

9th European Conference on the Implementation of the Water Framework Directive – Europe INBO

9th General Assembly - MEMBO

The irrigation in Spain and Europe . Climate Change effects.

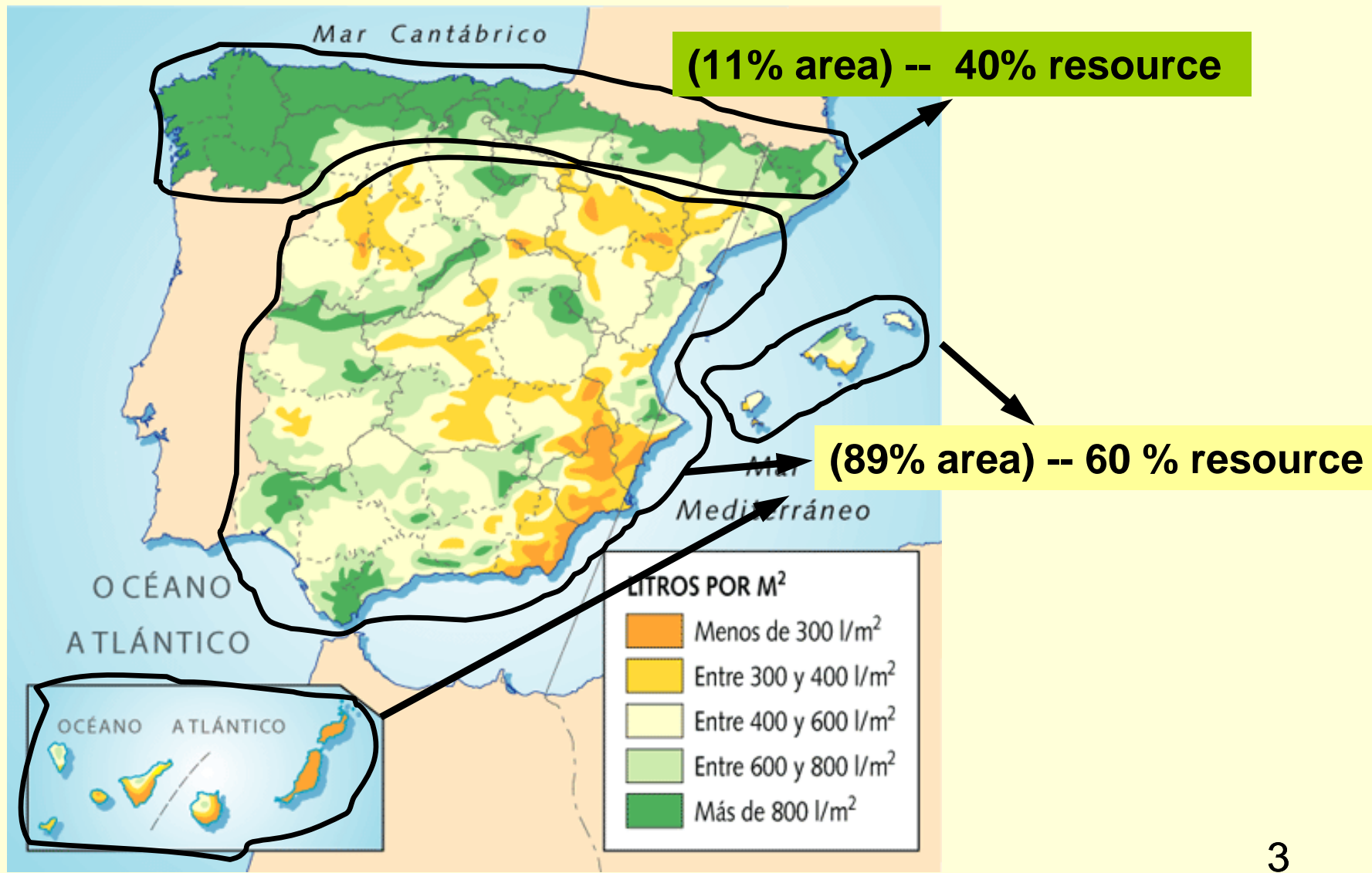
September 27-30, 2011, Oporto, Portugal

Andrés del Campo García. *President of:*

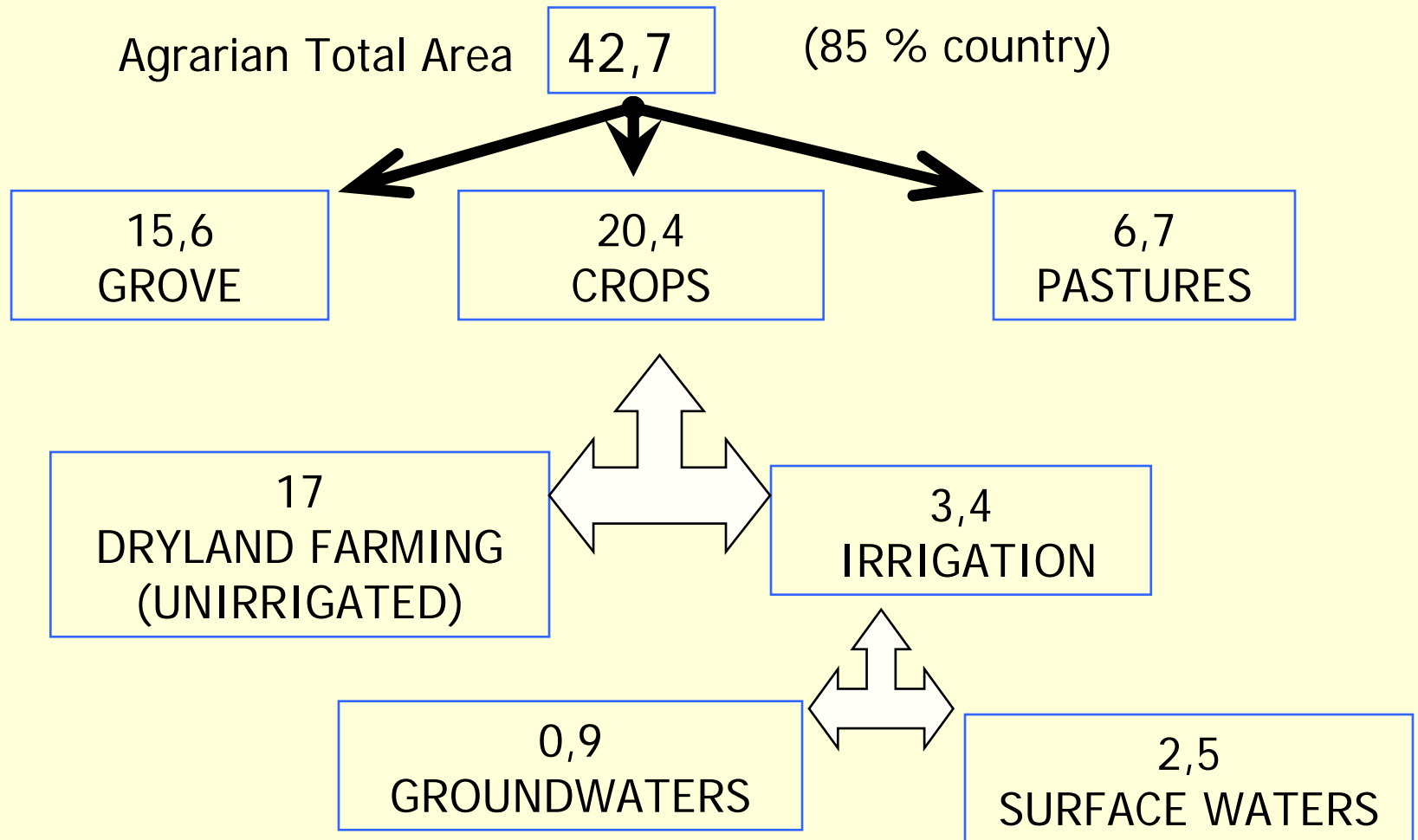
- *Federación Nacional de Comunidades de Regantes de España (FENACORE)*
- *Euromediterranean Irrigators Community (EIC)*

Population	47.021.031	(2010)
Area	504.645	km ²
Average rainfall	680 mm	= 340.000 hm ³ /year
Annual average runoff	180 mm	
Reservoir capacity	54.000	hm ³
Regulated resources	43.000	hm ³
Regulation potencial	70.000	hm ³
Number of dams	1.300	
North part Spain(11% area)	40%	resource
Rest part (89% area)	60 %	resource

Water in Spain



Soil uses in Spain. Spanish Irrigation



Irrigation in Spain

• **Spanish Irrigation** is the biggest water use demand: 24,250 Hm³ per year, accounting for almost 80% of consumptive uses years ago. The consumption has been reduced to 63%, with about **15,300 Hm³** according National Institute of Statistics.

