Facing the Challenge

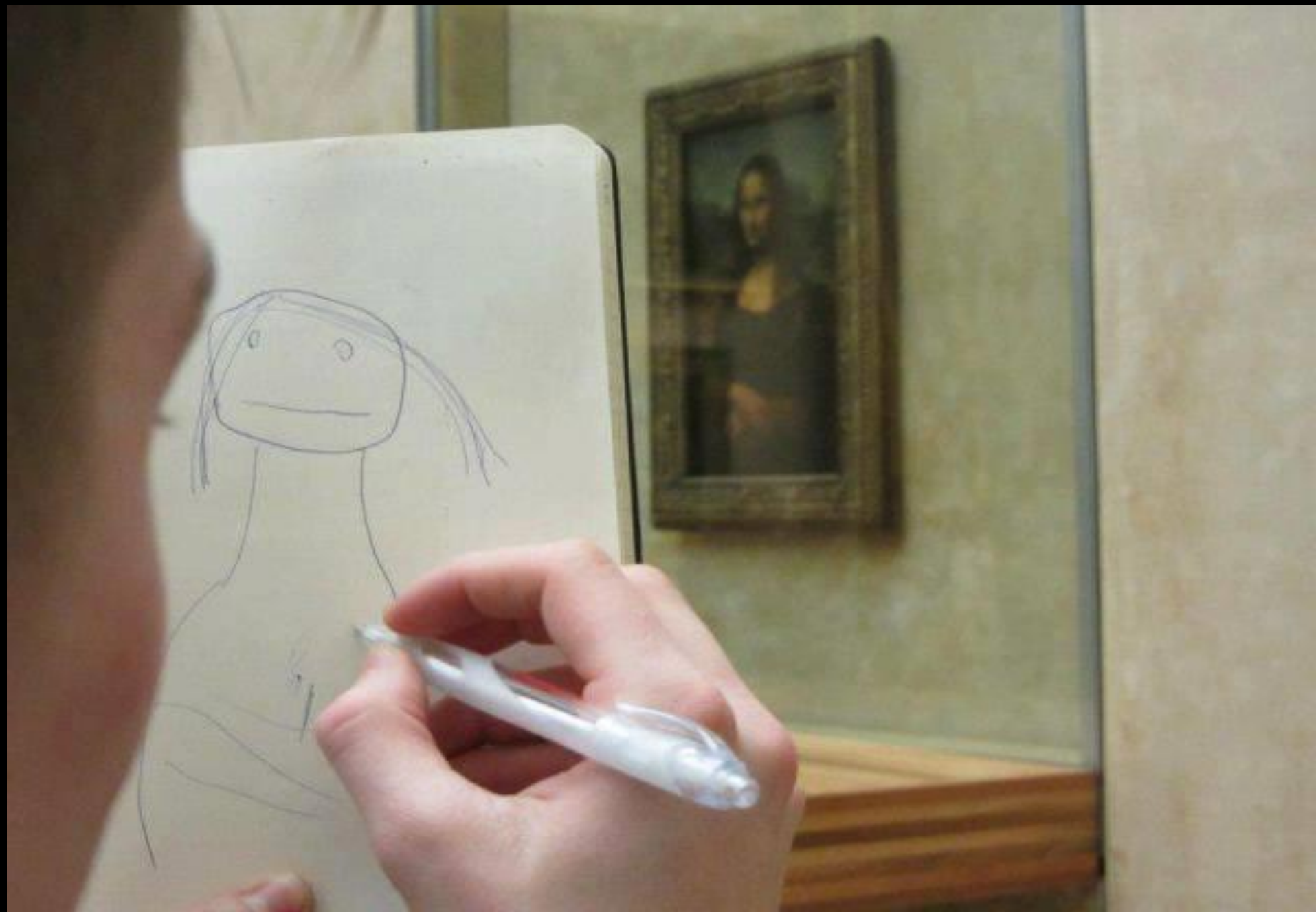
Facing The Challenge: How Esporão is Adapting in a Turbulent World

Nuno Gaspar de Oliveira

Ecosystem Manager

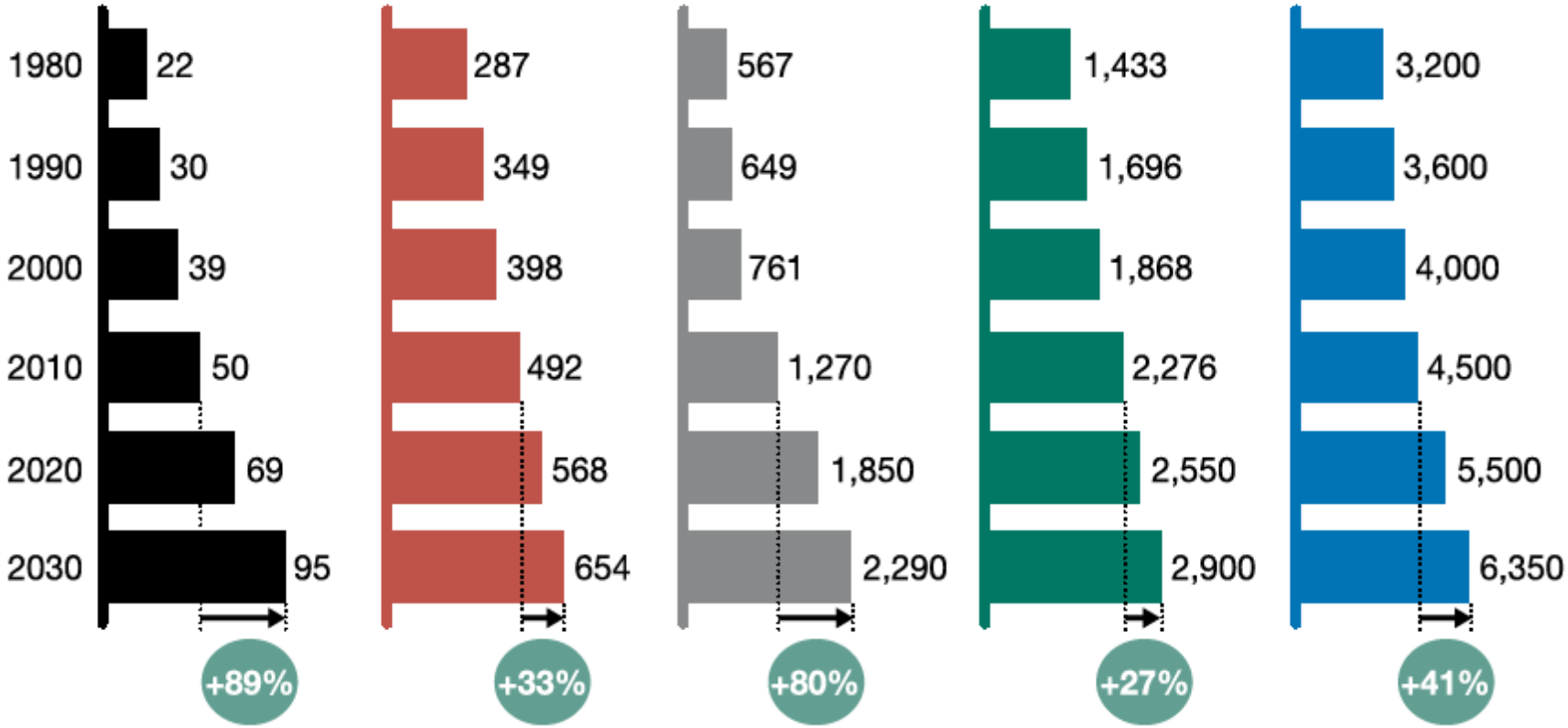
Esporão SA

A problem of perception?



A problem of planning?

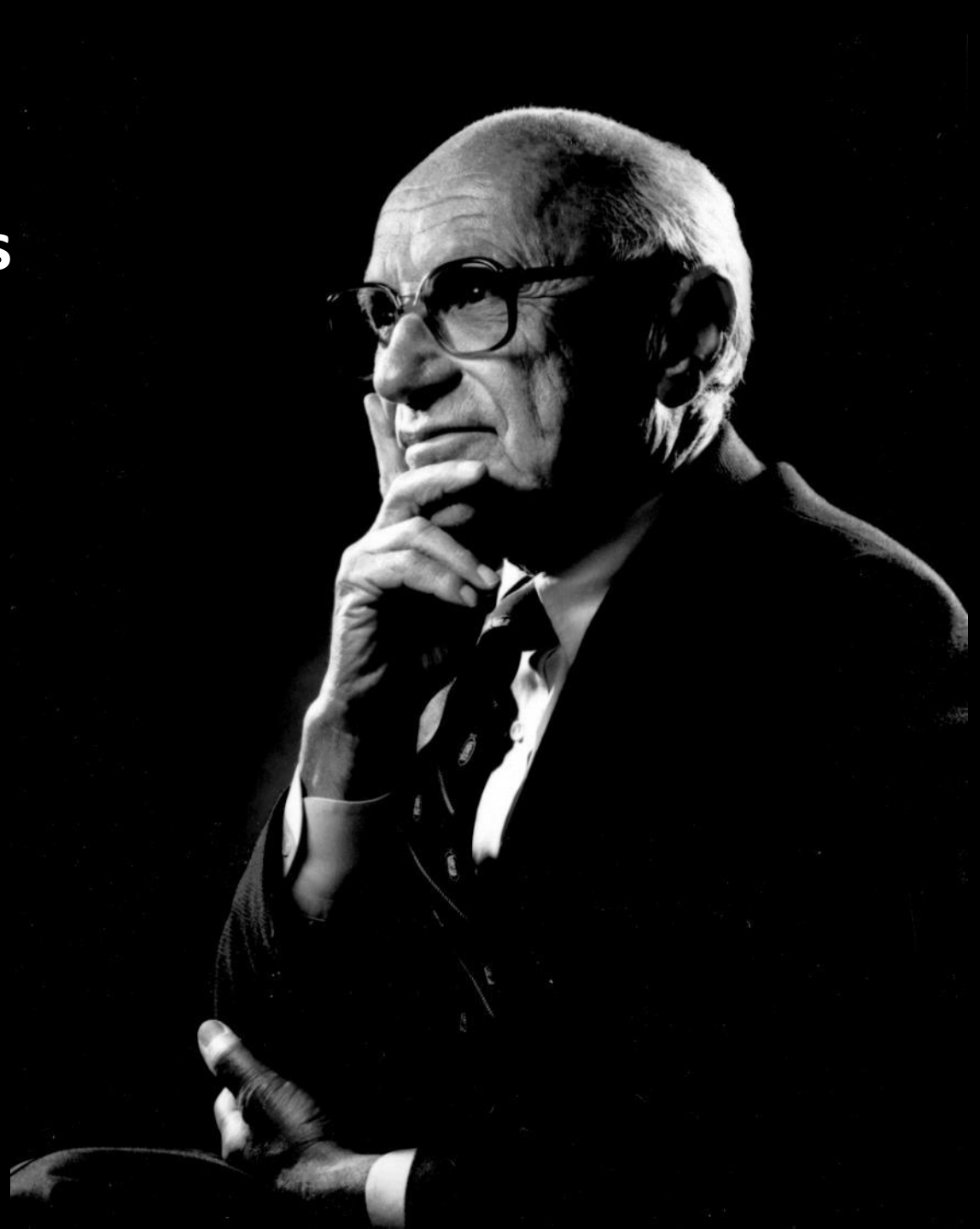
Figure 1. Historical and estimated growth in demand for resources from 1980 to 2030.



SOURCE: McKinsey & Co Global Institute (2011). Resource Revolution: Meeting the world's energy, materials, food, and water needs, p. 35. New York. Available at: http://www.mckinsey.com/Features/Resource_revolution.

