An international Exchange of Experience

Economic Analysis according to the WFD: Status of Implementation

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„Characterisation report WFD 2004 – Economic analysis of water use in agriculture Work in progress“

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Characterisation report WFD 2004

Economic analysis of water use in agriculture

Work in progress

The approach

- Create a working group with the Ministry of Agriculture.
- Scan of information and information sources.
- Define the objectives, the purpose of analysis.
- Analyse methodological alternatives
- Expert consultation
- Institutional consultation
- Pilot analysis at RB level.
- Application to all River Basins

Who participates

Working group	Officials in change of animal farming, fisheries, agriculture, rural development and structural funds; IMPRESS and economics.
Scan of information Methodological alternatives	Agricultural Economics Department. University of Madrid
Expert consultation	Agr economiccs Univ. Of Cordoba, Valencia, Salamanca, Granada and Zaragoza; Research Depart. Regional Gov. Andalucia and Aragon; ecologists.
Institutional consultation	Ministry of agriculture; Regional Departments of agriculture “sectoral conference”
Pilot River Basin	Agr. Economics Univ. Of Madrid. Regional Depart. Of agriculture; Ministry of Agriculture; Head of Planning Office of the RBA; Local stakeholders.
All river basins	Focal points on economics in RBAs. Public company for agricultural advice

Progress...

Working group	XXX (meetings every two months)
Scan of information Methodological alternatives	XXX
Expert consultation	XXXX Pending december
Institutional consultation	December
Pilot River Basin	End of November End of December
All river basins	Integrated data base of technical and socio economic information. June 2004

Economic analysis of water use. What for?

- Inputs for baseline scenario.
- Inputs for the economic impact of measures.
- Inputs into disproportionate cost analysis.
- Inputs into analysis of effectiveness of measures

Others

- Inputs into designation of protected areas; HMWB and New modifications.

In Spain agriculture

- Not only causing diffuse polllution.
- Responsible for 80% of abstraction. So pressure on hydromorphological conditions.

Which questions to be answered?

Effectiveness	What technical characteristics will need to be acted upon? What is the effectiveness of pricing measures?
Baseline	How economic factors affect pressures and their evolution? What would be the risk of non compliance?
Economic impact of measures	What would be the changes in net margins; employment; productive orientation; indirect effects; effects on trade?;
Disproportionate costs	Benefits of water quality improvements (changes in use and non use value)
Protected areas	What is the economic value of aquatic species?

Scale	Sources	Technical	Socio-economic
Municipal	**Survey on crops** **Time series**	Has by crop for irrigated and rainfed agriculture	
GIS 700*700	**Survey on Yields of crops** **1990-1995 and onwards**	Has and yields by crop: rainfed; irrigation; greenhouse; type of technique of irrigation and inputs	
Municipal	**Agrarian census (time series 20 years)**	Nº of Farms;Has by crop and water origin; water use; watering technique.	
Irrigation unit **3000 ap.**	**Survey on characterisation of irrigation 1997 and 2000**	Crop yields; Structure of production; size of holdings, type of management; year of establishment; state of maintenance of irrigation infrastructure; use of inputs	
Irrigation unit **400**	**Socio-economic charcaterisation of irrigation agriculture 1997**		Income per crop and subsidies; value of production; cost of inputs(water;fertilisers;pesticides; energy; services; amortizations; labour); net margins
Municipal	**Animal farm survey** **Annual**	Number of animals per type; number of farms; inputs; waste	
National	**Prices by crop** **Monthly**		Prices per crop

Examples of purpose of economic analysis of water use and methodological “choices”

	“Pressures” Explained variables	Explanatory variables	Methodology
Characterisation 2000: Input to eonomic impact and Effectiveness of measures	Water use per ha Has irrigated Kg of pesticides per Ha Kg of fertilisers per Ha	Costs of inputs (including water) per type of crop; income per type of crop (including subsidies); prices of crops; technology of irrigation; source of water.	Water demand (and production functions) with Lineal program.; econometric modeling Simple technical specifications by typology (ratios/coefficients)
Projections- inputs into risk analysis	Same in 2015	Population trends Cost of inputs Irrigation techniques Evolution of crop prices (subsidies)	Extrapolation: simple or of explanatory variables Scenario analysis (uncertainty) Expert consultation