• **In Spain, irrigation accounts** for about 14% of the total area under cultivation, and nearly 60% of Spanish agricultural final production

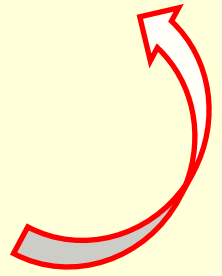
Evolution of Irrigation Systems in Spain

WATER SAVINGS.

IRRIGATION SYSTEM	Before 2.000		2.009 year		2.010 year	
	Hectares	%	Hectares	%	Hectares	%
Flooding (gravity)	1.973.336	59	1.064.248	31,1	1.043.704	30,6
Sprinkling and others	802.712	24	765.440	22,4	735.544	21,6
Dripping	568.588	17	1.591.616	46,5	1.628.705	47,8
TOTAL	3.344.636	100	3.421.304	100	3.407.953	100

Source: PNR 2001 y encuesta sobre superficies y rendimientos de cultivo

14.000 Ha of Irrigation reduced



Perimeter of Irrigation Areas in Spain

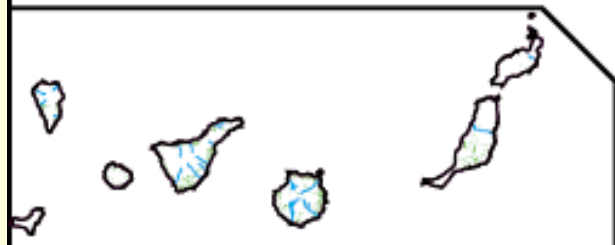


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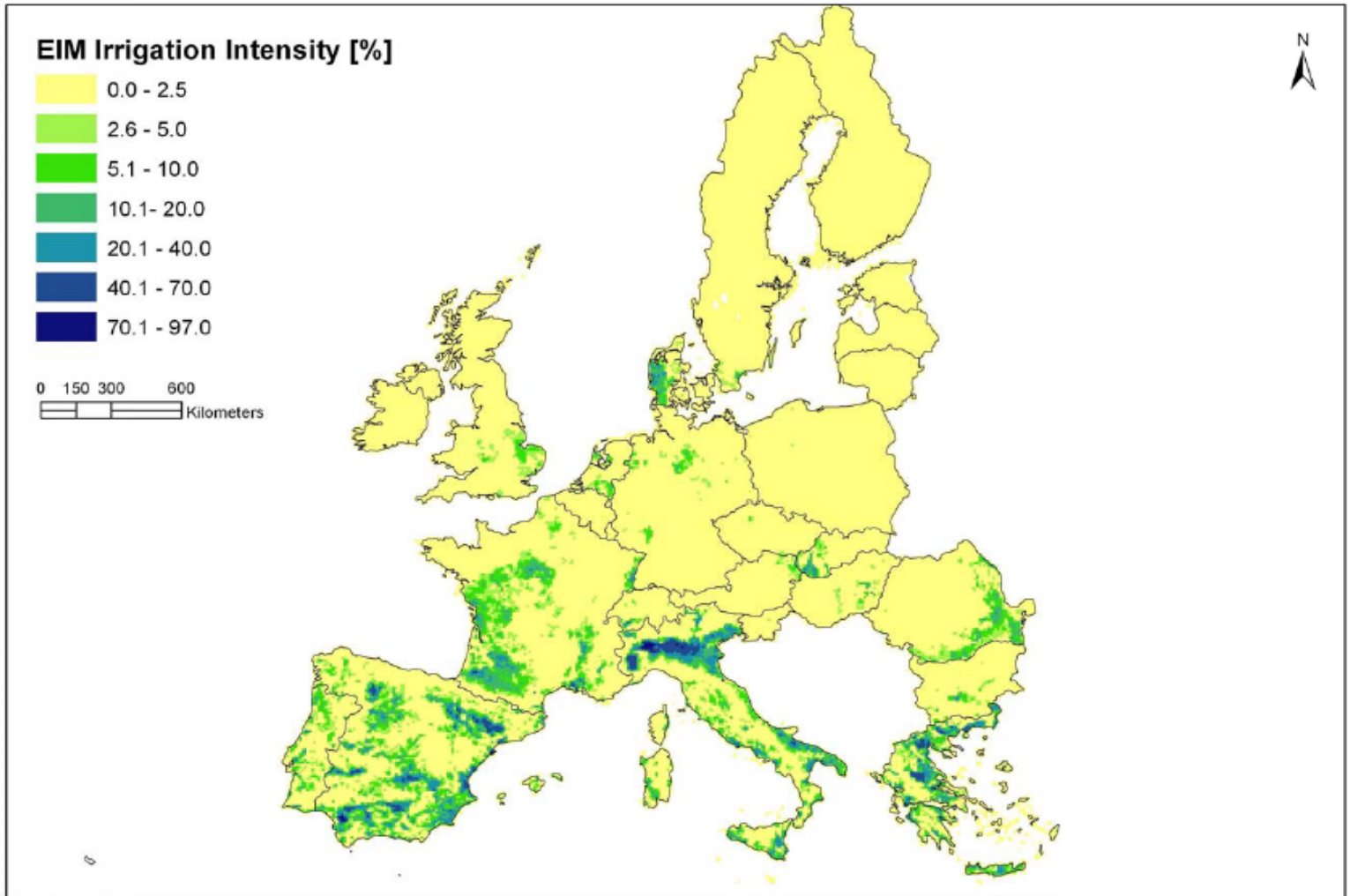
PERÍMETROS DE RIEGO:	Nº. REGADAS
Perímetro cartografiado:	4.700.578
Regable cartografiado:	3.578.727
Regable sin cartografiar:	184.907
Total regable:	3.763.634
Regado en campaña:	3.244.837