The Social Responsibility of Business is to Increase its Profits

Milton Friedman in *The New York Times Magazine*
(13 September 1970)



WORLD ECONOMIC FORUM

COMMITTED TO IMPROVING THE STATE OF THE WORLD

Insight Report

The Global Risks Report 2019
14th Edition

In partnership with Marsh & McLennan Companies and Zurich Insurance Group

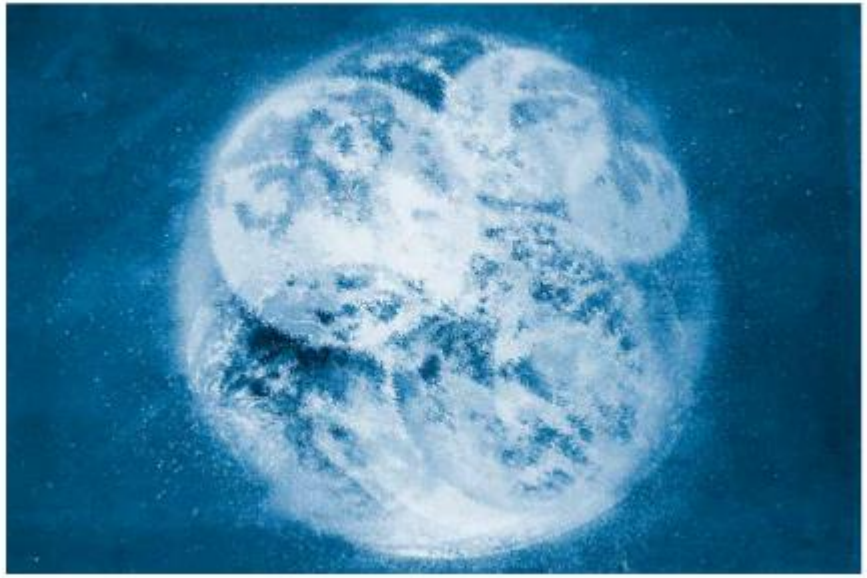
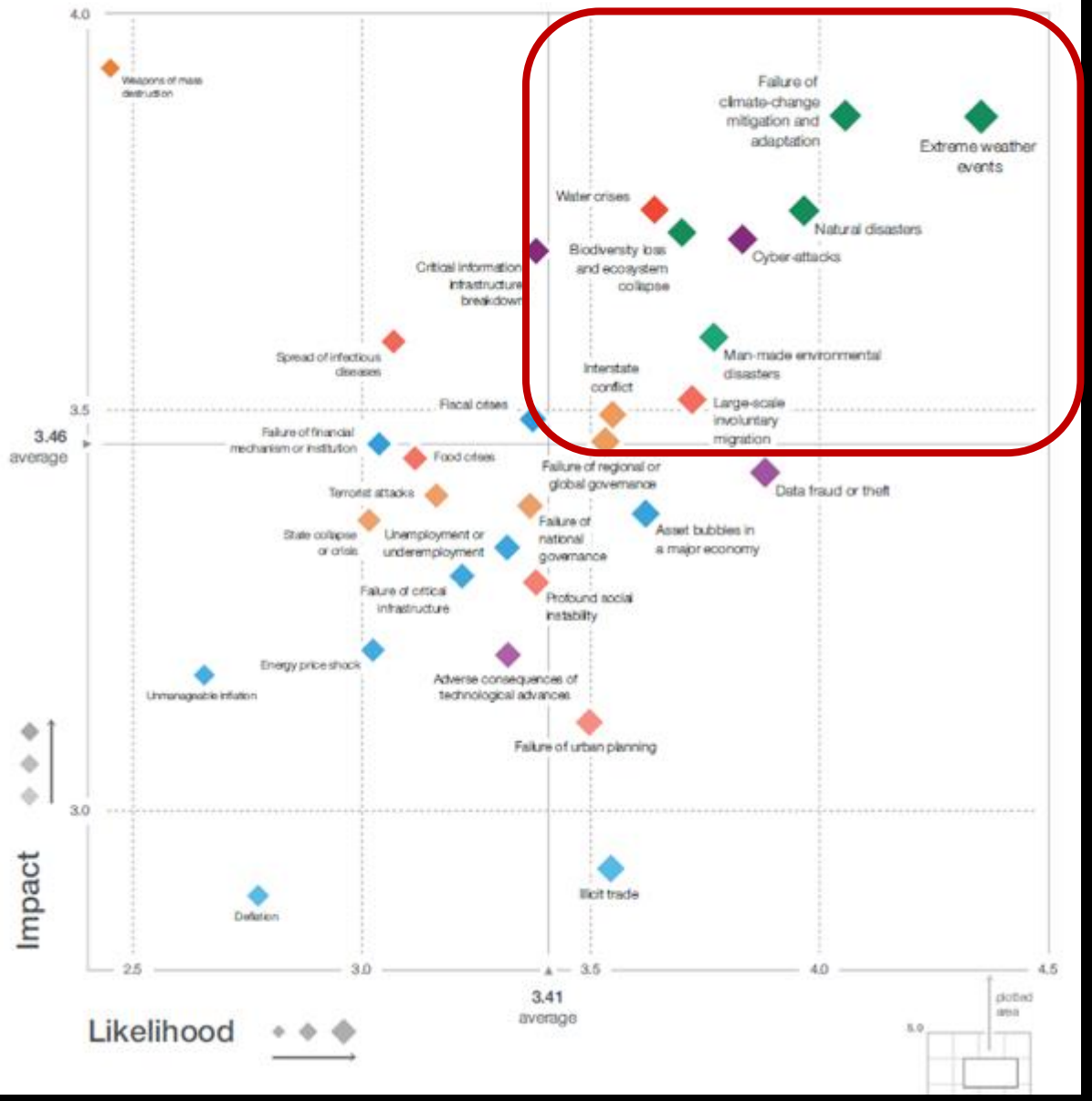
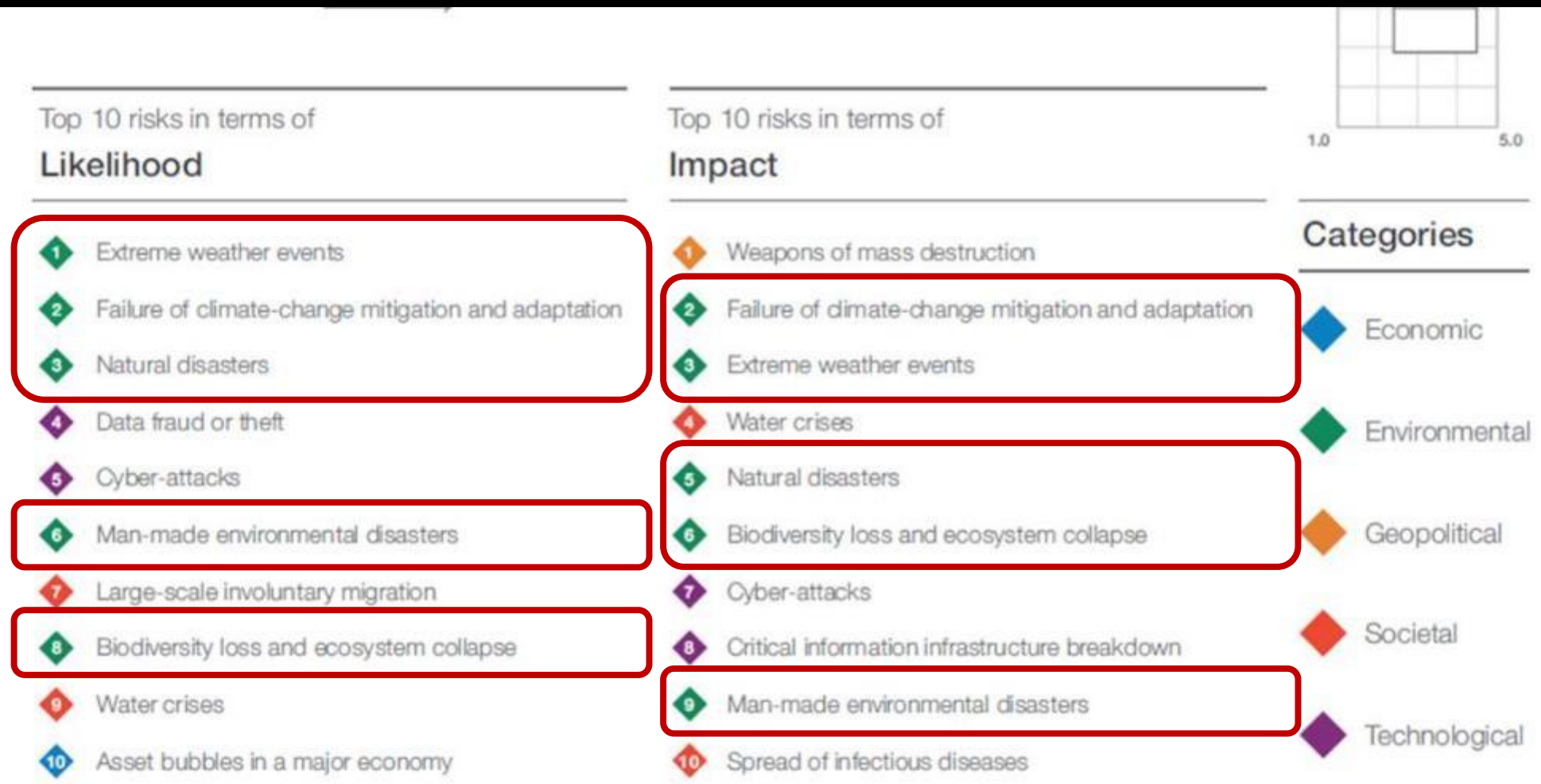


Figure I: The Global Risks Landscape 2019





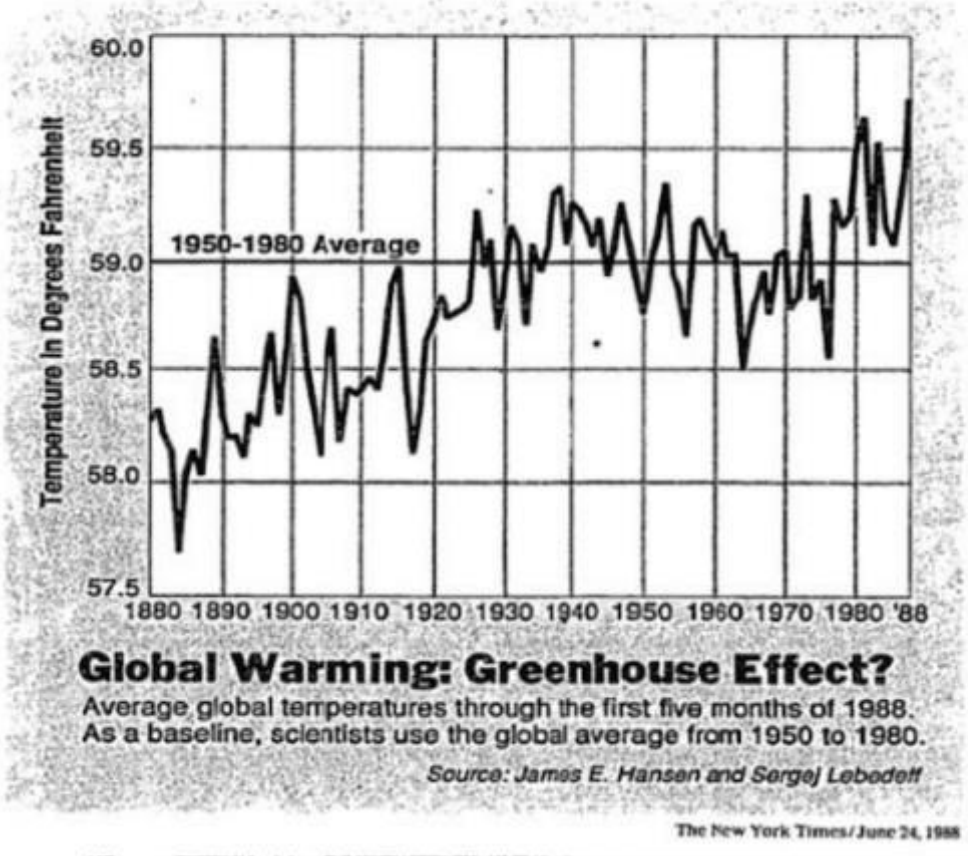
Source: World Economic Forum Global Risks Perception Survey 2018–2019.

"All the News That's Fit to Print"

The New York Times

VOL.CXXXVII . . . No. 47,546 NEW YORK, FRIDAY, JUNE 24 1988

Global Warming Has Begun, Expert Tells Senate



Global Warming: Greenhouse Effect?

Average global temperatures through the first five months of 1988. As a baseline, scientists use the global average from 1950 to 1980.