Requirements. When for? And implications

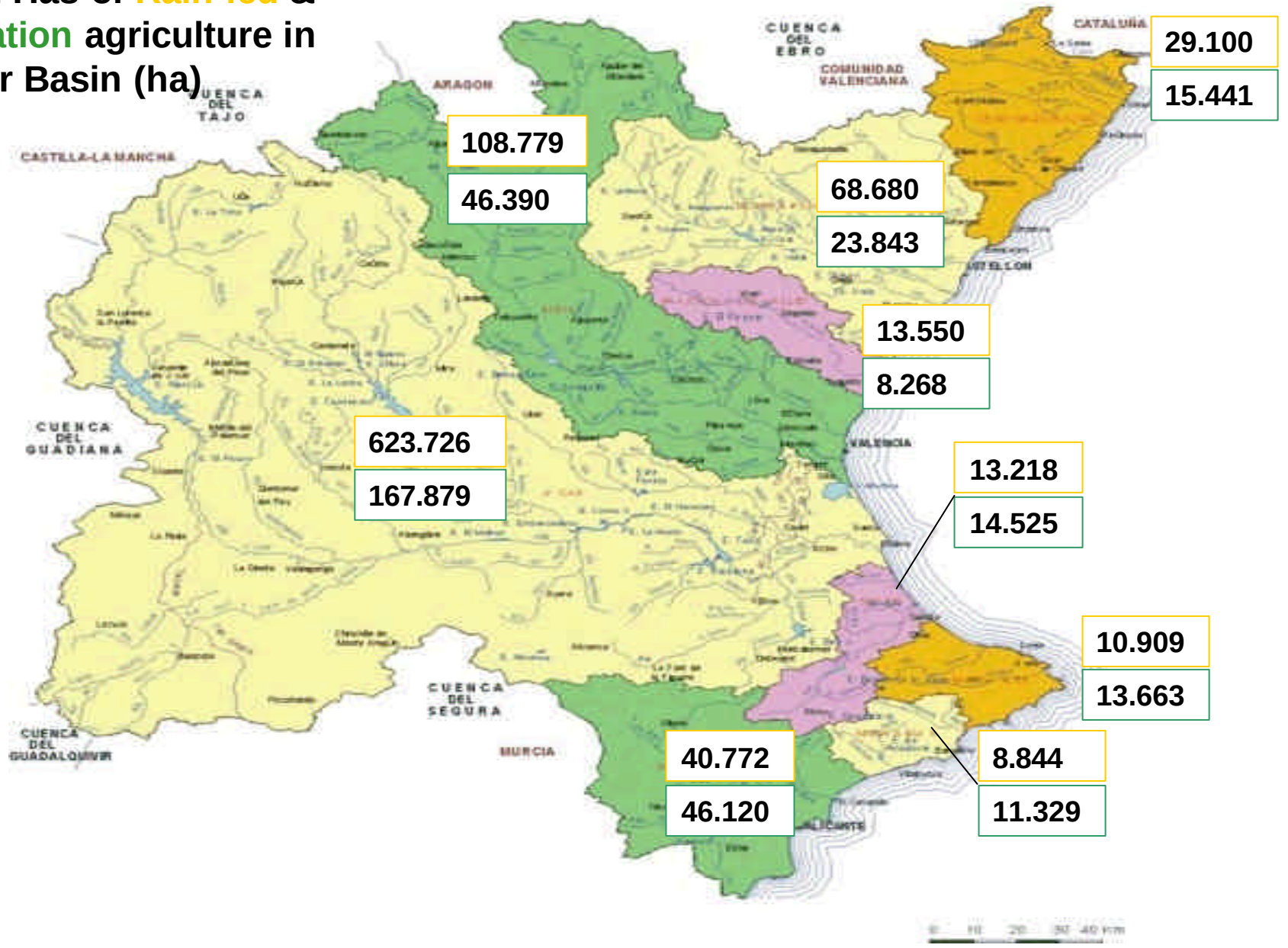
Effectiveness	2006-2009	Will need to be updated with progress in other Directives
Baseline	2004	Now
Economic impact	2006-2009	Will need to be updated
Disproportionate costs	2007-2009	Will need to be updated
Protected areas	2004	Now
HMWB and New modifications	2004 and onwards	Preliminary now

Data ambitions given dates

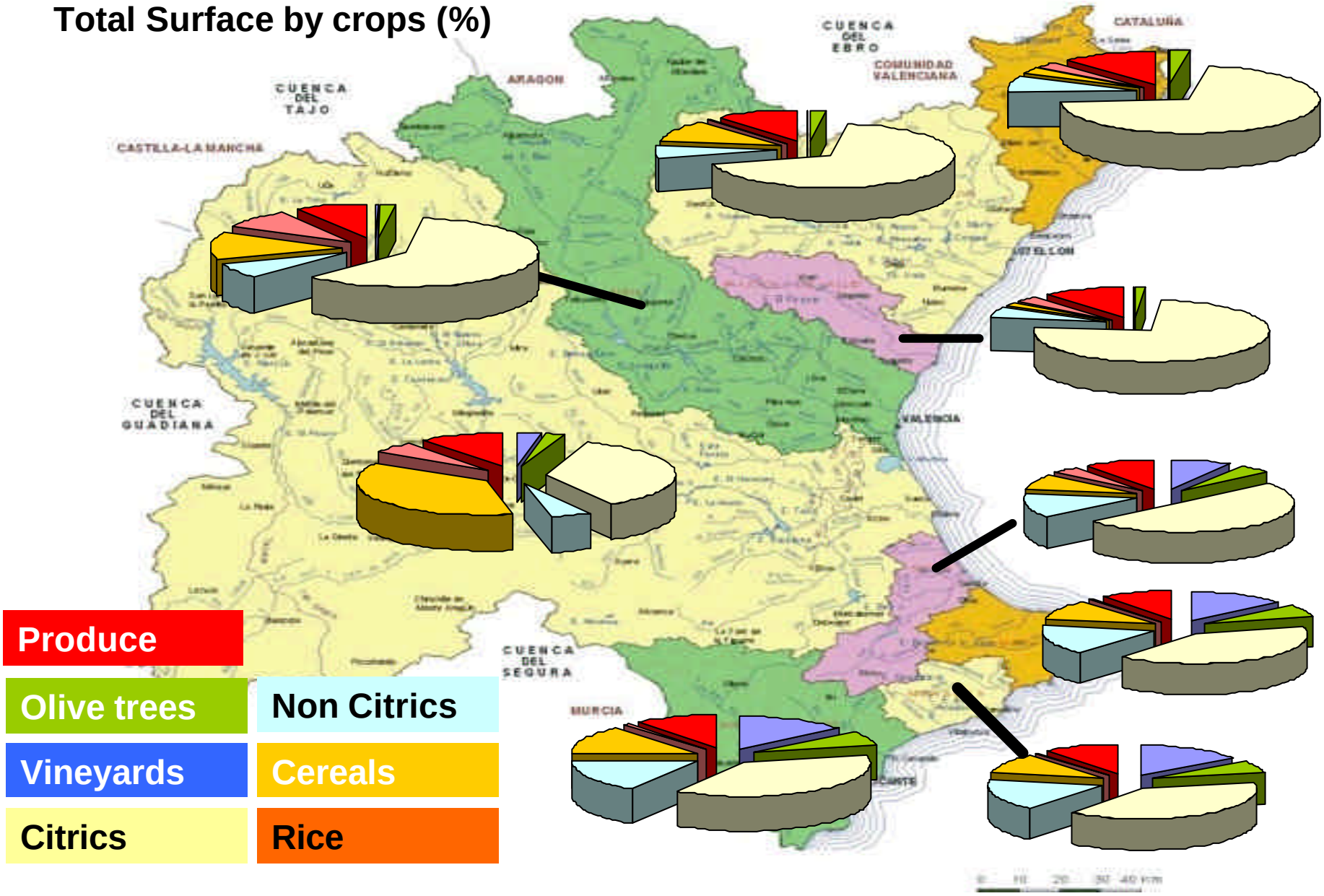
Effectiveness	Scan of data and indicate gaps and needs for changes
Baseline	Preliminary risk assesment but as above
Economic impact	Scan of data needs on the base of preliminary analysis
Disproportionate costs	Recommendations of analysis and information collection
Protected areas	Collect information
HMWB and New modifications	Use site specific data.

