They will provide feedback on the Olive oil sector and addressing the replicability opportunities of VISCA in the olive oil sector, while helping to define existing barriers that could be encountered. They will also be involved in disseminating the outcomes of the project within their sector.</i>
<b>CITOLIVA - Olive Oil Technological Center</b>	It is a non-profit foundation created to implement innovative methodologies and technological systems that solve effectively the demands and needs of the olive oil sector. CITOLIVA responds to the challenges identified during years of professional experience, through the professionalization and introduction of innovative and technological strategies in the field of olive and olive oil.
Spain	<i>They will provide feedback on the Olive oil sector and addressing the replicability opportunities of VISCA in the olive oil sector, while helping to define existing barriers that could be encountered. They will also be involved in disseminating the outcomes of the project within their sector.</i>
Mediterranean Area	
<b>DeltaMed - Mediterranean Deltas Association</b>	DELTA-MED was created to consolidate a network of Mediterranean Deltas, with the aim to exchange experiences and knowledge about the problems of the territory and sustainable agriculture.
Mediterranean Area	<i>They will provide feedback on the delta's crop sector and on the possible replicability/barriers that could be encountered.</i>
<b>EEA - European Environmental Agency</b>	The European Environment Agency provides sound, independent information on the environment for those involved in developing, adopting, implementing and evaluating environmental policy, and also the general public. In close collaboration with European Environmental Information and Observation Network and its 33 member countries, the EEA gathers data and produces assessments on a wide range of topics related to the environment.
Europe - Italy	<i>They will provide feedback on the environment and on the possible replicability/barriers that could be encountered; they will also provide feedback on the additional data that could be used in the tool and on the data produced by the tool.</i>
<b>JRC - Joint Research Center</b>	The Joint Research Centre's mission is to support EU policies with independent evidence throughout the whole policy cycle. Its work has a direct impact on the lives of citizens by contributing with its research outcomes to a healthy and safe environment, secure energy supplies, sustainable mobility and consumer health and safety.

Entity	Description
Europe - Italy	<i>They will provide feedback on the environment and on the possible replicability/barriers that could be encountered in the field of forecasting agricultural production at national and continental scales, while addressing replicability opportunities of the tool in related domains and for additional crops.</i>

## **ANNEXES – LETTERS OF SUPPORT**



To: Proposal Coordinator: Dr. Maria Navarro  
METEOSIM S.L  
C/ Baldiri i Reixac 10-12  
08028 Barcelona  
SPAIN

23<sup>rd</sup> February, Vilafranca del Penedès, Barcelona

**[Subject: Letter of commitment to the VISCA proposal as member of the Advisory Board]**

Dear Dr. Navarro,

It is with great interest that we have taken notice of the H2020 *Climate Action* proposal VISCA "Vineyards' Integrated Smart Climate Application" under the call SC5-01-2016, whose topic directly relates to INNOVI. We believe that the project coordination and the consortium have acknowledged expertise, which will allow them to successfully reach the project objectives towards the integration of a tool capable to supply wine companies with well-sustained climatic and fenologic data, essential for crop planning at medium and long term. We likewise foresee the enormous interest of such a tool to empower many other agricultural sectors towards adaptation to climate change.

INNOVI represents the catalan wine cluster. It's mission is to promote the competitiveness of companies that operate in the value chain of the Catalan wine industry in order to face globalization through innovation and cooperation.

We wish with this letter to signal our commitment to become a member of the advisory board of the VISCA project. Our involvement will entail:

- Participation in annual meetings of VISCA aimed at disseminating outcomes of the project and obtaining feedback from interested stakeholders.
- Definition of existing barriers to deploy climate tools in the wine sector.
- Addressing the replicability opportunities of the tool in the wine sector.

It is understood that reasonable expenses for our participation will be covered by the VISCA project.

I hereby confirm that INNOVI fully supports the submission of the VISCA proposal by project leader Dr. Maria Navarro and is willing to participate in this project as member of the advisory board.

Wishing you success with VISCA.

A handwritten signature in blue ink, appearing to be "Clara Santamaria Echaniz".