Source: James E. Hansen and Sergej Lebedeff

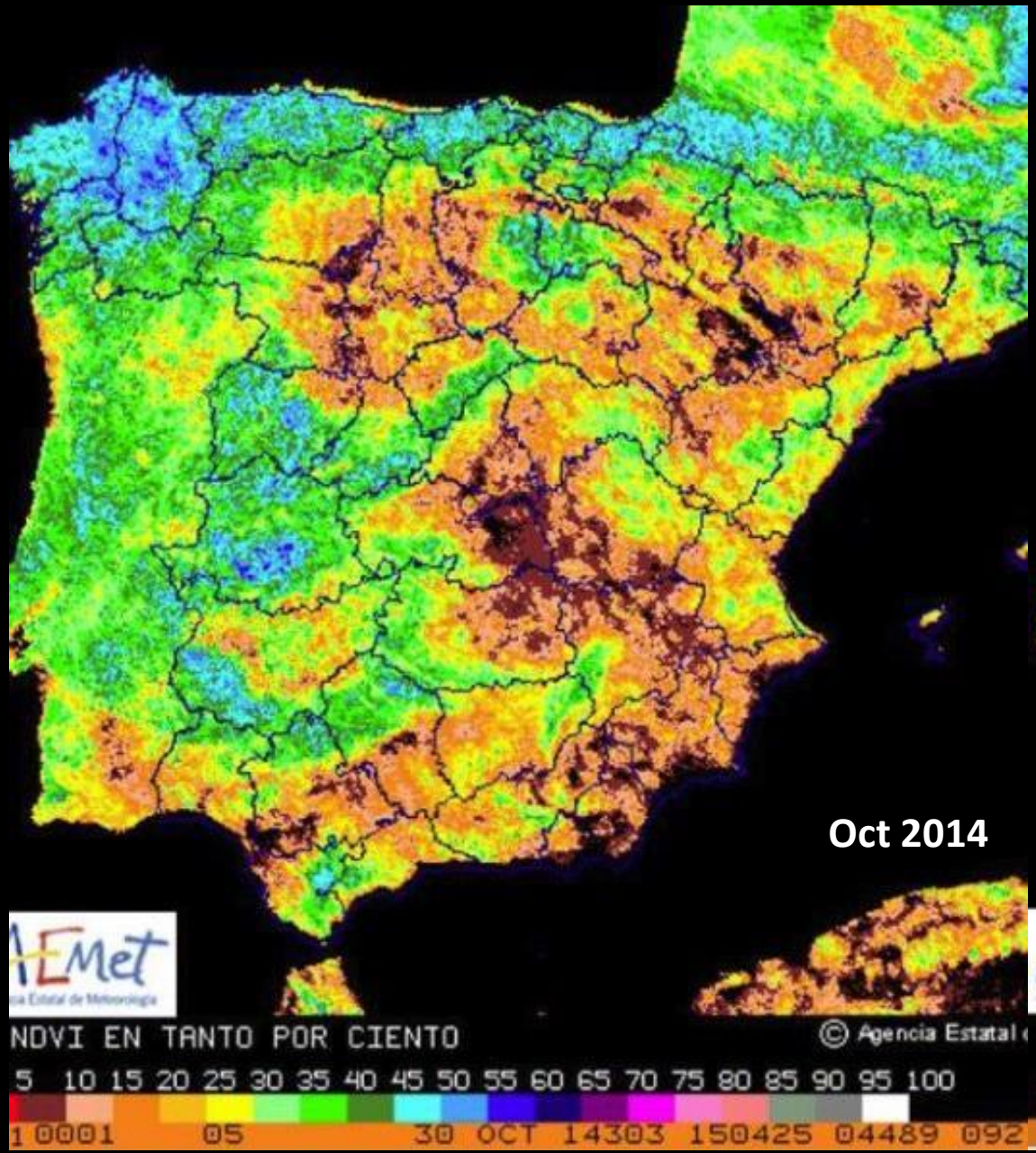
The New York Times/June 24, 1988

Sharp Cut in Burning of Fossil Fuels Is Urged to Battle Shift in Climate

By PHILIP SHABECOFF
Special to The New York Times

WASHINGTON, June 23 — The earth has been warmer in the first five months of this year than in any comparable period since measurements began 130 years ago, and the higher temperatures can now be attributed to a long-expected global warming trend linked to pollution, a space agency scientist reported today.

Until now, scientists have been cautious about attributing rising global temperatures of recent years to the predicted global warming caused by pollutants in the atmosphere, known as the "greenhouse effect." But today Dr. James E. Hansen of the National Aeronautics and Space Administration told a Congressional committee that it was 99 percent certain that the warming trend was not a natural variation but was caused by a buildup of carbon dioxide and other artificial gases in the


Oct 2014
AEMet
NDVI EN TANTO POR CIENTO
© Agencia Estatal
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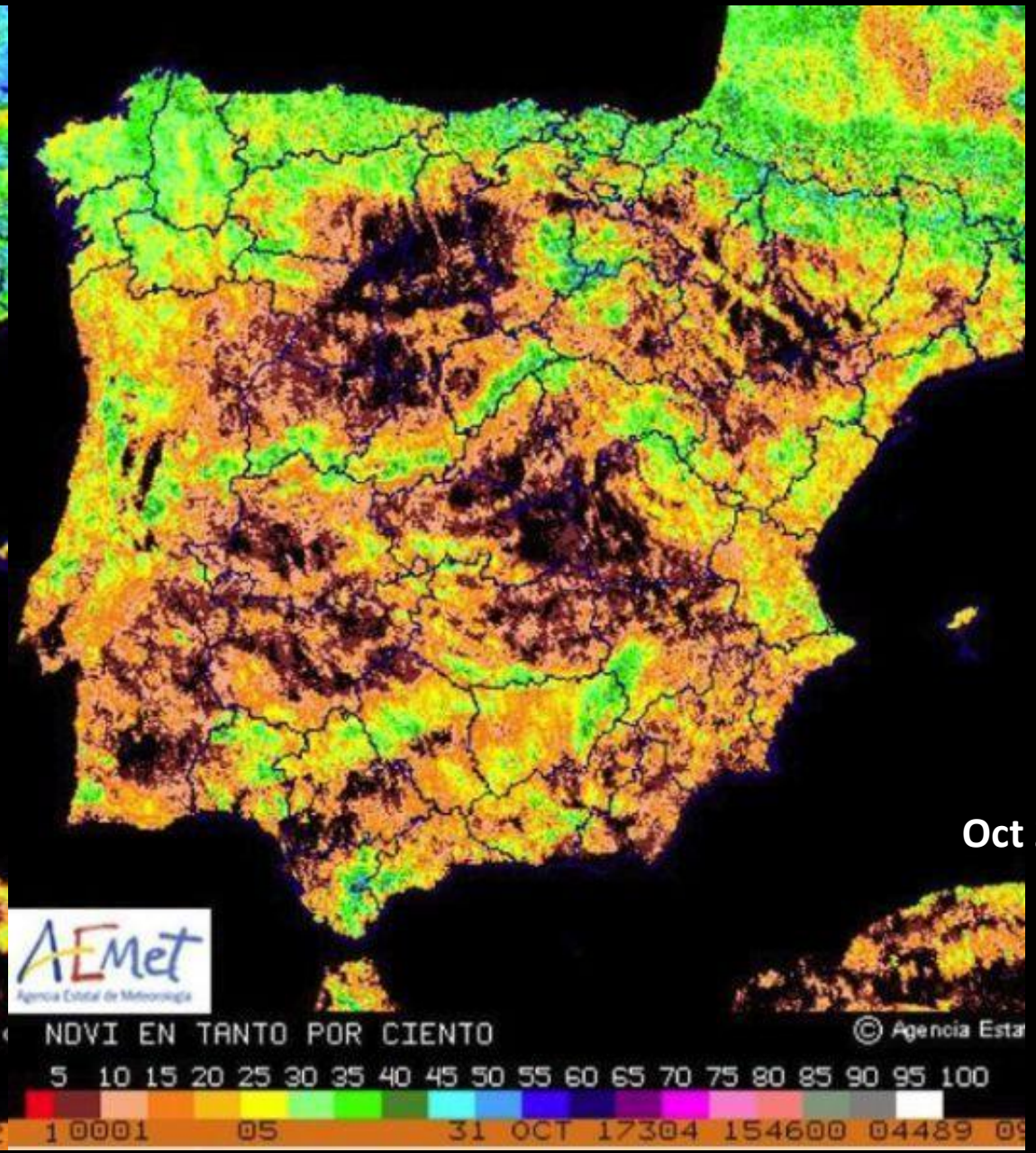
1 0001 05 30 OCT 14303 150425 04489 092


Oct 2017
AEMet
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© Agencia Estat
5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100
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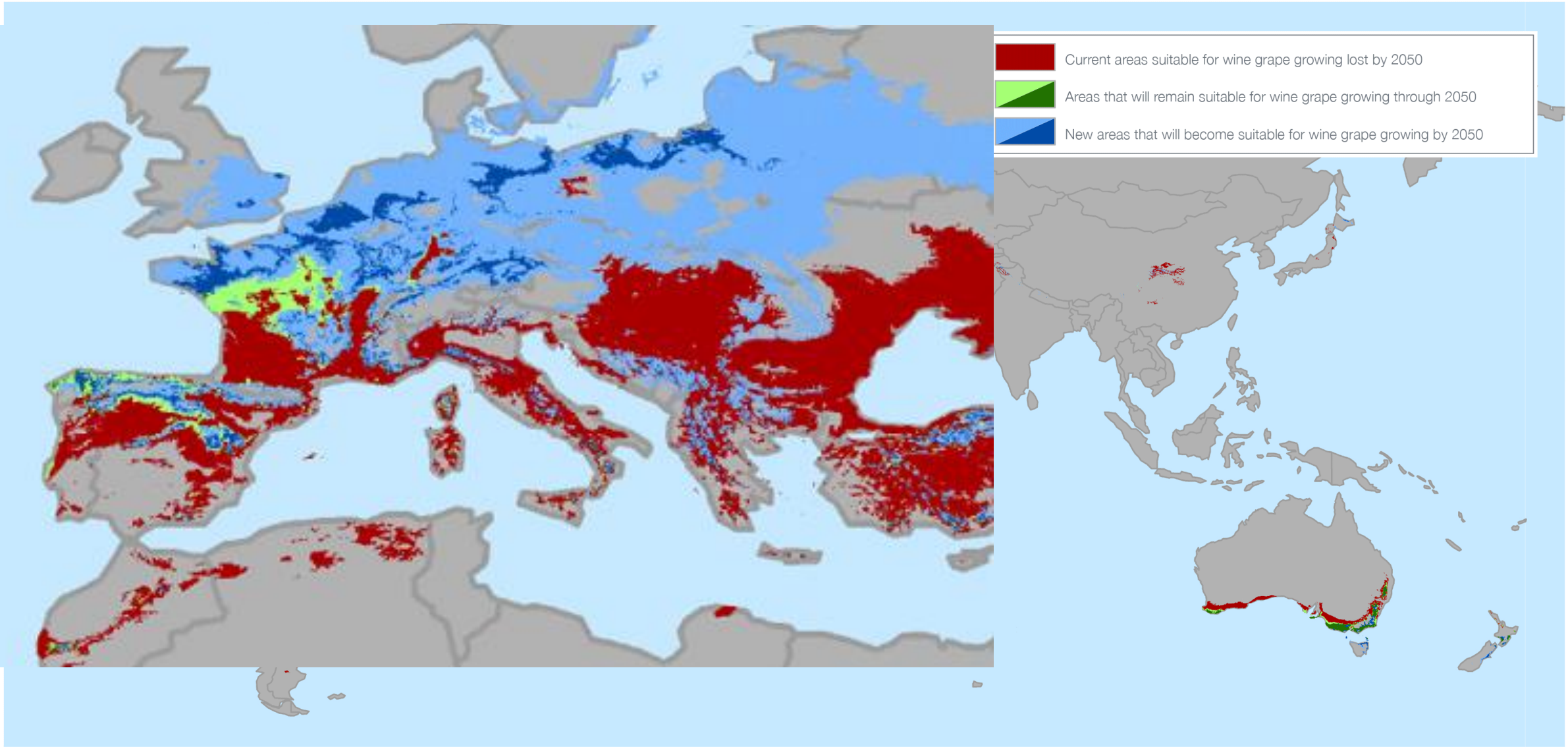
GLOBAL CHANGE IN AREAS SUITABLE FOR GROWING WINE GRAPES THROUGH 2050



Mar 29, 2016 | Posted by Toby Webb in Agriculture, Circular Economy, Climate Change, Sustainable wine | Comments Offon Sustainable wine podcasts and posts: The limits to organics and what is “conflict wine”?