Preliminary results
Pilot Basin

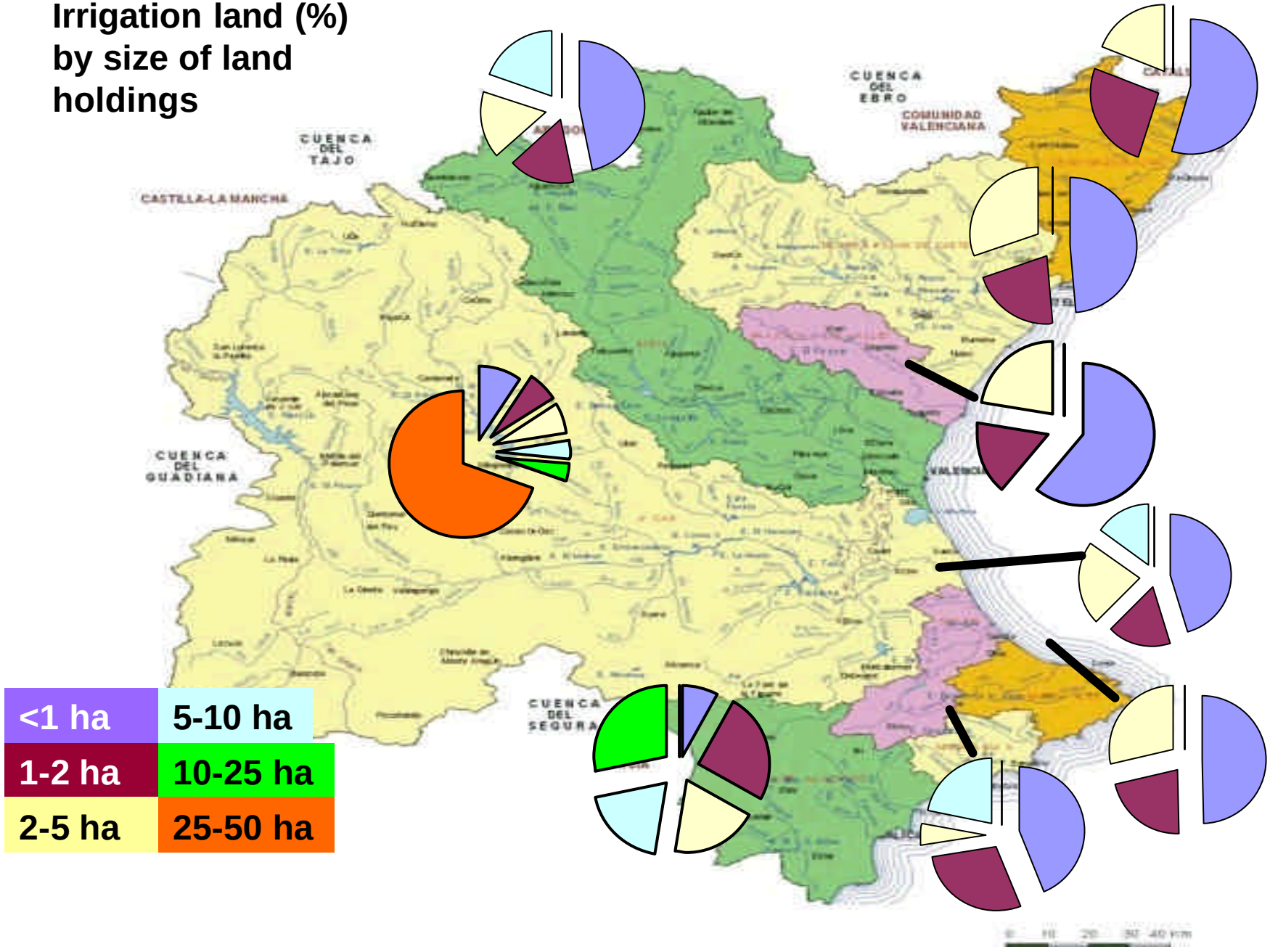
Total Has of Rain fed & Irrigation agriculture in Júcar Basin (ha)



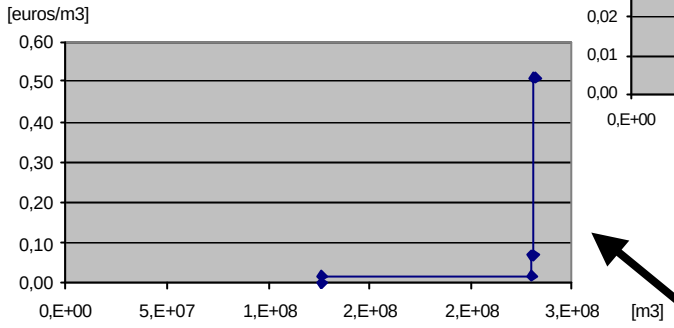
Total Surface by crops (%)