Clara Santamaria Echaniz  
Cluster Manager  
Associació AEI INNOVI





European Commission

H2020 SC5-01-2016. Exploiting the added value of climate services

Madrid, a 3 de marzo de 2016

Estimados Sres.,

La Plataforma Tecnológica del Vino de España nació en el año 2010 con el apoyo del MINECO y el objetivo de concentrar la demanda tecnológica del sector y apoyar y dinamizar las iniciativas innovadoras de los agentes a él vinculados, buscando su crecimiento y competitividad en los mercados, nacional e internacional.

Una de las actuaciones de la Plataforma a través de sus Grupos de Trabajo, ampara la identificación de potenciales proyectos de I+D o Innovación Tecnológica que tengan interés para el sector vitivinícola nacional. Desde este punto de vista, la Plataforma pretende apoyar institucionalmente a aquellas propuestas empresariales y académicas que se consideren de especial interés por su novedad e innovación y su posible generación de valor en el mercado. Dicha apuesta, se materializa en la presente Carta de Apoyo, con la que se pretende transmitir a la Administración Pública, nacional y autonómica, la apuesta global del sector en la actuación que ésta respalda.

En consecuencia, por la presente queremos transmitir a esa Institución, el apoyo de la Plataforma Tecnológica del Vino de España (PTV) al proyecto de I+D+i presentado por **METEOSIM, S.L.** y que lleva por título ***“Vineyards Integrated Smart Climate Application (VISCA)”*** por su interés científico-técnico para el sector vitivinícola nacional y por alinearse con los objetivos marcados en la Agenda Estratégica de Innovación aprobada en Asamblea General el 29 de noviembre de 2012. El proyecto tiene previsto ser presentado al Programa Europeo H2020 SC5-01-2016: Exploiting the added value of climate services.

El objetivo principal del proyecto es la integración de datos climáticos y fenológicos facilitados por 2 grupos de demostración dentro de una herramienta DSS codiseñada junto a compañías vinícolas relevantes del sur de Europa. Esta herramienta permitirá la toma de decisiones basada en la mejor información para una gestión de producción apropiada (poda, madura, vendimia, etc.), con el último objetivo de hacer a la industria del vino más resistente a los efectos del cambio climático.



ASSOCIAZIONE ENOLOGI ENOTECNICI ITALIANI  
ORGANIZZAZIONE NAZIONALE DI CATEGORIA DEI TECNICI DEL SETTORE VITIVINICOLO  
**ASSOENOLOGI**

SEZIONE CAMPANIA 83100 AVELLINO, VIALE ITALIA – C/O UNIV. DEGLI STUDI DI NAPOLI FEDERICO II  
CORSO DI LAUREA IN VITICOLTURA E L'ENOLOGIA

To: Proposal Coordinator: Dr. Maria Navarro  
METEOSIM S.L  
C/ Baldiri i Reixac 10-12  
08028 Barcelona  
SPAIN

Avellino, 14 luglio 2016

**[Subject: Letter of commitment to the VISCA proposal as member of the Advisory Board]**

Dear Dr. Navarro,

It is with great interest that we have taken notice of the H2020 *Climate Action* proposal VISCA "Vineyards' Integrated Smart Climate Application" under the call SC5-01-2016, whose topic directly relates to **ASSOENOLOGI sezione Campania**. We believe that the project coordination and the consortium have acknowledged expertise, which will allow them to successfully reach the project objectives towards the integration of a tool capable to supply wine companies with well-sustained climatic and fenologic data, essential for crop planning at medium and long term. We likewise foresee the enormous interest of such a tool to empower many other agricultural sectors towards adaptation to climate change.

**ASSOENOLOGI** offers various professional services to its members, ensure the representation of winemakers category in the whole regional territory, and is a target reference point and constructive throughout the wine sector of Campania.

We wish with this letter to signal our commitment to become a member of the advisory board of the VISCA project. Our involvement will entail:

- Participation in annual meetings of VISCA aimed at disseminating outcomes of the project and obtaining feedback from interested stakeholders.
- Definition of existing barriers to deploy climate tools in the [Viticulture and Winemaking].
- Addressing the replicability opportunities of the tool in the [Viticulture and Winemaking].

It is understood that reasonable expenses for our participation will be covered by the VISCA project.

I hereby confirm that **ASSOENOLOGI Campania** fully supports the submission of the VISCA proposal by project leader Dr. Maria Navarro and is willing to participate in this project as member of the advisory board.

Wishing you success with VISCA.