 MINISTERIO DE AGRICULTURA, PESCA Y ALIMENTACIÓN	SUBSECRETARÍA	Proyección UTM Huso 30 Elipsoide Hayford	PLAN NACIONAL DE REGADÍOS	FECHA I Mayo, 01	MAI/M 20
	DIRECCIÓN GENERAL DE DESARROLLO RURAL	Edita: ServJrV/Geografía	PERÍMETRO DE LOS REGADÍOS EXISTENTES	ESCALA I 1:25.000.000	HOJA I 1

Perimeter of Irrigation Areas in Europe

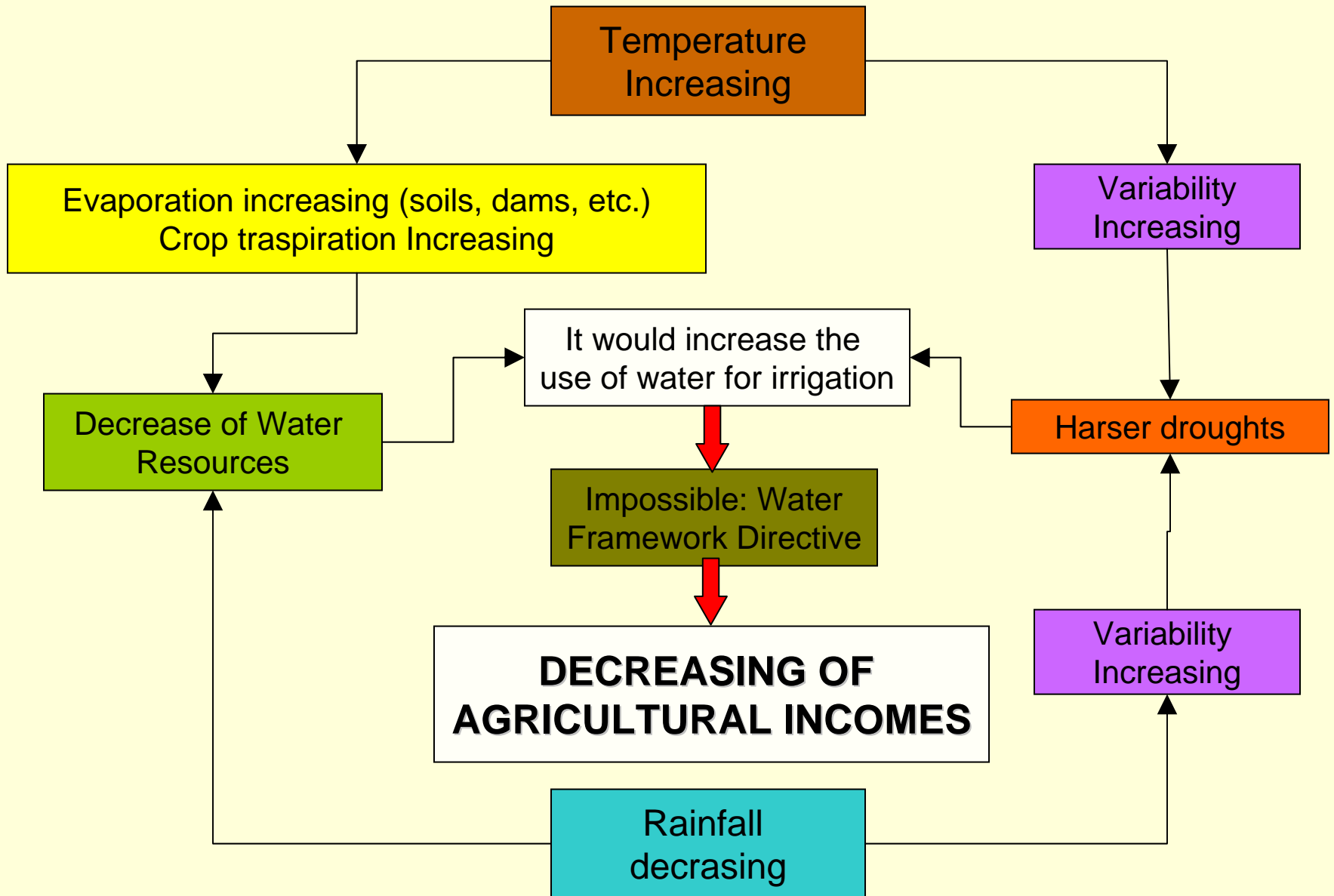
Figure 5: European Irrigation Map (EIM) - Irrigation intensity in the EU as irrigated area in % of total area calculated over a 10x10km raster. NB: the regions shown are at the NUTS 2 level.