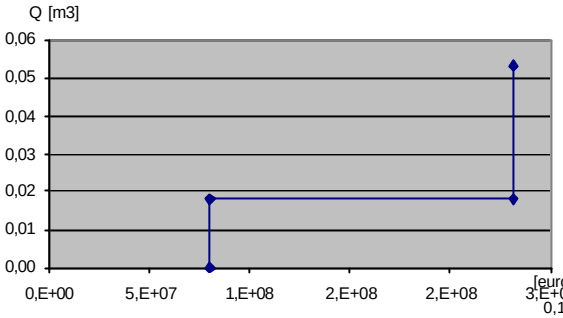


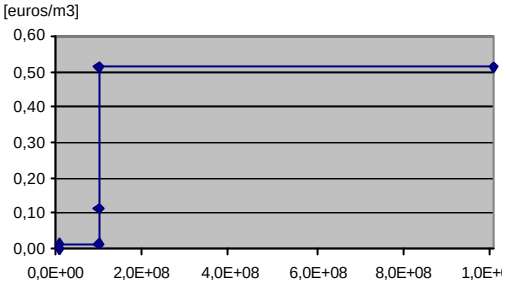
Irrigation land (%) by size of land holdings

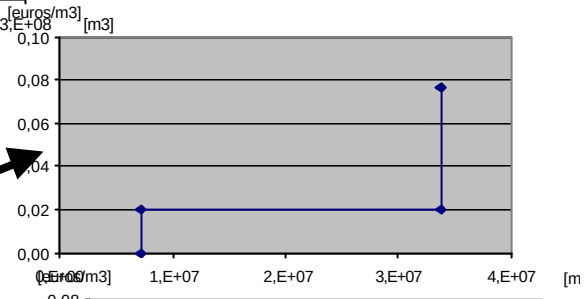


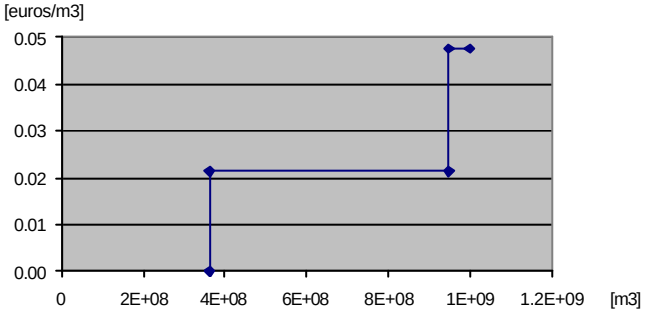