The president,

enol. Roberto Di Meo

ASSOCIAZIONE ENOLOGI ENOTECNICI ITALIANI  
ORGANIZZAZIONE NAZIONALE DI CATEGORIA DEI  
TECNICI DEL SETTORE VITIVINICOLO - ASSOENOLOGI  
SEZIONE CAMPANIA  
IL PRESIDENTE



Our ref.: CLW/CLPA/AGM/VISCA

Proposal Coordinator  
Dr. Maria Navarro  
METEOSIM S.L  
C/ Baldiri i Reixac 10-12  
08028 Barcelona  
SPAIN

GENEVA, 5 September 2016

**Subject: Letter of commitment to the VISCA proposal as member of the Advisory Board**

Dear Dr Navarro,

It is with great interest that we have taken notice of the H2020 *Climate Action* proposal VISCA “Vineyards’ Integrated Smart Climate Application” under the call SC5-01-2016, whose topic directly relates to the World Meteorological Organization (WMO). We believe that the project coordination and the consortium have acknowledged expertise, which will allow them to successfully reach the project objectives towards the integration of a tool capable to supply wine companies with well-sustained climatic and phenological data, essential for crop planning at medium and long term. We likewise foresee the enormous interest of such a tool to empower many other agricultural sectors towards adaptation to climate change.

The WMO Agricultural Meteorology Programme assists the National Meteorological and Hydrological Services and other national institutions of the world to provide relevant weather and climate services to farmers, herders and fishermen in order to promote sustainable agricultural development, increase productivity and contribute to food security.

We wish with this letter to signal our commitment to become a member of the advisory board of the VISCA project. Our involvement will entail:

- Participation in annual meetings of VISCA aimed at disseminating outcomes of the project and obtaining feedback from interested stakeholders.
- Definition of existing barriers to deploy climate tools in the agricultural meteorology and climate sectors.
- Addressing the replicability opportunities of the tool in the agricultural meteorology and climate sectors.

It is understood that reasonable expenses for our participation will be covered by the VISCA project. I hereby confirm that Agricultural Meteorology Programme of the WMO fully supports the submission of the VISCA proposal by project leader Dr. Maria Navarro and is willing to participate in this project as member of the advisory board. I would like to name Dr Jose Camacho as the WMO representative to the advisory board. Wishing you success with VISCA.

Yours sincerely,

(R. Stefanski)

Chief, Agricultural Meteorology Division  
World Meteorological Organization

**To:** Proposal Coordinator: Dr. Maria Navarro  
METEOSIM S.L  
C/ Baldiri i Reixac 10-12  
08028 Barcelona  
SPAIN

Tegucigalpa, 05 march 2016

**[Subject: Letter of commitment to the VISCA proposal as member of the Advisory Board]**

Dear Dr. Navarro,

It is with great interest that we have taken notice of the H2020 *Climate Action* proposal VISCA “Vineyards’Integrated Smart Climate Application” under the call SC5-01-2016, whose topic directly relates to Noelia Jover expertise. We believe that the project coordination and the consortium have acknowledged expertise, which will allow them to successfully reach the project objectives towards the integration of a tool capable to supply wine companies with well-sustained climatic and fenologic data, essential for crop planning at medium and long term. We likewise foresee the enormous interest of such a tool to empower many other agricultural sectors towards adaptation to climate change.

Noelia Jover has a MSc on Climate Change and International Development by the University of East Anglia (UK) and more than 8 years of fieldwork experience in Latin America. Noelia has effectively support the design of the climate change agenda in Honduras under UNDP, guaranteeing financial resources and identifying, planning and implementing climate change national and international processes (adaptation, mitigation and climate finance). Noelia Jover has coordinated the Third National Communication and support the design and initial implementation of the REDD+ process in Honduras, where currently is working as a climate change advisor.

We wish with this letter to signal our commitment to become a member of the advisory board of the VISCA project. Our involvement will entail:

- Participation in annual meetings of VISCA aimed at disseminating outcomes of the project and obtaining feedback from interested stakeholders.
- Definition of existing barriers to deploy climate tools in the forestry sector in Honduras.
- Addressing the replicability opportunities of the tool in the forestry sector in Honduras.

It is understood that reasonable expenses for our participation will be covered by the VISCA project.