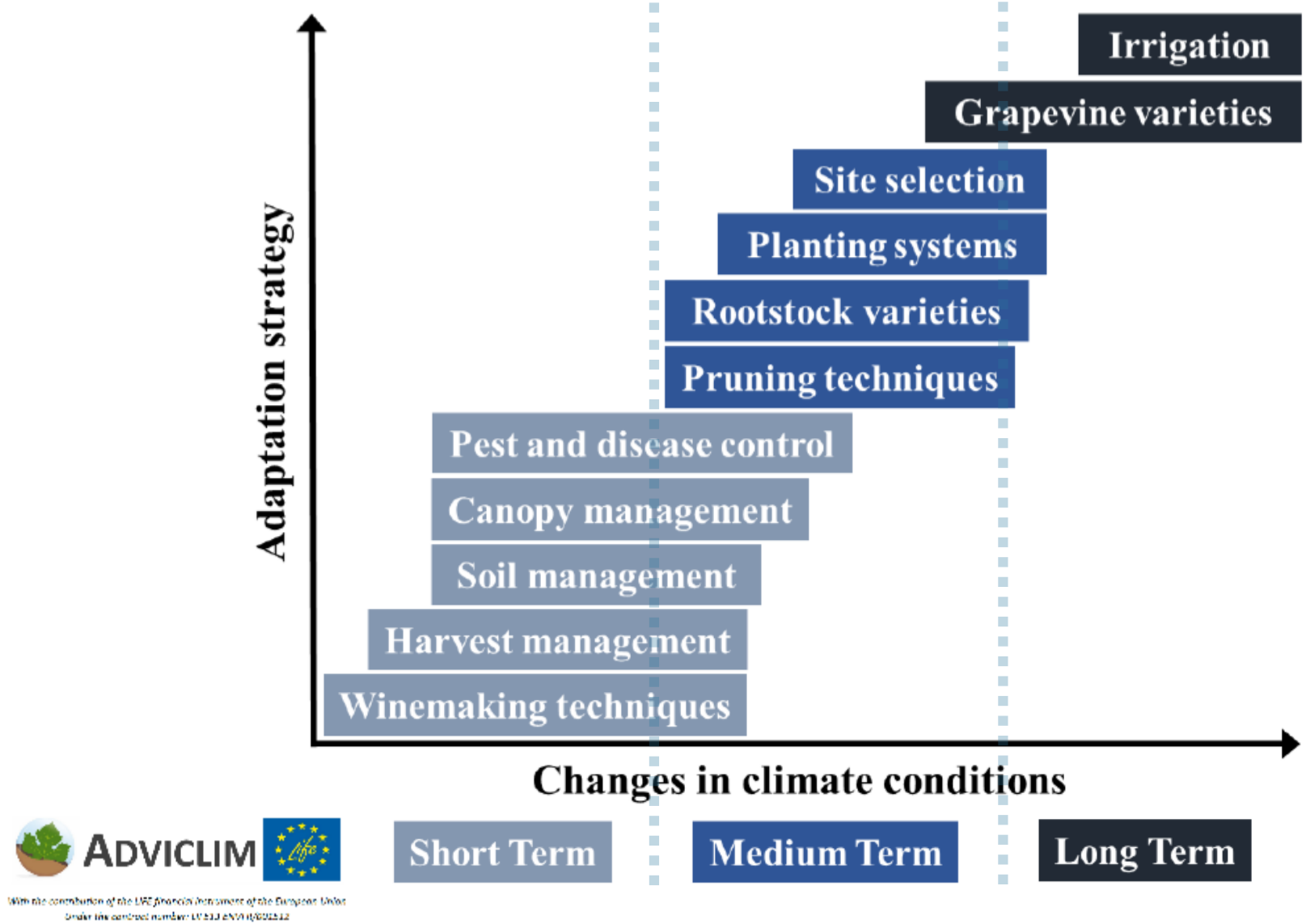
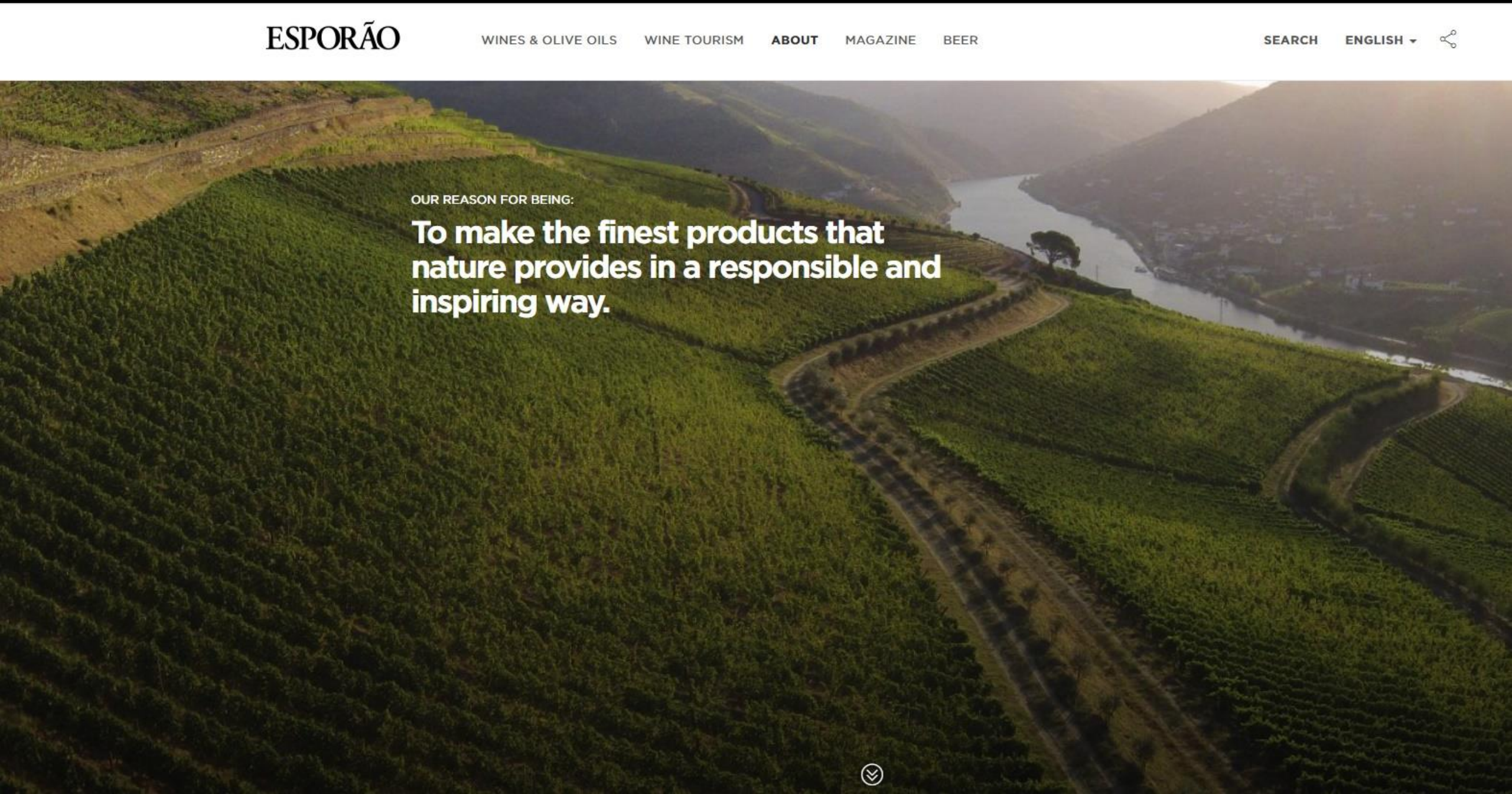


Figure 7: Representation of different adaptation strategies to changes in climate conditions over the short, medium and long term.


ESPORÃO
WINES & OLIVE OILS
WINE TOURISM
ABOUT
MAGAZINE
BEER
SEARCH
ENGLISH
OUR REASON FOR BEING:
To make the finest products that nature provides in a responsible and inspiring way.

2008
START OF ORGANIC PRODUCTION

2016
100% HERDADE DO ESPORÃO + QUINTA DOS MURÇAS USES ORGANIC PRODUCTION METHODS

2017

2021
ALL ESPORÃO'S AGRICULTURAL AREA CERTIFIED AS ORGANIC PRODUCTION

769 ha
AGRICULTURAL AREA

643 ha
ORGANIC PRODUCTION
84%/540 HA VINEYARD + 16%/103 HA OLIVE GROVE

100% HERDADE DO ESPORÃO
100% QUINTA DOS MURÇAS

84%

180 ha
CERTIFIED IN 2017
(REMAINING AREA UNDERGOING CERTIFICATION)
45% VINEYARD + 53% OLIVE GROVE + 2% ORANGE GROVE

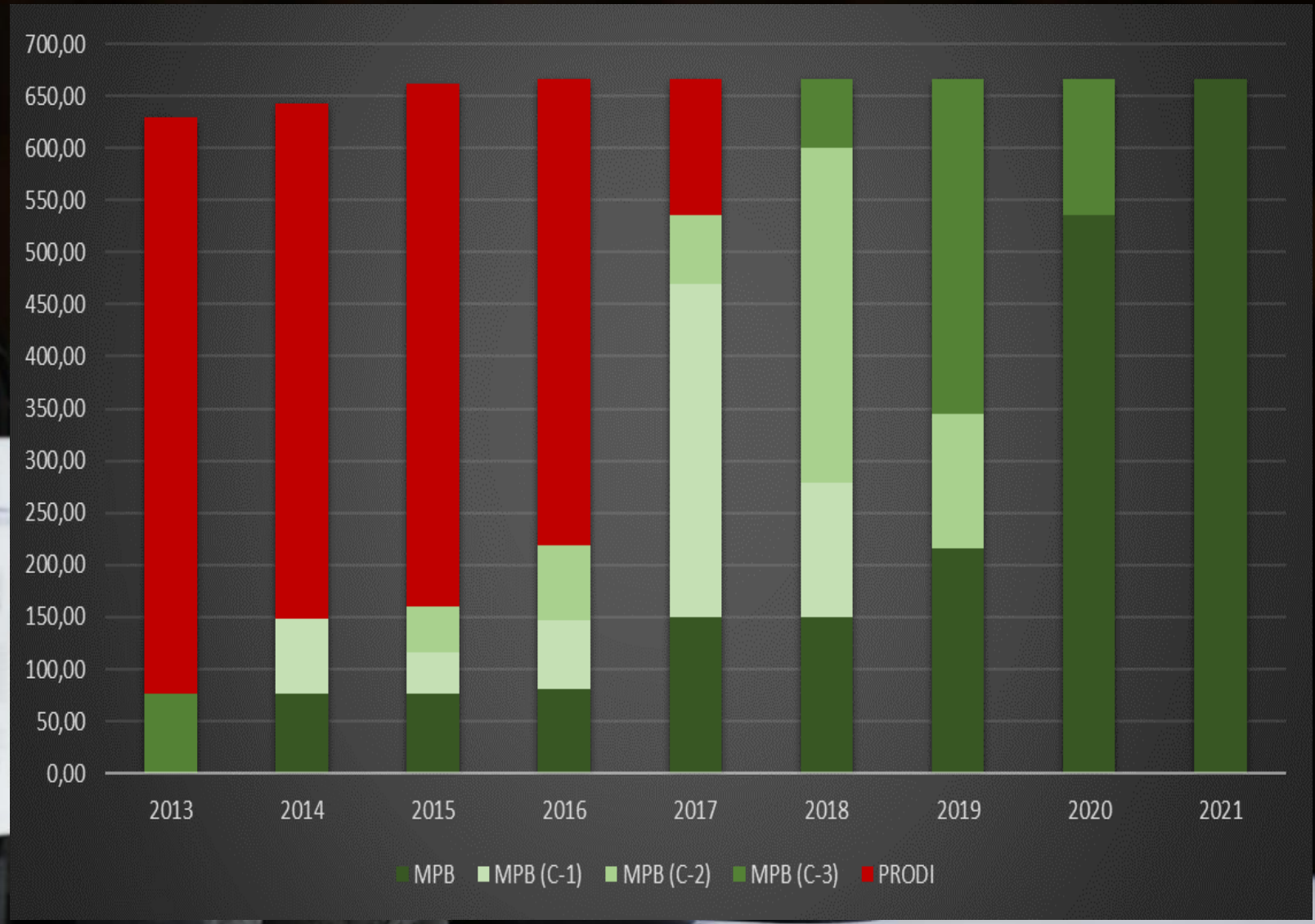
28%

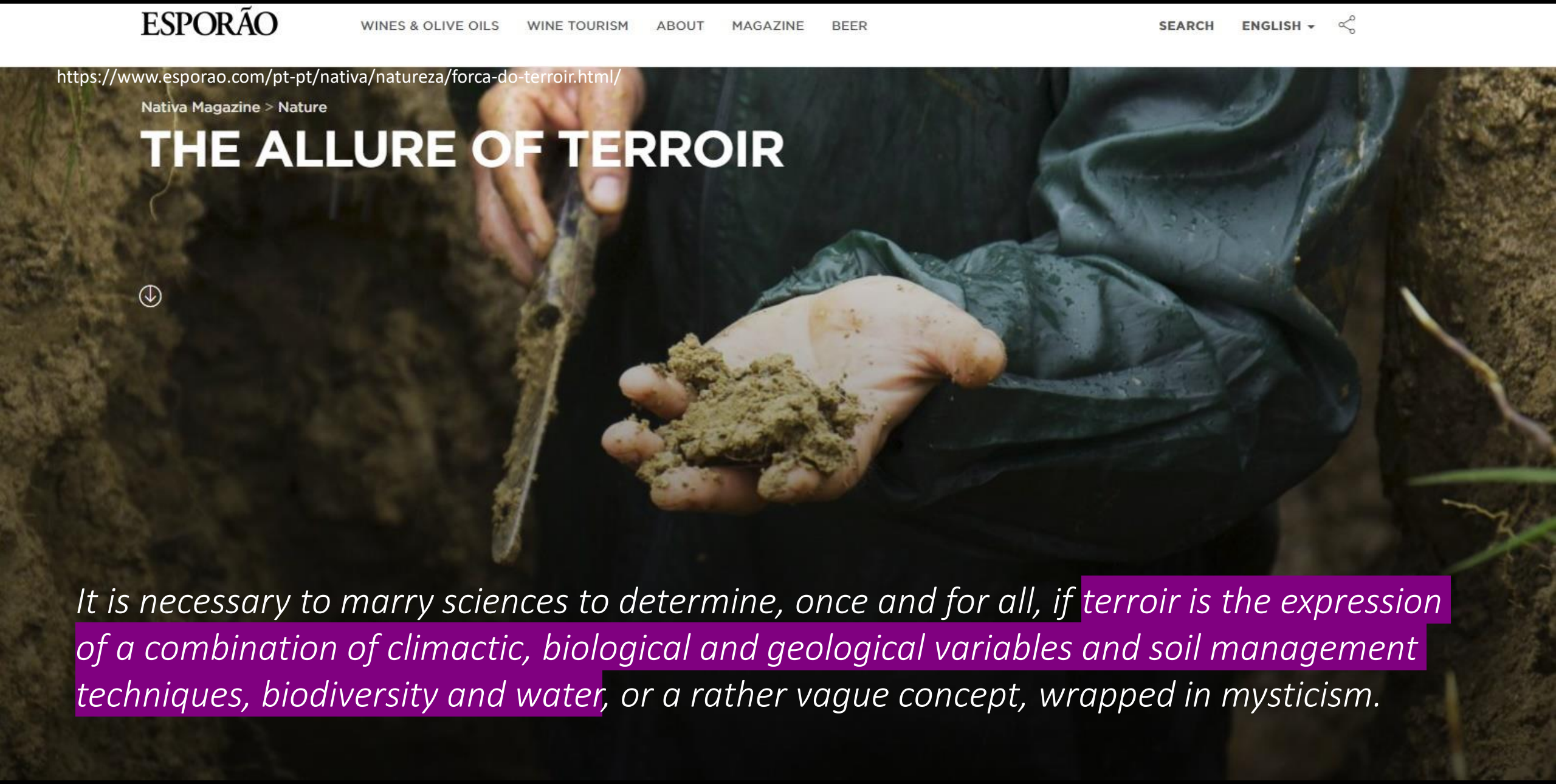
WHY ORGANIC?
FOR PRODUCT QUALITY, ENVIRONMENTAL PRESERVATION AND PEOPLE'S HEALTH.