Structure of supply

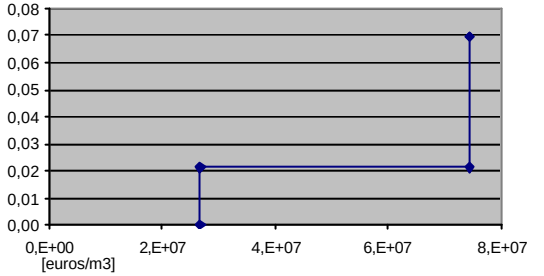


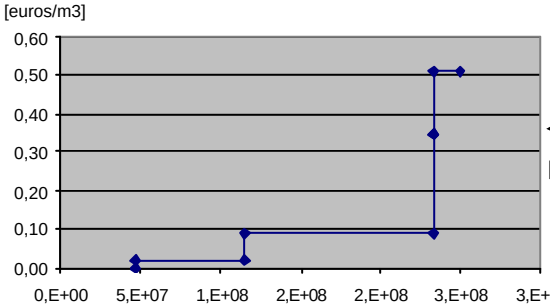


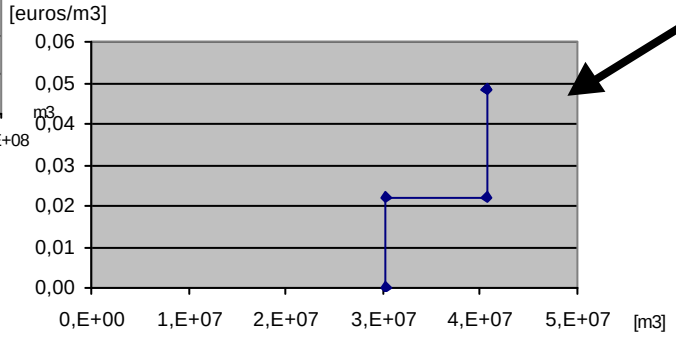


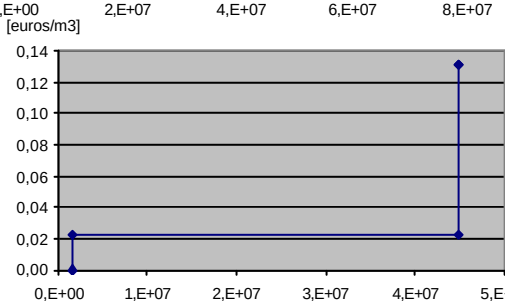




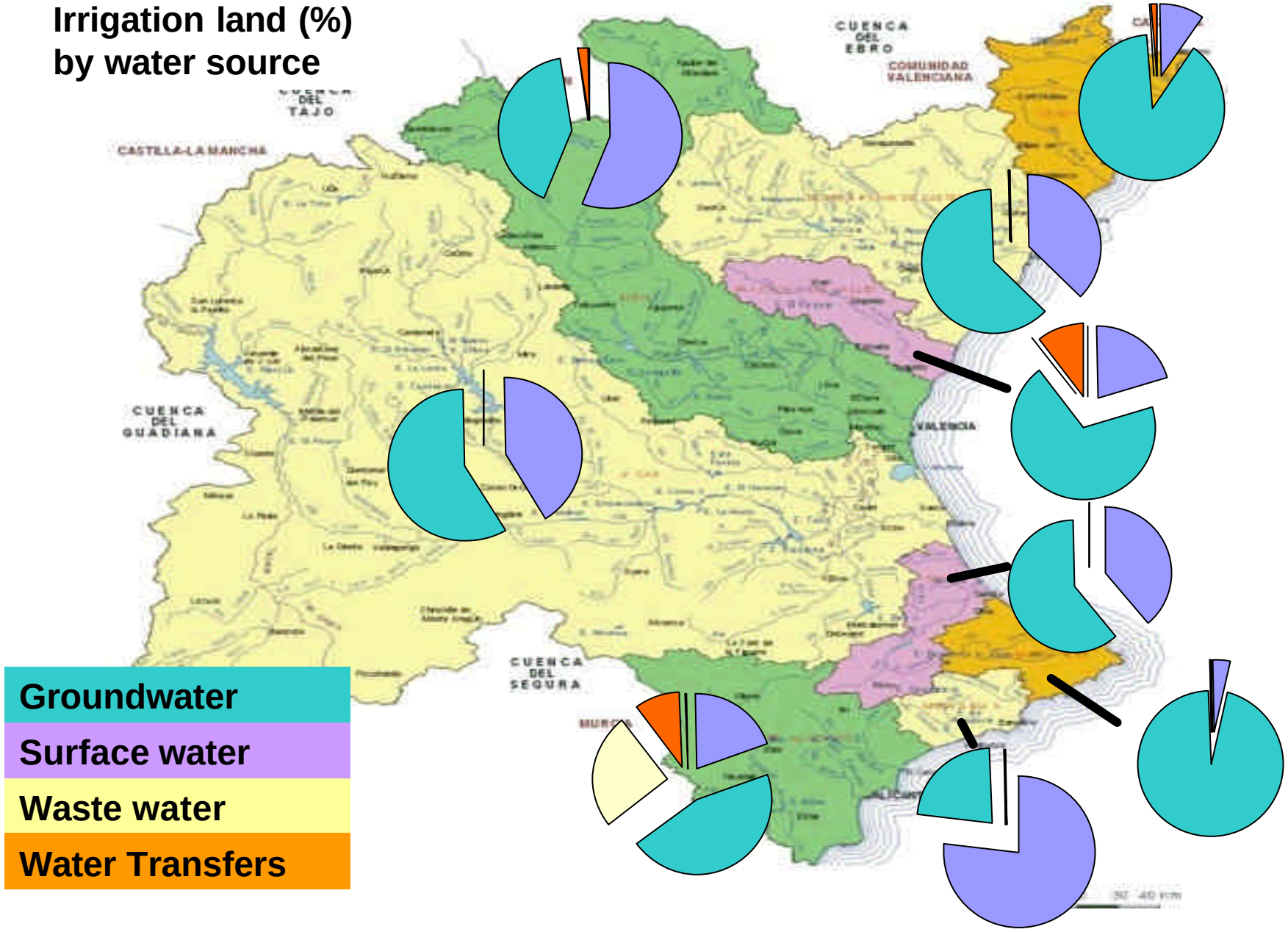