I hereby confirm that Noelia Jover fully supports the submission of the VISCA proposal by project leader Dr. Maria Navarro and is willing to participate in this project as member of the advisory board.

Wishing you success with VISCA.

Noelia Jover, Climate Change Advisor





Coordinator of VISCA Project  
Proposal Coordinator: Dr. Maria Navarro  
METEOSIM S.L  
C/ Baldiri i Reixac 10-12  
08028 Barcelona  
SPAIN

### Letter of Support

The International Olive Council (IOC), represented by the undersigned, IOC Executive Director Abdellatif Ghedira expresses its strong support for the “VISCA” project entitled “Vineyards’ Integrated Smart Climate Application” proposal submitted by Ms. María Navarro in response to call SC5-01-2016: Exploiting the added value of climate services (Horizon 2020).

It believes the proposal agrees with the role and purposes of the IOC and that the results of the research will be beneficial for the olive growing in the EU and elsewhere.

If the project is financed, the IOC is interested in:

- Playing an important role in activities relating to the analysis of the project results and their possible dissemination, if they are of interest to the olive sector.
- Extending the project to other parts of the olive sector.

Such involvement may require reimbursement of the participation expenses of IOC in this activity.

The IOC hereby pledges to maintain confidentiality and to refrain from disclosing any information concerning the development of the project proposal or any information supplied to it by other project partners.

This letter of support does not constitute any obligation on the part of the International Olive Council to be linked exclusively to this project and leaves it entirely free to collaborate with other consortia.

  
Abdellatif Ghedira  
Executive Director

Madrid, 31 August 2016





ASOCIACIÓN ESPAÑOLA  
DE MUNICIPIOS DEL OLIVO

**To:** Proposal Coordinator: Dr. Maria Navarro  
METEOSIM S.L  
C/ Baldiri i Reixac 10-12  
08028 Barcelona  
SPAIN

Córdoba, 7<sup>th</sup> March 2016

**[Subject: Letter of commitment to the VISCA proposal as member of the Advisory Board]**

Dear Dr. Navarro,

It is with great interest that we have taken notice of the H2020 *Climate Action* proposal VISCA "Vineyards' Integrated Smart Climate Application" under the call SC5-01-2016, whose topic directly relates to ASOCIACIÓN ESPAÑOLA DE MUNICIPIOS DEL OLIVO (AEMO). We believe that the project coordination and the consortium have acknowledged expertise, which will allow them to successfully reach the project objectives towards the integration of a tool capable to supply wine companies with well-sustained climatic and fenologic data, essential for crop planning at medium and long term. We likewise foresee the enormous interest of such a tool to empower many other agricultural sectors towards adaptation to climate change.

AEMO is an Association of 125 Villages and Provinces of the Spanish territory. The target of AEMO is to promote the development of the farmer and producer of olive oil and olive fruit.

We wish with this letter to signal our commitment to become a member of the advisory board of the VISCA project. Our involvement will entail:

- Participation in annual meetings of VISCA aimed at disseminating outcomes of the project and obtaining feedback from interested stakeholders.
- Definition of existing barriers to deploy climate tools in the olive sector.
- Addressing the replicability opportunities of the tool in the olive sector.

It is understood that reasonable expenses for our participation will be covered by the VISCA project.

I hereby confirm that AEMO fully supports the submission of the VISCA proposal by project leader Dr. Maria Navarro and is willing to participate in this project as member of the advisory board.

The technicals of AEMO proposed for the participation of this project will be:

- Salvador Cubero, Agricultural Engineer.
- José M<sup>a</sup> Penco, Agricultural Engineer.

Wishing you success with VISCA.

Salvador Cubero Navarro  
*Secretario Ejecutivo de AEMO*



**To:** Proposal Coordinator: Dr. Maria Navarro  
METEOSIM S.L  
C/ Baldiri i Reixac 10-12  
08028 Barcelona  
SPAIN

Jaen, 11<sup>th</sup> July 2016

**[Subject: Letter of commitment to the VISCA proposal as member of the Advisory Board]**

Dear Dr. Navarro,

It is with great interest that we have taken notice of the H2020 *Climate Action* proposal VISCA “Vineyards’ Integrated Smart Climate Application” under the call SC5-01-2016, whose topic directly relates to CITOLIVA. We believe that the project coordination and the consortium have acknowledged expertise, which will allow them to successfully reach the project objectives towards the integration of a tool capable to supply wine companies with well-sustained climatic and fenologic data, essential for crop planning at medium and long term. We likewise foresee the enormous interest of such a tool to empower many other agricultural sectors towards adaptation to climate change.