"TO MAKE THE FINEST PRODUCTS THAT NATURE PROVIDES, IN A RESPONSIBLE AND INSPIRING WAY."

Why Organic Farming?

- Increasing soil fertility;
- Close loops by using by-products generated by our activity - Circular Economy;
- Water efficiency / quality;
- Biocontrol and managing Pest /& Beneficial organisms - Functional Biodiversity;
- Install ecological infrastructures to support native fauna and flora - Ecosystem Management;
- Produce grapes / olive of superior quality and residue free




ESPORÃO
WINES & OLIVE OILS
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ABOUT
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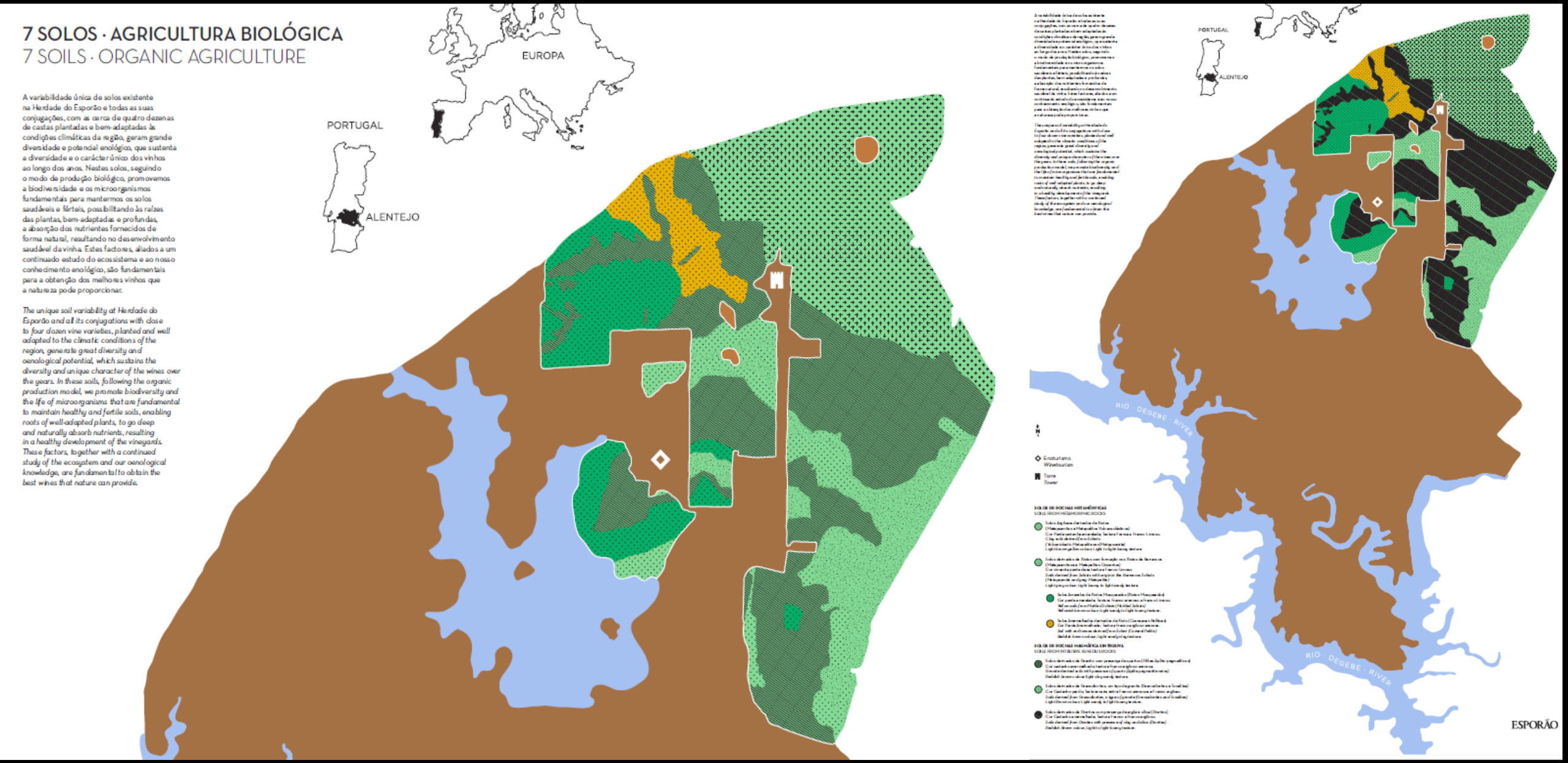
SEARCH
ENGLISH
https://www.esporao.com/pt-pt/nativa/natureza/forca-do-terroir.html/
Nativa Magazine > Nature
THE ALLURE OF TERROIR
It is necessary to marry sciences to determine, once and for all, if terroir is the expression of a combination of climactic, biological and geological variables and soil management techniques, biodiversity and water, or a rather vague concept, wrapped in mysticism.

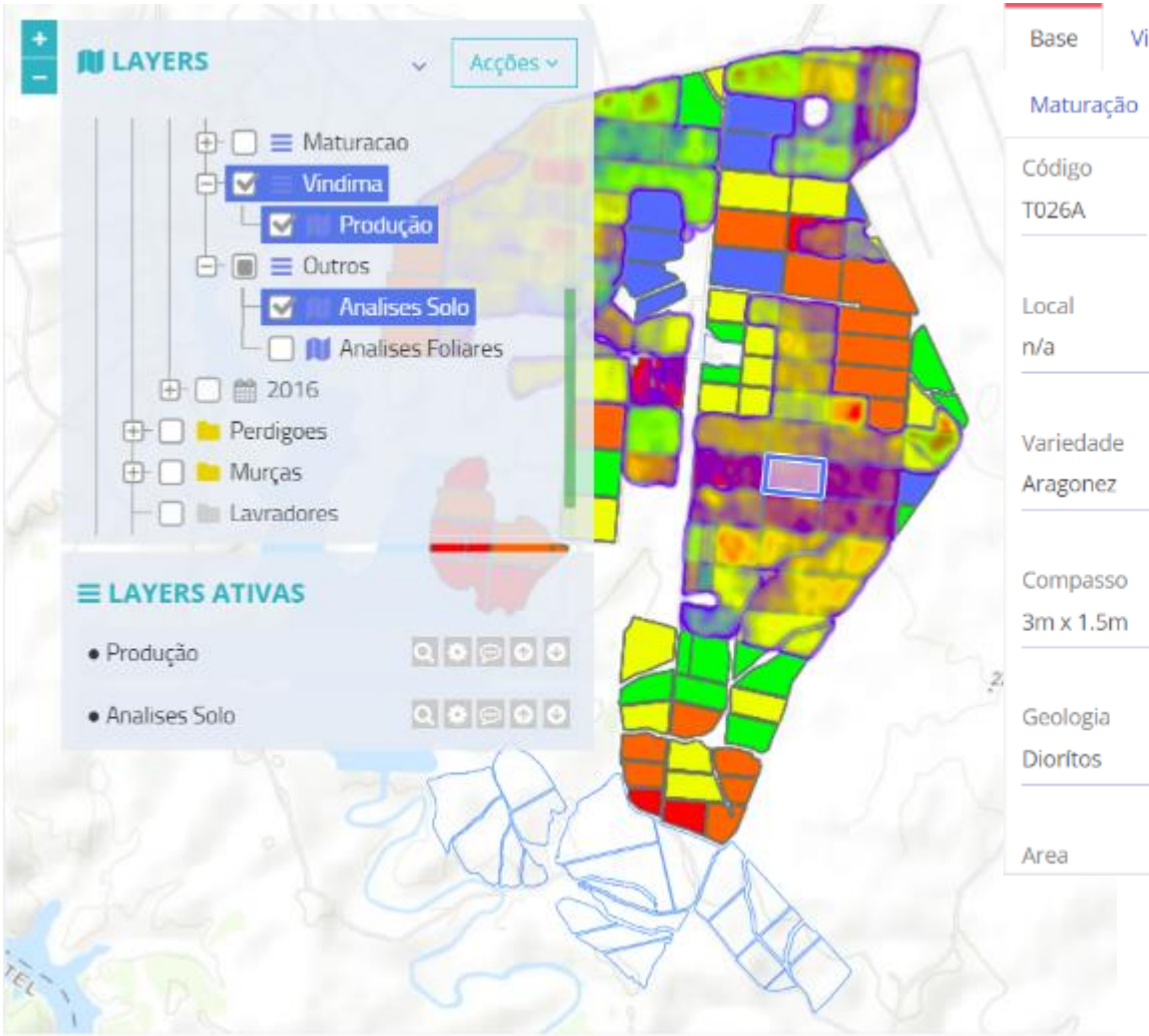
7 SOLOS · AGRICULTURA BIOLÓGICA
7 SOILS · ORGANIC AGRICULTURE

A variabilidade única de solos existente na Herdade do Esporão e todas as suas conjugações, com as cerca de quatro dezenas de castas plantadas e bem-adaptadas às condições climáticas da região, geram grande diversidade e potencial enológico, que sustenta a diversidade e o carácter único dos vinhos ao longo dos anos. Nestes solos, seguindo o modo de produção biológico, promovemos a biodiversidade e os microorganismos fundamentais para mantermos os solos saudáveis e férteis, possibilitando às raízes das plantas, bem-adaptadas e profundas, a absorção dos nutrientes fornecidos de forma natural, resultando no desenvolvimento saudável da vinha. Estes factores, aliados a um continuado estudo do ecossistema e ao nosso conhecimento enológico, são fundamentais para a obtenção dos melhores vinhos que a natureza pode proporcionar.

The unique soil variability at Herdade do Esporão and all its conjugations with close to four dozen vine varieties, planted and well adapted to the climatic conditions of the region, generate great diversity and oenological potential, which sustains the diversity and unique character of the wines over the years. In these soils, following the organic production model, we promote biodiversity and the life of microorganisms that are fundamental to maintain healthy and fertile soils, enabling roots of well-adapted plants, to go deep and naturally absorb nutrients, resulting in a healthy development of the vineyards. These factors, together with a continued study of the ecosystem and our oenological knowledge, are fundamental to obtain the best wines that nature can provide.



AgroSIG Esporão



Base Vindima Analises

Maturação

Código	Cultura	Herdade
T026A	Vinha	Esporão

Local: n/a

Variedade	Cor
Aragonez	T

Compasso	AnoPlantacao
3m x 1.5m	1996

Geologia	Potencial
Dioritos	Mono / Esporão

Area	NumPlantas	NumLinhas

Base Vindima Analises

Maturação

	Data	Elemento	Valor	Uni.
	201	Fósforo	8	mg
	201	Potássio	194	mg
	201	Magnésio	721	Mg
	201	Boro	0.29	mg/
	201	Ph	6.1	
	201	Azoto	4.1	g/Kg
	201	Fósforo	4.2	g/Kg
	201	Potássio	26.6	g/Kg
	201	Cálcio	3.5	g/Kg
	201	Magnésio	3.8	g/Kg
	201	Enxofre	1.4	g/Kg
	201	Boro	77	mg/
	201	Ferro	32	mg/

Base Vindima Analises

Maturação

Ano	Prod.	Prod/Ha
2017	13 630 ↑	3 461 ↑
2016	10 520 ↓	2 671 ↓
2015	15 860 ↑	4 027 ↑
2014	10 270 ↓	2 608 ↓
2013	11 080 ↑	2 814 ↑
2012	8 140 ↓	2 067 ↓