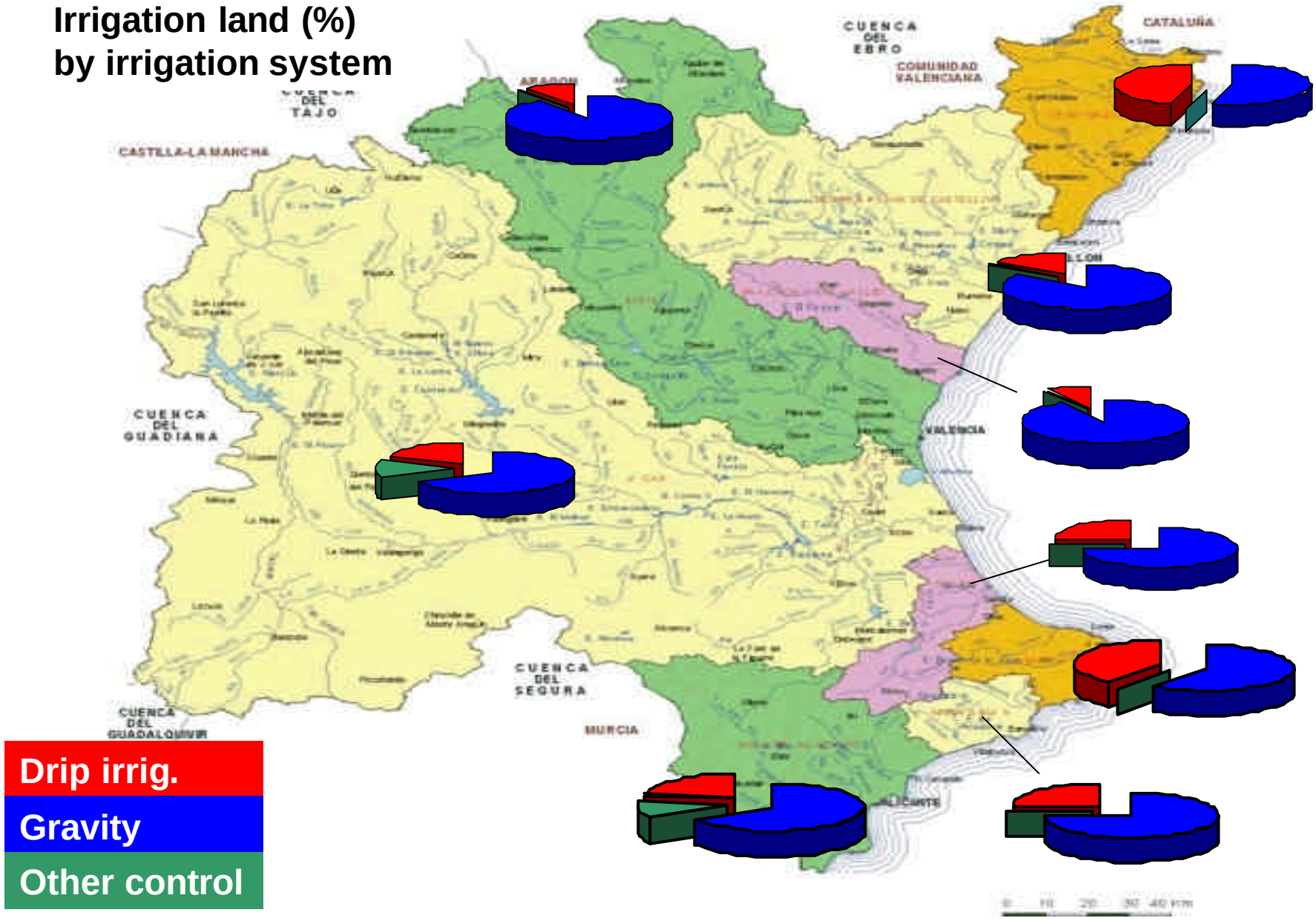




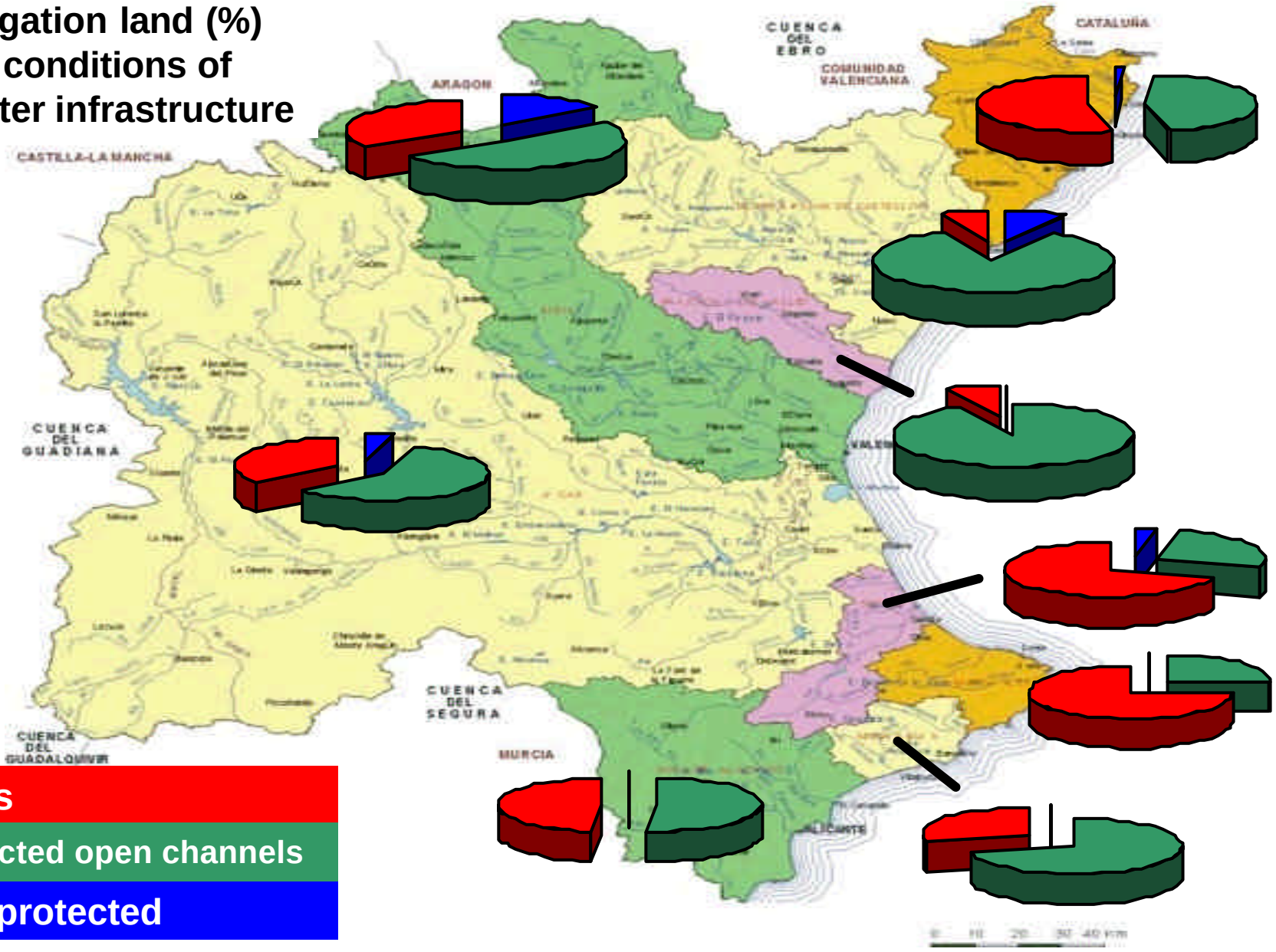
Irrigation land (%) by water source



Irrigation land (%)
by irrigation system



Irrigation land (%) by conditions of water infrastructure