CITOLIVA, the Olive Farming and Olive Oil Technology Centre, is a non-profit foundation established to implement methodologies and systems dealing with technological requirements in the olive oil and table olive sectors.

We wish with this letter to signal our commitment to become a member of the advisory board of the VISCA project. Our involvement will entail:

- Participation in annual meetings of VISCA aimed at disseminating outcomes of the project and obtaining feedback from interested stakeholders.
- Definition of existing barriers to deploy climate tools in the Olive Oil sector.
- Addressing the replicability opportunities of the tool in the Olive Oil sector.

It is understood that reasonable expenses for our participation will be covered by the VISCA project.

I hereby confirm that CITOLIVA fully supports the submission of the VISCA proposal by project leader Dr. Maria Navarro and is willing to participate in this project as member of the advisory board.

Wishing you success with VISCA.

Cristina de Toro Navero



General Manager at CITOLIVA





**To:** Proposal Coordinator: Dr. Maria Navarro  
METEOSIM S.L  
C/ Baldiri i Reixac 10-12  
08028 Barcelona  
SPAIN

Napoli, 29/08/2016

**[Subject: Letter of commitment to the VISCA proposal as member of the Advisory Board]**

Dear Dr. Navarro,

It is with great interest that we have taken notice of the H2020 *Climate Action* proposal VISCA "Vineyards' Integrated Smart Climate Application" under the call SC5-01-2016, whose topic directly relates to **Aprol Campania**. We believe that the project coordination and the consortium have acknowledged expertise, which will allow them to successfully reach the project objectives towards the integration of a tool capable to supply wine companies with well-sustained climatic and fenologic data, essential for crop planning at medium and long term. We likewise foresee the enormous interest of such a tool to empower many other agricultural sectors towards adaptation to climate change.

**Aprol Campania** offers various professional services to its members (more than 16.000 olives and/or olive oil producers) through technical assistance, training and information.

We wish with this letter to signal our commitment to become a member of the advisory board of the VISCA project. Our involvement will entail:

- Participation in annual meetings of VISCA aimed at disseminating outcomes of the project and obtaining feedback from interested stakeholders.
- Definition of existing barriers to deploy climate tools in the olive crop.
- Addressing the replicability opportunities of the tool in the olive crop.

It is understood that reasonable expenses for our participation will be covered by the VISCA project.

I hereby confirm that **Aprol Campania** fully supports the submission of the VISCA proposal by project leader Dr. Maria Navarro and is willing to participate in this project as member of the advisory board.

Wishing you success with VISCA.

The president

Eng. Francesco Maria Acampora

**Aprol Campania - Società cooperativa agricola a r.l.**

VIA GIOVANNI PORZIO N 4 80143 NAPOLI

**P.I.** 00867970659

**NR. ISCRIZIONE AL REGISTRO DELLE IMPRESE DI NAPOLI E C.F.** 80034650657

**REA N.** 93351/NA



**SORTIDA**

4 - MARÇ 2016

1/2016

**To:** ProposalCoordinator: Dr. Maria Navarro  
METEOSIM S.L  
C/ Baldiri i Reixac 10-12  
08028Barcelona  
SPAIN

Amposta, 3rd of March 2016

**[Subject: Letter of commitment to the VISCA proposal as member of the  
Advisory Board]**

Dear Dr. Navarro,

It is with great interest that we have taken notice of the H2020 *Climate Action* proposal VISCA "Vineyards' Integrated Smart Climate Application" under the call SC5-01-2016, whose topic directly relates to DELTA-MED. We believe that the project coordination and the consortium have acknowledged expertise, which will allow them to successfully reach the project objectives towards the integration of a tool capable to supply wine companies with well-sustained climatic and fenologic data, essential for crop planning at medium and long term. We likewise foresee the enormous interest of such a tool to empower many other agricultural sectors towards adaptation to climate change.