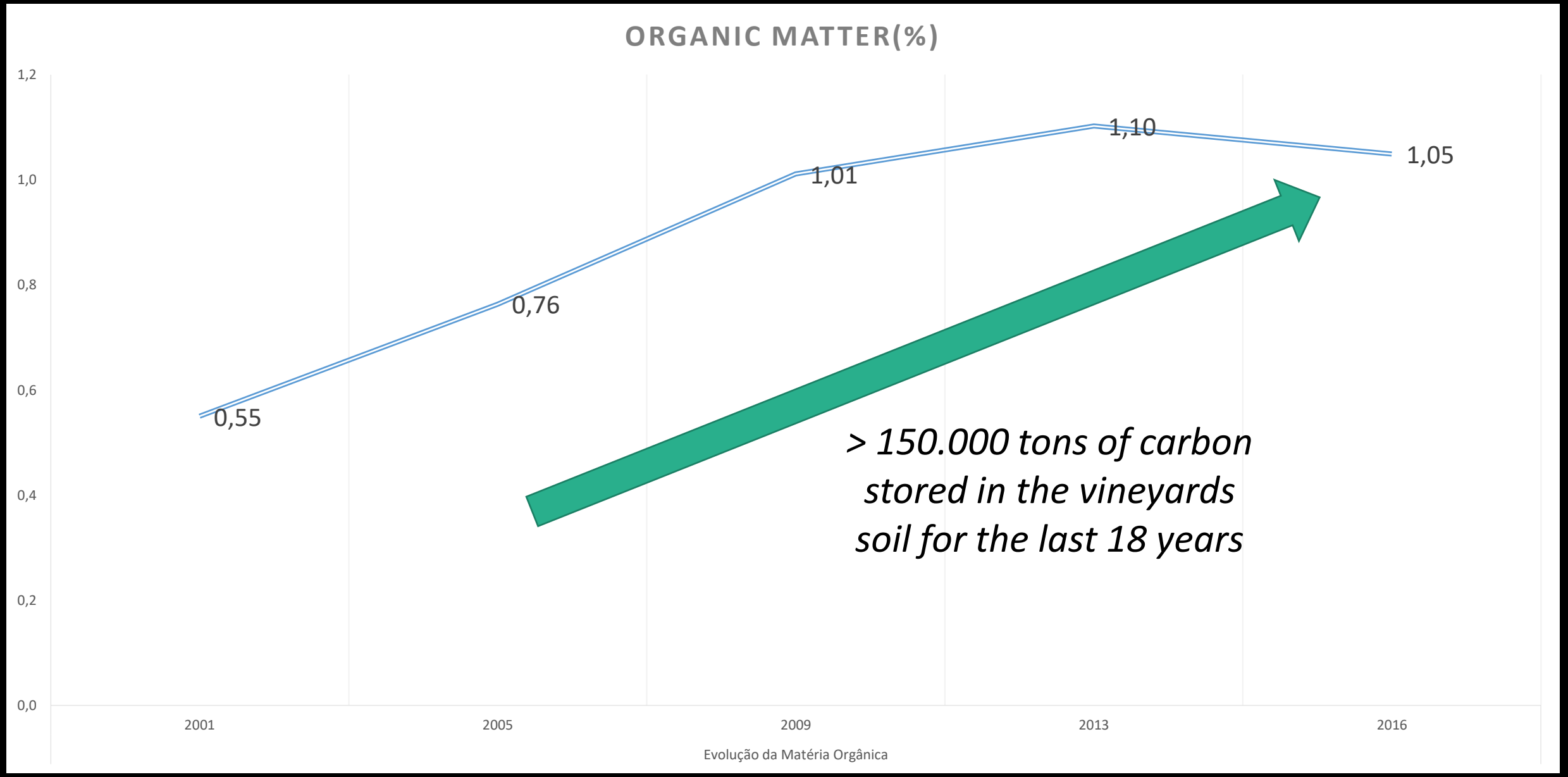
Yellow lupine
(Tremocilha)

Natural vegetation
(Vegetação espontânea)

Fava beans
(Favas)

Nectar Rich Mix
(Mix Melíferas)

Composting / Mulching


ORGANIC MATTER(%)
1,2
1,0
0,8
0,6
0,4
0,2
0,0
0,55
0,76
1,01
1,10
1,05
2001
2005
2009
2013
2016
Evolução da Matéria Orgânica
> 150.000 tons of carbon stored in the vineyards soil for the last 18 years


> 20 bat houses holding up to 500 bats that feed mainly in vineyard and olive grove pests

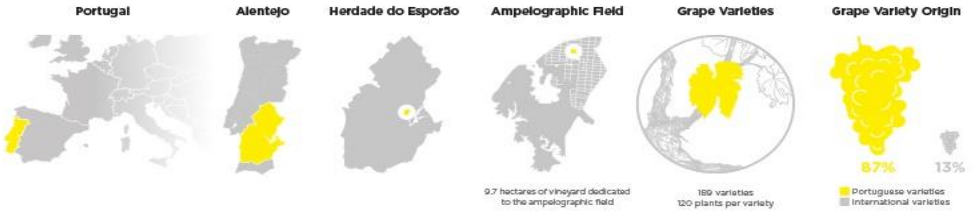

> 15 km of streamline galleries recovered and undergoing ecological restoration


> 150 hectares of protected wetland ecosystems nearby the vineyards

The sustainable management of soils and water in the vineyards and olive groves facilitates the conservation of > 600 hectares of biodiversity rich semi-natural ecosystems with > 400 species of flora

AMPELOGRAPHIC FIELD

11 hectares, 189 grape varieties



What is it?

An experimental field covering 9.7 hectares, set-up at Esporão in 2011 and planted with 189 grape varieties (Vitis vinifera L.). The field boasts every variety of the Alentejo region, all the varieties of the Douro region, the main varieties of all of Portugal's winegrowing regions, other Portuguese varieties that are rarely used but with winegrowing potential, and international varieties with potential for this part of the Alentejo.

Why an ampelographic field at Esporão?

1. To be better prepared for climate change: a study that focusses on 50 years of weather data for 27 wine-producing regions suggests that the impact of global warming may have major effects on wine quality in the near future.

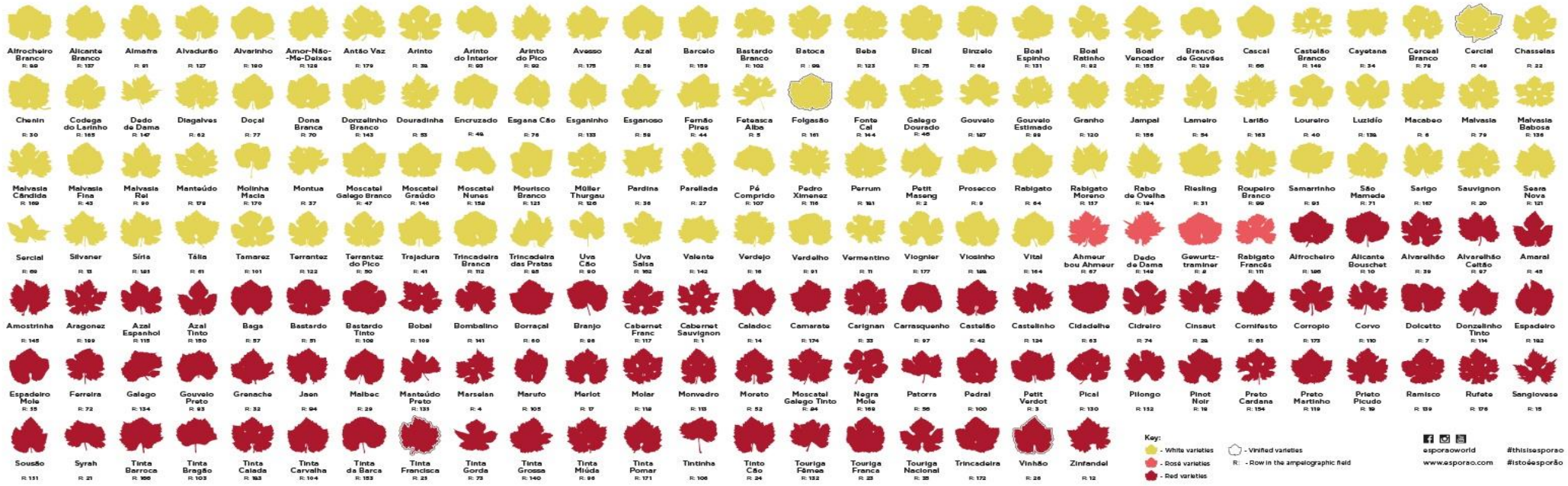
2. To contribute to increasing our organic production and the longevity of our vineyards and business: we believe that only by respecting the balance of ecosystems will our viticulture with a future; to preserve varieties that now only exist in collections and are at risk of extinction.

What do we want?

1. To assess the winegrowing potential of each grape variety in the same terroir and draw scientific conclusions that serve the business and viticulture in general.

2. To preserve part of Portuguese wine heritage, planting grape varieties that are at risk of disappearing.

3. To study the adaptation of each variety to climate change and more sustainable production methods (organic viticulture), in order to guarantee the quality of our wines in the future. From this field, micro-vinifications have already been made of the following varieties: Cercial, Folgasão, Tinta Francisca and Vinhão.



WineClimAdapt - Selection and optimization of the most well adapted to climate change scenarios castes

Entidade líder do projeto: INSTITUTO NACIONAL DE INVESTIGAÇÃO AGRÁRIA E VETERINÁRIA IP

Responsável pelo projeto: José Silvestre

Action plan area: Viticulture

Parceiros:

ESPORÃO, S.A.; FACULDADE DE CIENCIAS DA UNIVERSIDADE DE LISBOA; VITICERT - ASS. NAC. DE VIVEIRISTAS VITICOLAS PROD. DE MAT. CERTIFICADO; VIVEIROS PLANSEL-PLANTAS SELECCIONADAS,LDA;

https://inovacao.rederural.gov.pt/grupos-operacionais/13-projectos-groupos-operacionais/111-selecao-e-valorizacao-das-castas-mais-bem-adaptadas-a-cenarios-de-alteracoes-climaticas-wineclimadapt

viticultura

Tolerância ao escaldão na vinha: uma variável a considerar num contexto de alterações climáticas

viticultura

Quadro 2 – Intensidade do escaldão verificado nas castas brancas (1 muito tolerante a 5 muito sensível) do Campo Ampelográfico da Herdade do Esporão (CAHE) e da Coleção Ampelográfica Nacional (CAN), 2018

Casta	CAHE			CAN			Casta	CAHE			CAN		
	Este	Oeste	Média	Este	Oeste	Média		Este	Oeste	Média	Este	Oeste	Média
Alfrocheiro Branco	1	2	1	3	3	3	Luzidio	1	3	2	2	2	2
Alicante Branco	1	2	1	1	1	1	Macabeo	1	2	1			
Almafra	1	3	2	2	3	2	Malvasia	2	4	3	1	1	1
Alvadurão	1	2	1	2	4	3	Malvasia Babosa	1	4	3	3	4	3
Alvarinho	3	5	4	3	4	4	Malvasia Cândida	1	2	2	2	3	2
Antão Vaz B	1	3	2	5	5	5	Malvasia Fina	1	2	1	1	1	1
Arinto	2	3	2	1	2	2	Malvasia Rei	1	2	1	1	2	2
Arinto do Interior	1	2	1	3	4	4	Manteúdo	1	3	2	1	1	1
Arinto do Pico	1	2	2	2	2	2	Molinha Macia	1	1	1	1	1	1
Avesso	4	5	4	1	5	3	Montua	2	4	3			
Azal	1	4	2	1	2	1	Moscatel Galego Branco	1	2	1	1	3	2
Barcelo	1	2	2	2	3	2	Moscatel Graúdo	2	3	2	1	2	2
Bastardo Branco	1	4	2	4	5	4	Moscatel Nunes	1	3	2	1	1	1
Batoca	1	2	2	2	3	3	Mourisco Branco	1	2	1	2	2	2
Beba	1	1	1	5	5	5	Müller Thurgau	1	2	1	1	3	2
Bical	2	3	2	2	2	2	Pardina	1	2	1			
Binzelo	1	1	1	1	1	1	Parellada	1	1	1	2	3	2
Boal Espinho	1	3	2	2	2	2	Pé Comprido	1	2	1	3	3	3

Quadro 4 – Intensidade do escaldão verificado nas castas tintas (1 muito tolerante a 5 muito sensível) do Campo Ampelográfico da Herdade do Esporão (CAHE) e da Coleção Ampelográfica Nacional (CAN), 2018

Casta	CAHE			CAN			Casta	CAHE			CAN		
	Este	Oeste	Média	Este	Oeste	Média		Este	Oeste	Média	Este	Oeste	Média
Alfrocheiro	1	3	2	1	2	1	Manteúdo preto	1	3	2	3	3	3
AlicanteBouschet	5	5	5	2	2	2	Marselan	4	5	4	1	1	1
Alvarelhão Ceitão	1	3	2	1	2	1	Marufo	2	5	3	1	4	3
Alvarelhão	1	1	1	1	2	1	Merlot	1	3	2	1	3	2
Amaral	1	3	2	1	2	1	Molar	1	2	2	1	1	1
Amor-Não.Me-Deixes	2	3	3	1	2	2	Monvedro	2	3	2	2	3	2
Amostrinha	1	3	2	1	2	1	Moreto	1	2	1	1	3	2
Aragonez	1	2	2	1	2	2	Moscatel Galego Tinto	1	2	2	1	3	2
Azal Espanhol	2	5	4	1	1	1	Negra Mole	1	4	2	1	1	1
Azal Tinto	1	2	1	1	2	1	Patorra	1	4	2	1	2	2
Baga	1	2	1	1	1	1	Pedral	1	2	2	1	4	3
Bastardo	1	1	1	1	2	2	Petit Verdot	5	5	5	1	1	1
Bastardo Tinto	2	2	2	2	5	3	Pical	3	5	5	1	2	1
Bobal	1	3	2	1	3	2	Pilongo	1	2	1	1	3	2
Bombalino	1	3	2	2	4	3	Pinot Noir	2	5	3	2	5	3
Borraçal	5	5	5	1	2	1	Preto Cardana	1	3	2	2	2	2
Branjo	1	2	2	1	1	1	Preto Martinho	1	3	2	1	1	1
Cabernet Franc	1	1	1	1	1	1	Prieto Picudo	2	2	2	1	1	1
Cabernet Sauvignon	1	4	3	1	1	1	Ramisco	1	1	1	1	1	1
Caladoc	1	3	2	1	1	1	Rufete	1	2	1	1	2	1
Camarate	1	3	2	2	5	3	Sangiovese	1	4	3	1	3	2
Carignan	3	4	3	1	1	1	Sousão	1	2	1	1	1	1
Carrasquenho	1	1	1	1	1	1	Syrah	3	5	4	1	1	1
Castelão	1	5	3	1	2	1	Tinta Barroca	2	4	3	2	2	2

i) the impact of the heat wave was due not only to its intensity and duration, but also to the lack of acclimatization of the vineyards and to the phenological state;

ii) there is a strong variability in the tolerance to the scald of the vegetal material;

iii) the sensitivity to scald is higher on the hedge faces exposed to direct solar radiation, and in particular when the air temperature is higher at the same time, this sensitivity also varies greatly with the variety; and

iv) the application of foliar reflectors (kaolin) did not lead to a greater tolerance to scald in the clusters.

it will be increasingly urgent to ensure adequate protection of vines against heat waves.

plantation planning, choice of varieties and rootstocks more tolerant to water and thermal stress, with high tolerance to scald, adequate line orientation (NE-SW), irrigation system with rapid response capability

change the driving systems for better protection of the grapes to direct solar radiation, modify the microclimate of the vineyard and reduce its temperature, irrigation system by nebulization or microsprinkling, at the level of the cover, or shading nets above the crop.