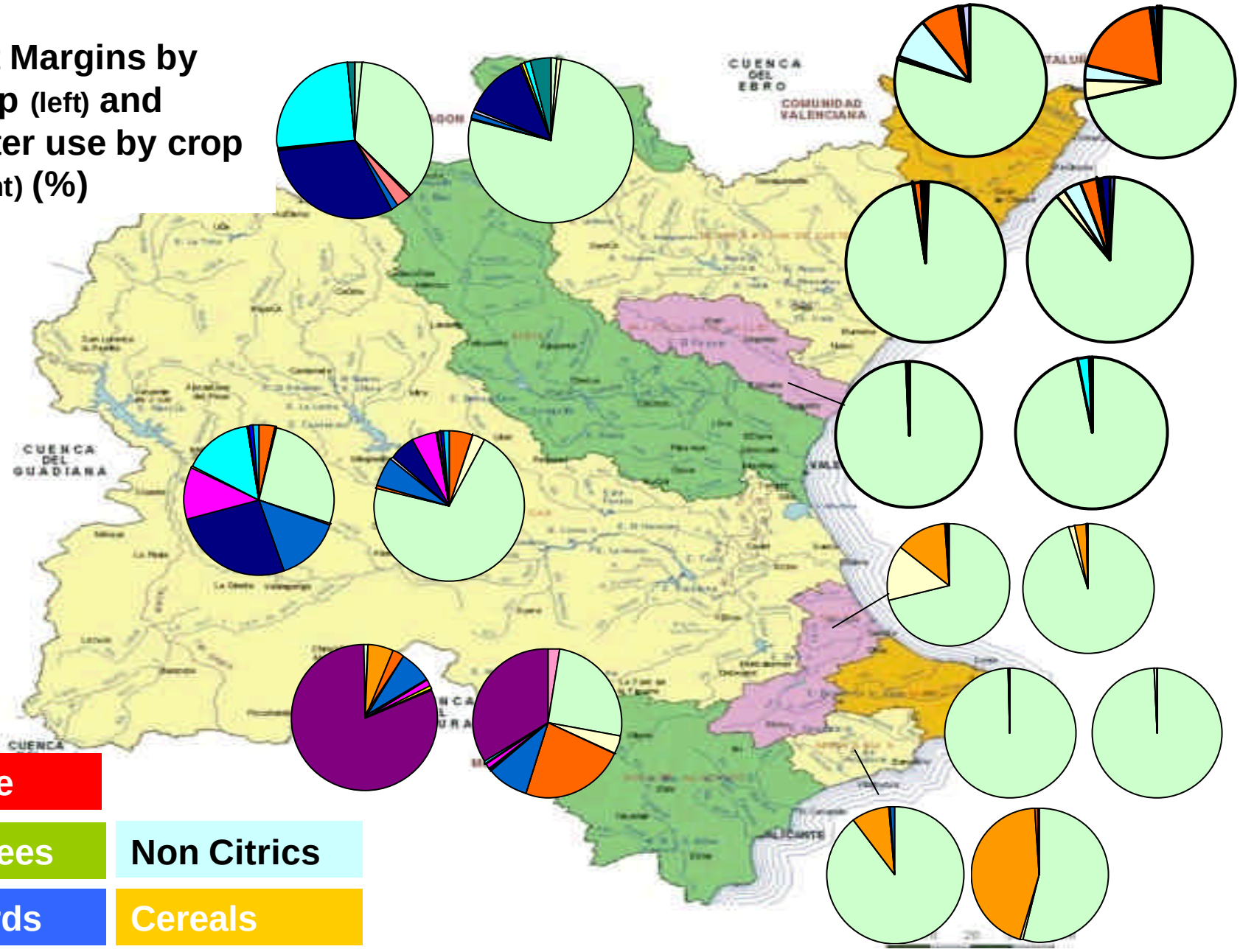


Pipes

Protected open channels

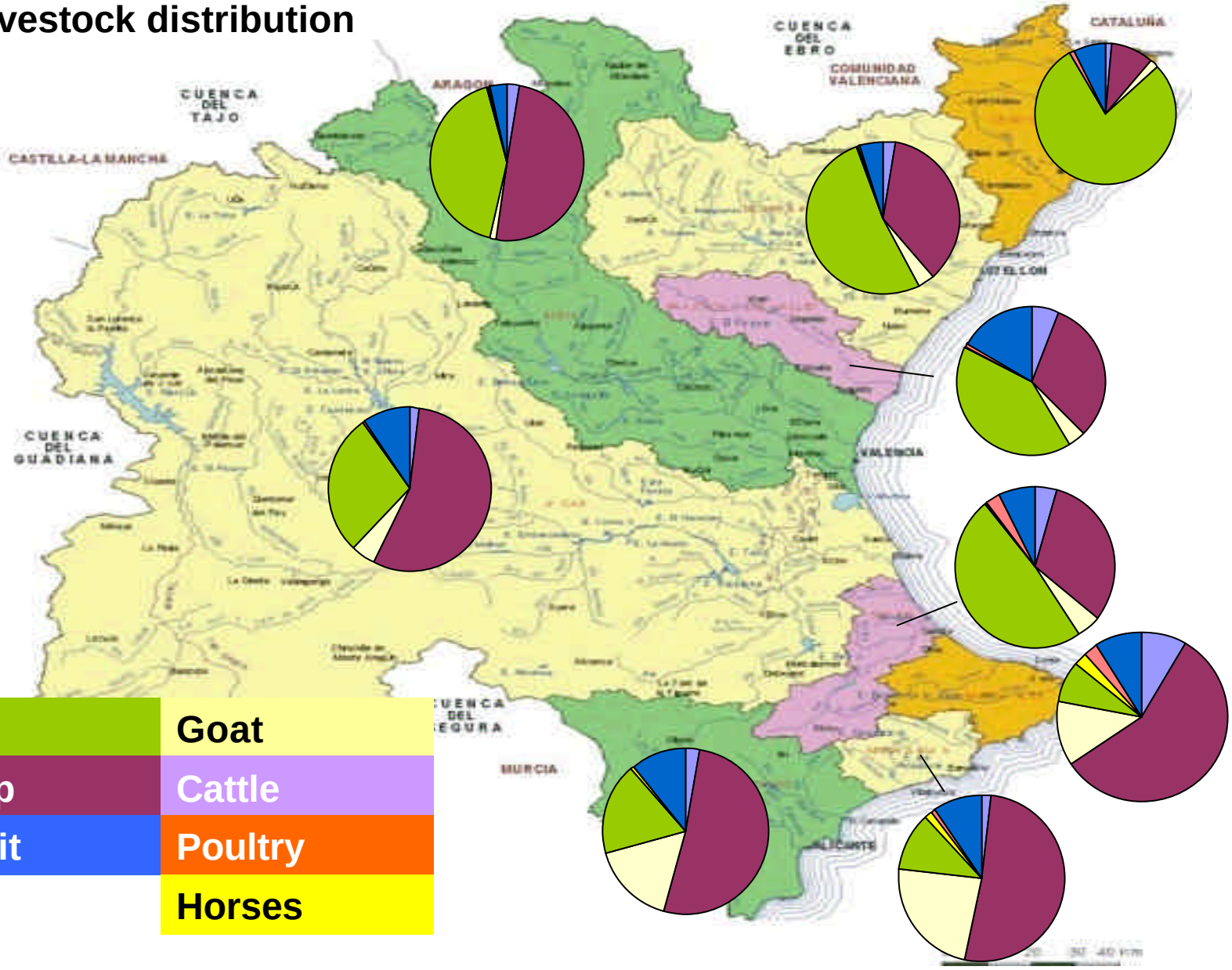
Non protected

Net Margins by crop (left) and water use by crop (right) (%)