Irrigated Areas in Europe

Country	Country	Irrigable Area (ha) 2000	Irrigated Area (ha) 2000	Irrigable Area (ha) 2003	Irrigated Area (ha) 2003	Irrigated Area (ha) EIM	AWA (%)
AT	Austria	95240		90420	34230	35900	2.7
BE	Belgium	31970		21110	1610	1610	0.1
BG	Bulgaria			124480	79370	79370	19.6
CH	Switzerland					43820*	74.5
CY	Cyprus			44930	35410	35410	0.8
CZ	Czech Republik			39380	16450	16850	26.4
DE	Germany					234587*	2.9
DK	Denmark	446930		448810	201460	201460	2.2
EE	Estonia					0	14.9
ES	Spain	3475560	3233020	3135930	2849830	3233020	0.5
FI	Finland	88140		100480	0	0	87.8
FR	France	2633350	1575520	2233110	1656780	1575520	3.9
GR	Greece	1321340	1161000	1487210	1278950	1161000	13.7
HU	Hungary	308110	67080	242160	148680	67080	-
IE	Ireland	0	0	0	0	0	18.3
IT	Italy	3855960	2453440	2902000	1746990	2453440	1.9
LT	Lithuania			250		0	0.3
LU	Luxemburg	0	0	0	0	0	-
LV	Latvia	450	0	450	0	0	0.8
MT	Malta			2000	1850	1850	9.7
NL	Netherlands	498280		350560	62150	62150	80.1
PL	Poland			98450	46920	46920	11.8
PT	Portugal	792000		674820	229910	229912	7.8
RO	Romania			1510830	400420	400420	2.1
SE	Sweden	136730		188440	53450	53450	64.9
SI	Slovenia	2230		1880	1880	1880	5.6
SK	Slovakia	225310	110670	209060	104540	110670	
UK	United Kingdom	950 ¹⁾		96120 ¹⁾	96120 ¹⁾	148019*	-
EU27 and CH						10158440	

Consequences of the Climate Change



Water regulation on the world

- There are approximately 40,000 large dams.
Reservoir capacity and robustness of a country or region:
 - California: 850 days
 - Spain(total): 65 days
- How will the impact of climate change influence?
- **Irrigation:** 20% of the cultivated area is irrigated. 300 million hectares and 33% of the world food supply. They use 75% of available water.
- **Hydropower:** 20% is generated by water and is only 7% of world potential.

Source: UNESCO 2005-2015: International Decade for Action 'Water for Life'

Overcoming the challenges of the XXI century agriculture

Facts:

- Growing world population
- Existence of more than one billion undernourished people
- Significant pressure on the natural resources (land and water)

Limitations :

- a) less arable land and less fresh water per capita in the world
- b) new farming based on methods and practices least-CO₂ and methane.

To overcome the challenges of agriculture, it's needed:

- 1. To increase productivity by using more technology / ha in the future world.*
- 2. Water is seen as a scarce good, but necessary to increase productivity to ensure food for future humanity.*

SOLUTION: Biotechnology and irrigated agriculture are and will be the solution to the hunger of today and tomorrow.



Thank for your attention

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