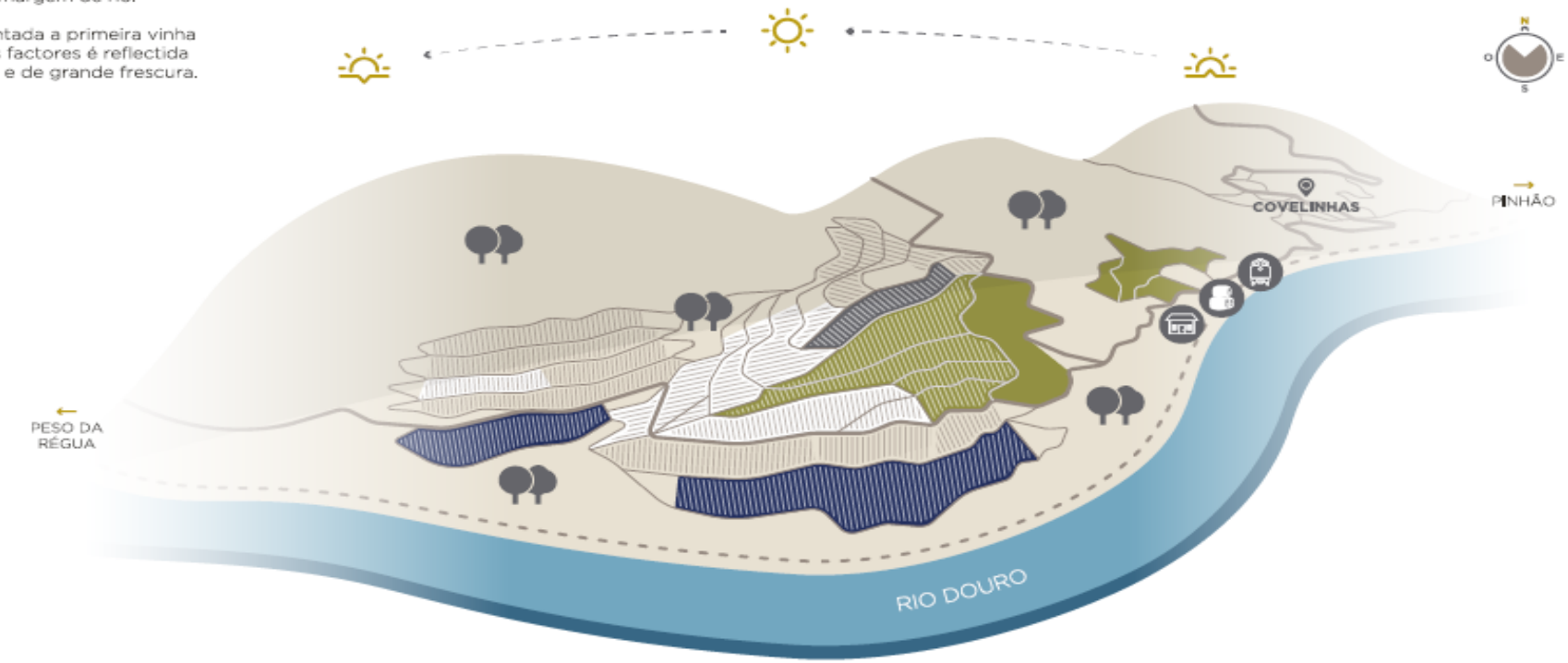
QUINTA DOS
MURÇAS
DOURO · PORTUGAL

QUINTA DOS MURÇAS

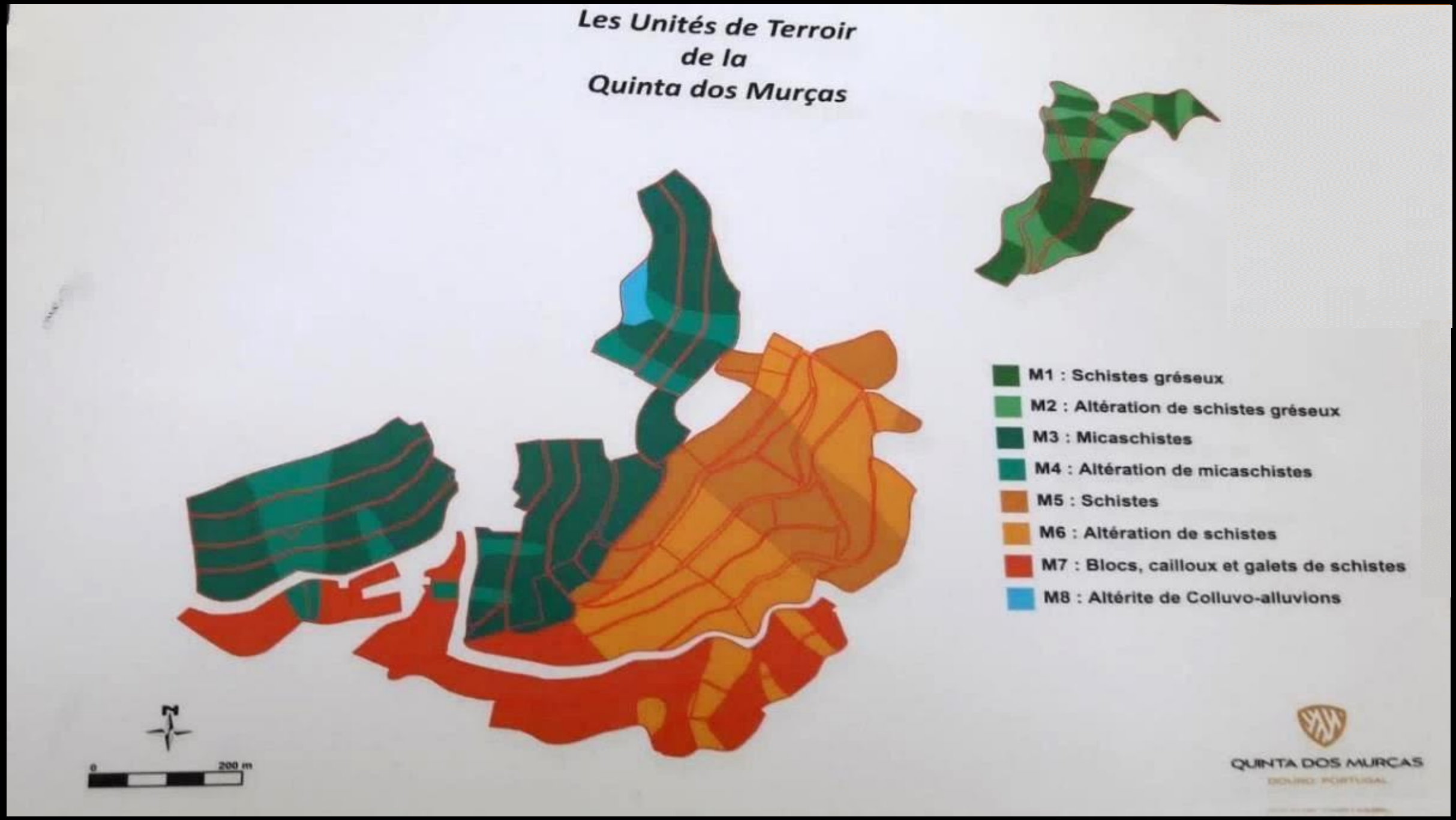
DIVERSIDADE – VERTICALIDADE – ELEGÂNCIA

A Quinta dos Murças situada no norte de Portugal, sub-região Cima-Corgo, na margem direita do rio Douro, entre a Régua e o Pinhão, caracteriza-se pela diversidade dos seus 8 *terroirs*, marcados por diferentes altitudes, exposições solares, solos xistosos, vinhas verticais e pela extensão de 3,2km de margem de rio.

É uma Quinta histórica onde, em 1947 foi plantada a primeira vinha vertical do Douro. Esta combinação de vários factores é reflectida em vinhos de *terroir* concentrados, elegantes e de grande frescura.



MINAS
MARGEM
VV47
RESERVA
RIO DOURO (Frente de rio da Quinta dos Murças de 3,2km)
VINHAS VERTICAIS
ÁRVORES DE FRUTO E MATA MEDITERRÂNEA
LINHA DE COMBOIO
ESTRADAS
N313-1
ESTAÇÃO DE COMBOIOS DE COVELINHAS
ADEGA
CASA


Les Unités de Terroir
de la
Quinta dos Murças
M1 : Schistes gréseux
M2 : Altération de schistes gréseux
M3 : Micaschistes
M4 : Altération de micaschistes
M5 : Schistes
M6 : Altération de schistes
M7 : Blocs, cailloux et galets de schistes
M8 : Altérite de Colluvo-alluvions
N
0
200 m
QUINTA DOS MURCAS

VV47 - Oldest vertical vineyards in the Douro Valley

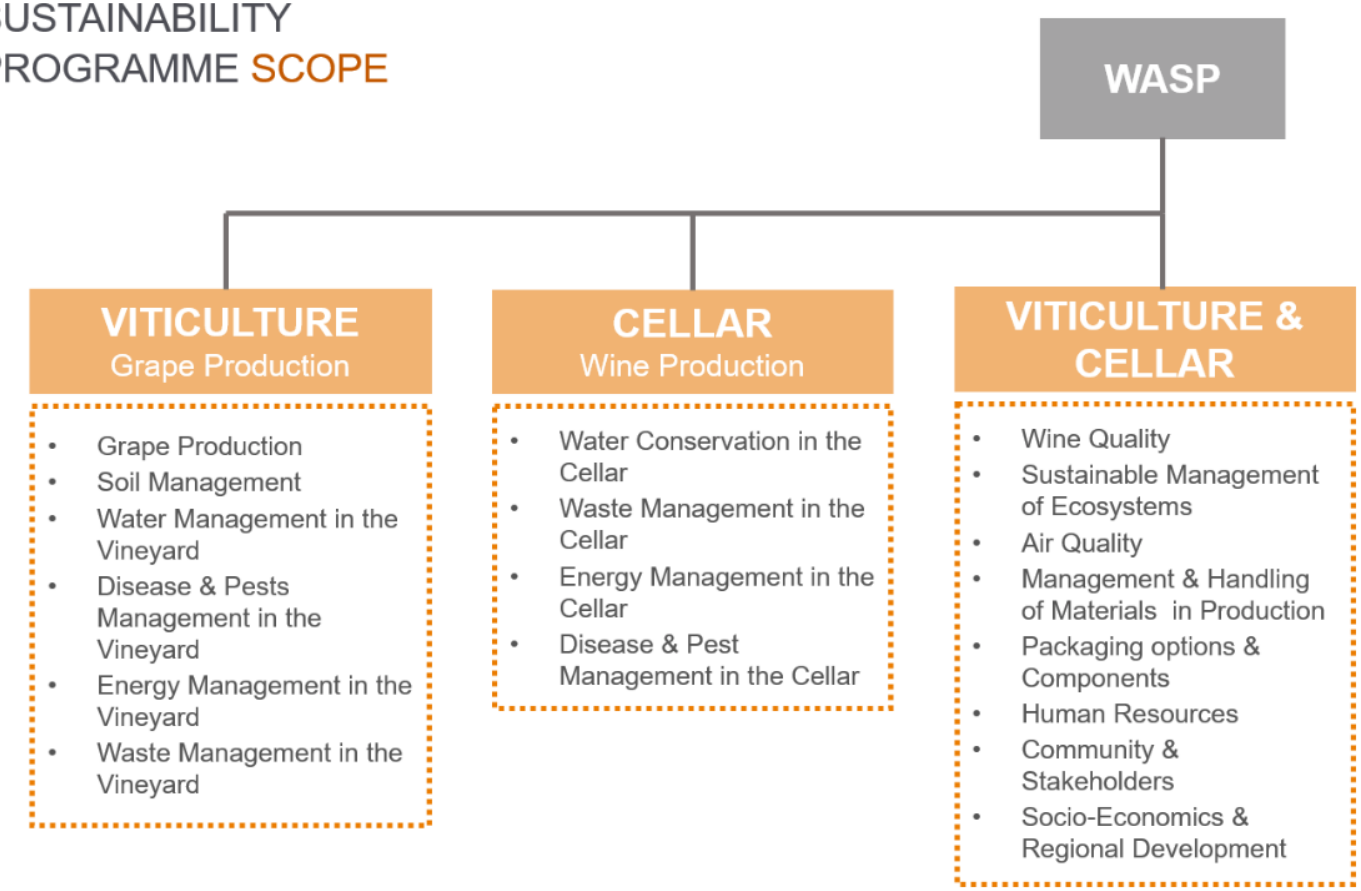
Ecological infrastructures, biodiversity-based strategies