We are a non-profit making association called "**Asociación de Deltas del Mediterraneo (DELTA-MED)**", which has been constituted in Amposta (Tarragona). It has legal personality and full capacity to operate in accordance with what is stipulated in article 22 of the Spanish Constitution, the Organic Law 1/2002 of March 22 regulating the right to associate and the other current legislation.

The objectives of the Association are to constitute a permanent forum in order to analyse, discuss and deal with the specific problems of a natural, water, coastal, environmental, economic production and social nature concerning the Mediterranean deltas, particularly with a view to achieving sustainable development in these deltas. In addition, its operations can be extended to dealing with the problems involving the Coastal Wetlands of the Mediterranean area where there are similar issues to those which concern the deltas.



We wish with this letter to signal our commitment to become a member of the advisory board of the VISCA project. Our involvement will entail:

- Participation in annual meetings of VISCA aimed at disseminating outcomes of the project and obtaining feedback from interested stakeholders.
- Definition of existing barriers to deploy climate tools in the influence area of DELTAMED.
- Addressing the replicability opportunities of the tool in the influence area of DELTAMED.

It is understood that reasonable expenses for our participation will be covered by the VISCA project.

I hereby confirm that DELTA-MED fully supports the submission of the VISCA proposal by project leader Dr. Maria Navarro and is willing to participate in this project as member of the advisory board.

Wishing you success with VISCA.

Manuel Masiá Marsá

President



Proposal Coordinator: Dr. Maria Navarro  
METEOSIM S.L  
C/ Baldiri i Reixac 10-12  
08028 Barcelona  
SPAIN

Copenhagen, 25-02-2016

Dear Dr. Navarro,

**Letter of commitment to the VISCA proposal as member of the Advisory Board**

It is with great interest that we have taken notice of the H2020 *Climate Action* proposal VISCA "Vineyards 'Integrated Smart Climate Application'" under the call SC5-01-2016, whose topic directly relates to the work of the European Environmental Agency (EEA). We believe that the project coordination and the consortium have acknowledged expertise, which will allow them to successfully reach the project objectives towards the integration of a tool capable to supply wine companies with well-sustained climatic and phenological data, essential for crop planning at medium and long term. We likewise foresee the enormous interest of such a tool to empower many other agricultural sectors towards adaptation to climate change.

The European Environment Agency (EEA) is an agency of the European Union. Currently, the EEA has 33 member countries. Our task is to provide sound, independent information on the environment. We help the Community and member countries to make informed decisions about improving the environment under increasing climate change impacts on society. Adaptation is an expanding area of work for the EEA. In 2012 the European Commission and EEA launched the European Climate Adaptation Platform ([climate-adapt.eea.europa.eu](http://climate-adapt.eea.europa.eu)) where users can access and share a wide range of information including adaptation case studies, potential adaptation measures and tools that support adaptation planning.

We wish with this letter to signal our commitment to become a member of the advisory board of the VISCA project. Our involvement will entail:

- Participation in annual meetings of VISCA aimed at disseminating outcomes of the project and obtaining feedback from interested stakeholders.
- Definition of existing barriers to deploy climate tools in sectors relevant for rural areas.
- Addressing the replicability opportunities of the tool in sectors relevant for rural areas.

It is understood that reasonable expenses for our participation will be covered by the VISCA project.

I hereby confirm that the EEA fully supports the submission of the VISCA proposal by project leader Dr. Maria Navarro and is willing to participate in this project as member of the advisory board.

Wishing you success with VISCA,

Dr. Annemarie Bastrup-Birk  
Project manager, Land systems

European Environment Agency



Kongens Nytorv 6  
1050 Copenhagen K  
Denmark

Tel.: +45 3336 7100  
Fax: +45 3336 7199

Email: [eea@eea.europa.eu](mailto:eea@eea.europa.eu)  
Web: [www.eea.europa.eu](http://www.eea.europa.eu)





EUROPEAN COMMISSION  
DIRECTORATE-GENERAL  
JOINT RESEARCH CENTRE  
Directorate D – Sustainable Resources  
Director

Ref. Ares(2016)4804094 - 26/08/2016

Ispra,  
D00- /DW/jrc.d.dir(2016)

D5/2016/21831  
Proposal Coordinator  
Dr. Maria Navarro  
METEOSIM S.L  
C/ Baldiri I Reixac 10 – 12  
08028 Barcelona  
SPAIN