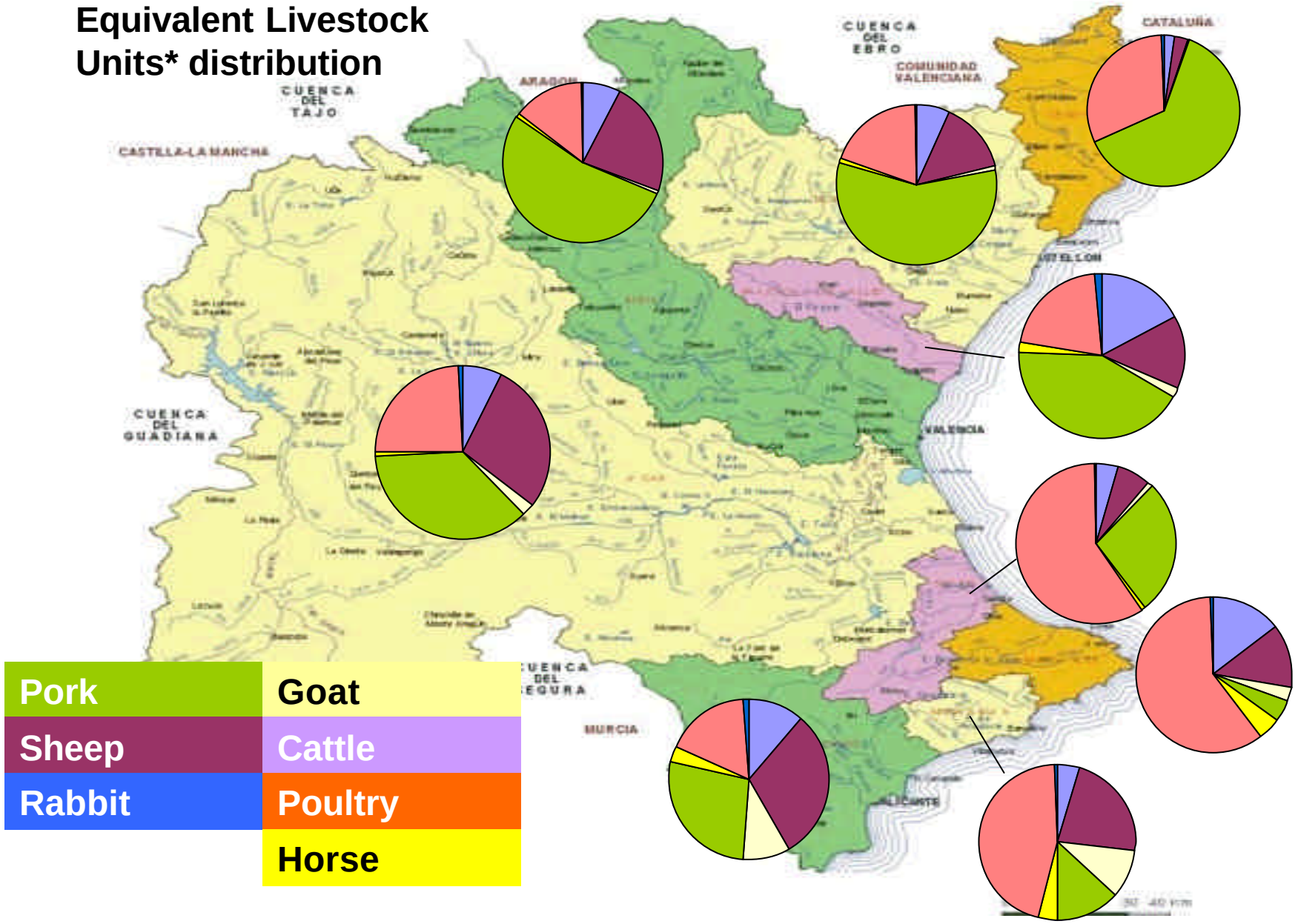


Produce	
Olive trees	Non Citrics
Vineyards	Cereals
Citrics	Rice

Livestock distribution



Equivalent Livestock Units* distribution



*1 ELU = 1 cow

Livestock distribution

UGE	Cattle	Sheep	Coat	Pork	Horse	Paultry (mil)	Rabbit
9001	7.042	48.018	10.375	386.352	542	5.602	36.314
9002	11.735	166.548	15.049	239.309	1.153	2.707	22.385
9003	2.862	14.996	1.958	19.484	231	275	7.962
9004	14.499	292.002	9.311	248.343	854	1.868	21.177
9005	27.836	737.907	63.855	378.811	2.872	6.779	122.774
9006	1.292	9.566	1.557	14.621	185	958	2.179
9007	1.217	8.286	1.747	1.188	358	415	1.272
9008	188	6.018	2.763	1.351	136	111	1.102
9009	2.850	54.197	16.654	18.913	722	254	11.041
Total	69.521	1.337.537	123.270	1.308.372	7.052	18.970	226.207

Farms with and without land (%)

UGE	No land	With land
9001	5166	171964
9002	11487	106810
9003	1365	9251
9004	37311	88910
9005	61449	201623
9006	3886	11116
9007	1327	4831
9008	510	2255
9009	2255	15531
Total	124752	612289

Pending

- Constrast with other information sources.
- Validation of analysis.
- Report on information reccommendations.
- Report of data requirements for different methodological approaches.