Understanding the microbial community effects in a phytochemical-free vineyard
PROJETO EXPLORATÓRIO BioISI
PARCERIA BioISI|ESPORÃO
Project 'MICROBIOME'
Investigadores Principais:
Andreia Figueiredo
Ricardo Dias
Margarida Gama Carvalho
BioISI
Biosystems and Integrative Sciences Institute
Ciências ULisboa
QUINTA DOS MURÇAS
COVELINHAS · DOURO
ESPORÃO

Using genomic information to understand the communities of the soil and plant microorganisms in order to:

- *Develop an early detection system for fungal diseases;*
- *Identify native yeasts and bacteria that interfere with the winemaking process*
- *Monitor and control stresses related to water, nutrients and climate change adaptation;*
- *Terroir certification and tracking record*

WINES OF ALENTEJO SUSTAINABILITY PROGRAMME SCOPE



Chapter	Number of Criteria
Grape Production	14
Soil Management	12
Water Management in the Vineyard	4
Disease & Pests Management in the Vineyard	23
Energy management in the Vineyard	3
Waste Management in the Vineyard	2
Water Conservation in the Cellar	15
Energy Management in the Cellar	8
Waste Management in the Cellar	16
Disease & Pest Management in the Cellar	1
Human Resources	10

ECONOMIA | Expresso

ÚLTIMAS OPINIÃO ECONOMIA EXPRESSO CURTO PODCASTS TRIBUNA MULTIMÉDIA 2:59 DOCUMENTÁRIOS

ECONOMIA

José Roquette premiado em Londres com o "The Lifetime Achievement"

21.11.2018 às 13h16

O The Drink Business Green Awards é um "prémio verde", com o foco em questões ambientais no sector da bebida. Este ano, distinguiu o fundador do Esporão

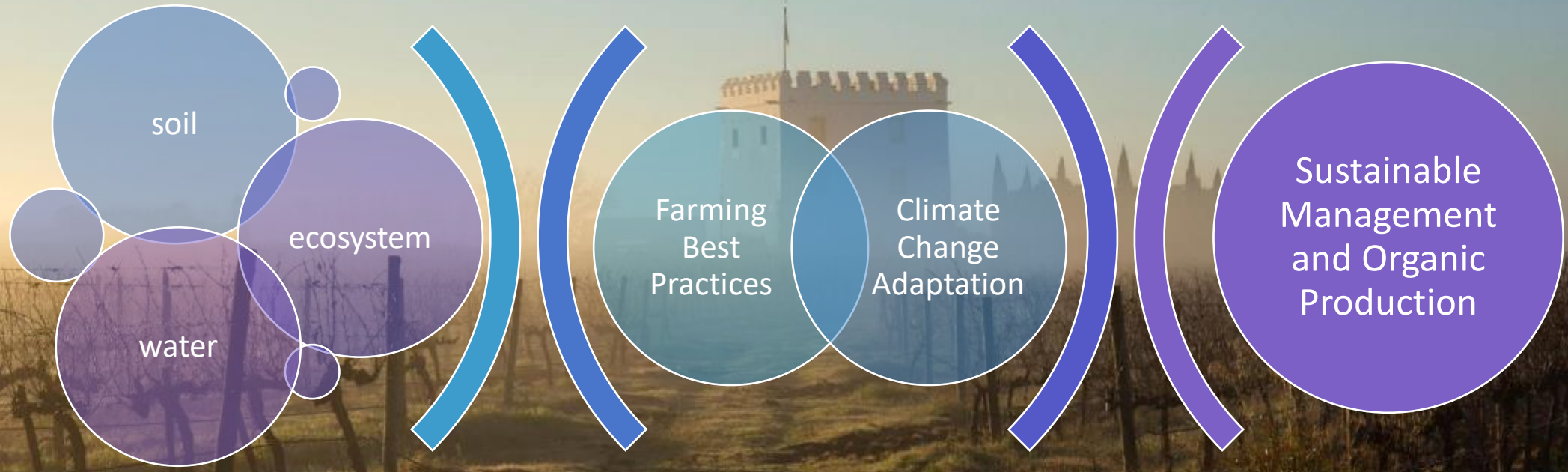
José Roquette, founder of Esporão

This year's Lifetime Achievement Award went to a person who started life in banking but, since the 70s, has driven a successful wine business, while creating a green leader in the world of drinks production. Indeed, the business he founded in Portugal back in 1973 was a previous winner of our Sustainability Award, and has been a shortlisted company for other categories in former ceremonies, not least the winery's worthy attempt to prevent the construction of the Tua Valley dam in the beautiful Douro Valley, near Porto, where our recipient was raised.

At his winery estate, which is based in the Alentejo, he has created a wetland conservation area, and made the company the first in the wine business to join the 'Countdown 2010' biodiversity initiative, as well as converted his entire production to organic farming. In particular he has spearheaded an ampelographic vineyard to preserve almost 200 native Portuguese grape varieties, while, also, proving his socially-responsible bent, provided free English classes for his employees, while adopting an ethical business code.

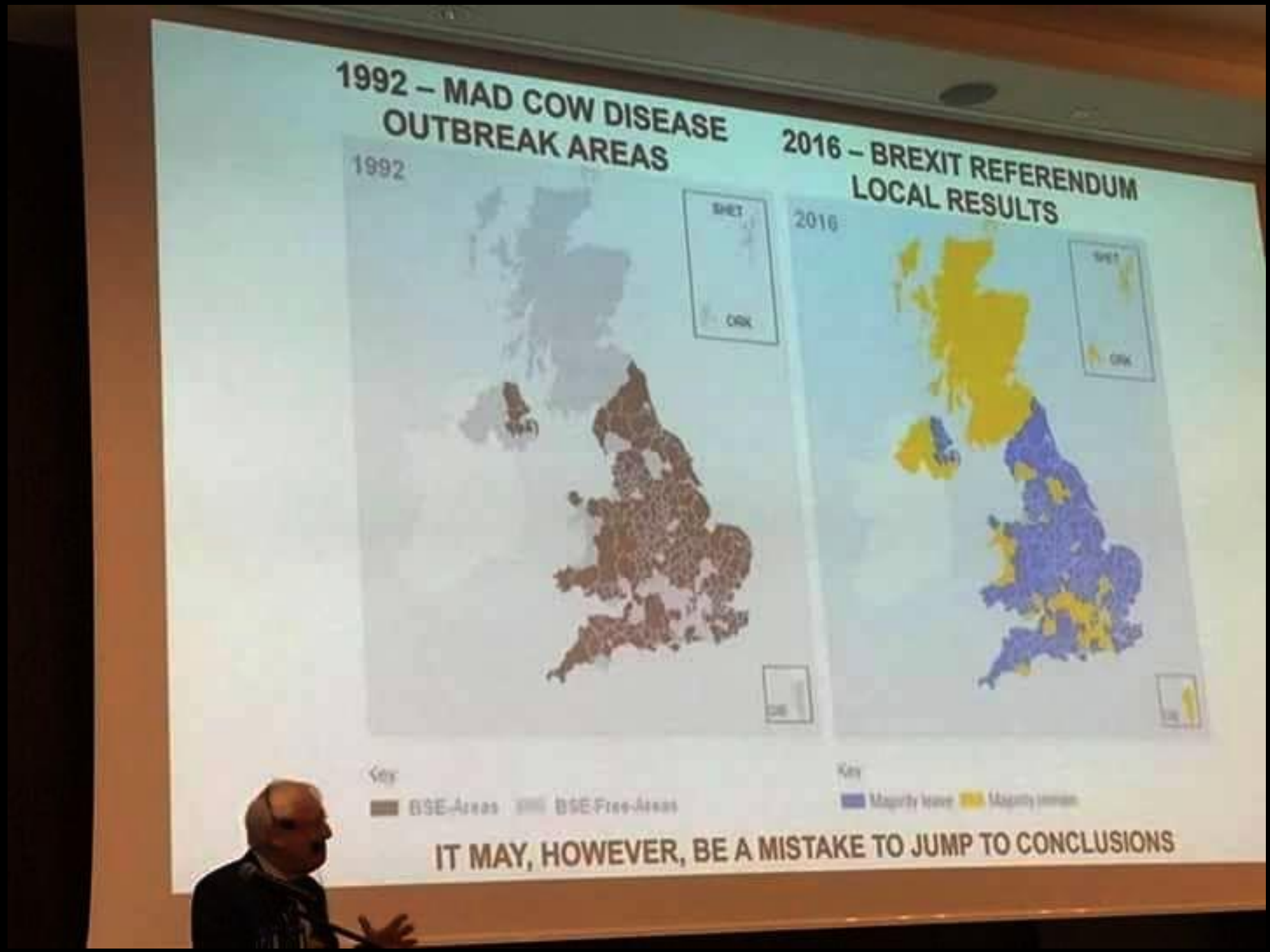
Now in his 80s, our recipient has done an enormous amount to further ecological and ethical initiatives in the wine business in Portugal, making him a very worthy recipient of 2018's Green Lifetime Achievement Award.

In short…



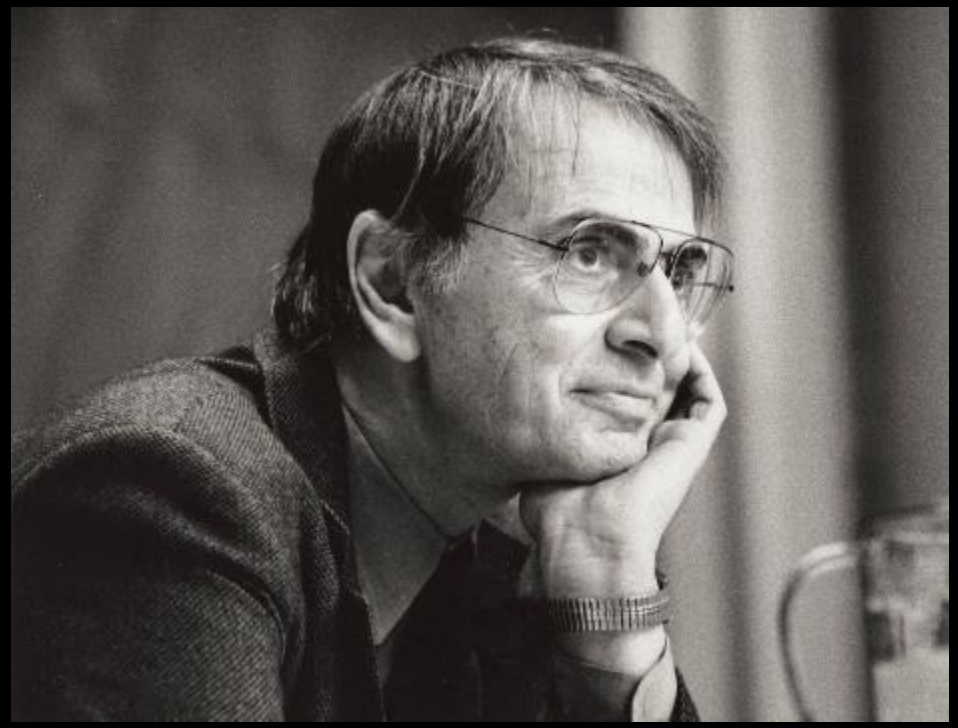
Focal Points Integration Business Model


RESERVED FOR GREEN VEHICLES
RESERVED FOR GREEN VEHICLES


1992 – MAD COW DISEASE OUTBREAK AREAS
1992
SHET
ORK
2016 – BREXIT REFERENDUM LOCAL RESULTS
2016
SHET
ORK
Key
BSE-Areas
BSE-Free-Areas
Key
IT MAY, HOWEVER, BE A MISTAKE TO JUMP TO CONCLUSIONS

Scientific advances in medicine and agriculture have saved vastly more lives than have been lost in all the wars in history.

— Carl Sagan in ‘The Demon-Haunted World: Science as a Candle in the Dark’ (1996)



SCIENCE AND FACTS !!!


INDIAN HILLS
COMMUNITY CENTER
SOME PEOPLE
ARE WISE
SOME ARE
OTHERWISE

Nuno Oliveira,

Ecosystem Manager, Esporão SA