**Subject: Letter of commitment to the VISCA proposal as member of the Advisory Board**

Dear Dr. Navarro,

It is with great interest that we have taken notice of the H2020 *Climate Action* proposal VISCA “Vineyards’ Integrated Smart Climate Application” under the call SC5-01-2016, whose topic directly relates to the activities of the Food Security Unit of the Joint Research Centre, European Commission, in general, and to the crop monitoring and yield forecasting activities of the AGRI4CAST project within the unit in particular. We believe that the project coordination and the consortium have acknowledged expertise, which will allow them to successfully reach the project objectives towards the integration of a tool capable to supply wine companies with well-sustained climatic and phenological data, essential for crop planning at medium and long term. We likewise foresee the enormous interest of such a tool to empower many other agricultural sectors towards adaptation to climate change.

The Food Security Unit of the JRC provides – among other services – near real-time crop growth monitoring and yield forecasting information for the EU and its wider neighbourhood. It also assesses climate change impacts on agriculture through the simulation of impacts of climate change scenarios in crop models. Moreover, it provides scientific advice and early warning on agricultural production in food-insecure regions of the world.

We wish with this letter to signal our commitment to become a member of the advisory board of the VISCA project. Our involvement will entail:

- Participation in annual meetings of VISCA aimed at disseminating outcomes of the project and obtaining feedback from interested stakeholders.

European Commission, Via Enrico Fermi 2749, I-21027 Ispra (Varese) - Italy. Telephone: (39)0332-78-9307.  
Office: 100 2303. Telephone: direct line (39)0332-78-6541. Fax: (39)0332-78-9222.

E-mail: David.WILKINSON@ec.europa.eu

- Definition of existing barriers to deploy climate tools in the field of forecasting agricultural production at national and continental scales.
- Addressing replicability opportunities of the tool in related domains and for additional crops.

It is understood that reasonable expenses for our participation will be covered by the VISCA project.

I hereby confirm that the Food Security Unit of the JRC fully supports the submission of the VISCA proposal by project leader Dr. Maria Navarro and is willing to participate in this project as member of the advisory board. The contact point in my unit for your project will be Mr Stefan Niemeyer ([stefan.niemeyer@jrc.ec.europa.eu](mailto:stefan.niemeyer@jrc.ec.europa.eu)).

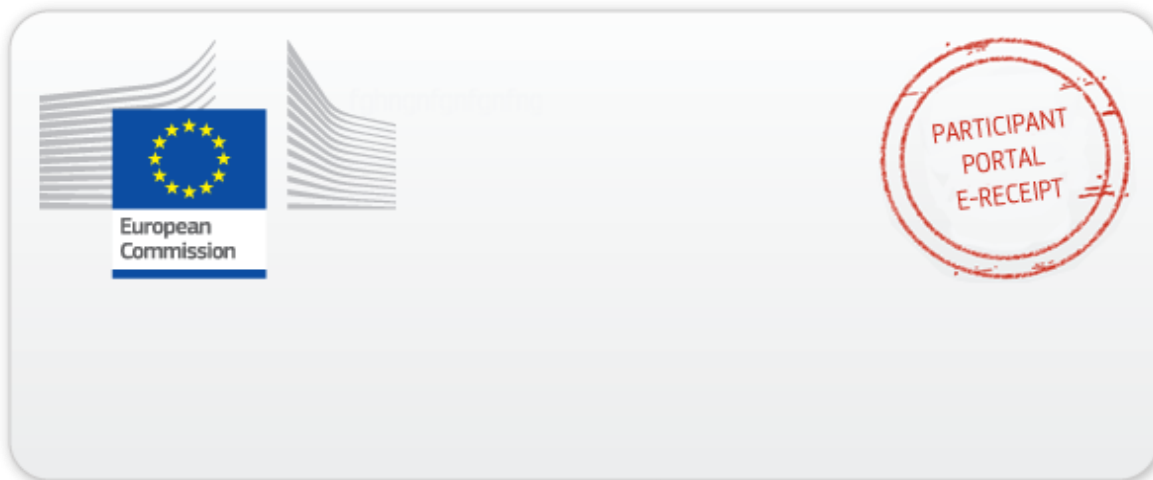
Wishing you success with VISCA.



pp.

With kind regards,

David Wilkinson



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