



## REPORT

### **D4.1 Activities report:**

**Report on raising public participation and awareness including design of uptake and capacity building activities**



Title:
D4.1 Activities report: Report on raising public participation and awareness including design of uptake and capacity building activities
Authors: Susan Baggett; Geoffrey D Gooch
Report No.
LAGOONS Report No. D4.1
This report should be cited as:
Lagoons 2014. Activities report: Report on raising public participation and awareness including design of uptake and capacity building activities. LAGOONS Report D4.1, 61pp.
Organisation name of lead contractor for this deliverable:
Centre for Water Law, Policy and Science, University of Dundee, Dundee, Scotland, UK
No. of pages: 61
Due date of deliverable: March 2014
Actual date of deliverable: July 2014
Dissemination level
PU
Keywords: public participation, stakeholders, participatory tools, capacity building, scenarios

**Title of project:** *Integrated water resources and coastal zone management in European lagoons in the context of climate change*

**Instrument:**

**Contract number:** 283157

**Start date of project:** October 2011

Duration: 36 months

**Disclaimer**

*The information provided and the opinions given in this publication are not necessarily those of the authors or the EC. The authors and publisher assume no liability for any loss resulting from the use of this report.*

## Acknowledgments

The following are gratefully acknowledged here for organising and running the Focus Groups the Citizens' Juries and/or the final stakeholders' workshops and collecting, recording, translating and reporting the participants' input and deliberations (including maps participants produced) in the following CSAs:

- Mar Menor - Carolina Bello, Javier Lloret, Arnaldo Marín and Carlos Sanz. Assistant - Santiago Campillo Brocal.
- Ria de Aveiro – Fátima Alves, Ana Lillebø, João Soares and Lisa Sousa. Assistant – Eduardo Oliveira.
- Tyligulskyi – Elena Katerusha, Valeryi Khokhlov, Iuliia Tomashpolska.
- Vistula - Małgorzata Bielecka, Anna Reda and Grzegorz Różyński (LAGOONS project); Joanna Przedzimirska (ARCH project);

Last but not least – we are also very grateful for the enthusiasm of the participants who took part.

Cover picture provided by the Mar Menor CSA members.

---

<b>1. Introduction</b>	<b>2</b>
<b>2. Preliminary stakeholder and social group mapping</b>	<b>2</b>
<b>3. Focus Groups</b>	<b>3</b>
3.1 Why focus groups were used as an initial form of engagement	3
3.2 Project members' training and preparation prior to Focus Groups	3
3.3 Identification of focus groups per lagoon	3
3.4 Focus groups - location and type per lagoon	4
3.5 Resources used for focus group meetings	4
3.6 Focus group data collection and tabulation	5
3.7 Location of main aspects identified	6
3.7.1 <i>Ria de Aveiro</i>	6
3.7.2 <i>Mar Menor</i>	10
3.7.3 <i>Tyligulskyi</i>	13
3.7.4 <i>Vistula</i>	17
3.8 FG output transcribed to DPSIR tables	19
3.9 Focus Group outputs - contribution to next step in LAGOONS participatory process	21
<b>4. Citizens' Juries</b>	<b>22</b>
4.1 Project members' training and preparation prior to conducting CJs	22
4.2 Citizens' Juries conducted in CSAs	23
4.2.1 <i>Location and participants of CJs conducted</i>	23
4.2.2 <i>Resources used for CJ meetings</i>	24
4.2.2 <i>CJ data collection and analysis</i>	24
4.4 CJ outputs - contribution to next phase of LAGOONS' participatory process	24
<b>5. Qualitative scenario storylines construction and their quantification</b>	<b>25</b>
5.1 Qualitative scenario storylines	25
5.1.1 <i>Mar Menor</i>	25
5.1.2 <i>Ria de Aveiro</i>	28
5.1.3 <i>Tyligulskyi</i>	31
5.1.4 <i>Vistula (PL side only)</i>	33
5.2 Translating storylines into data	36
<b>6. Final workshop</b>	<b>37</b>
6.1 Preparation work by UoD for workshop training day and input into final stakeholder workshops	37
6.2 Final workshop training day for project members	37
6.3 Outputs of final workshop	38

---

<b>7. Summary</b>	<b>38</b>
<b>References</b>	<b>39</b>
<b>Appendix I Focus group meetings</b>	<b>45</b>
<b>Appendix II Citizens' Jury training days</b>	<b>47</b>
<b>Appendix III Schedule for final stakeholders' workshops</b>	<b>49</b>
<b>Appendix IV Supplementary quantitative data sets for qualitative storylines</b>	<b>51</b>

## Summary

The main concept underpinning the LAGOONS project was that knowledge produced via different scientific disciplines needed to be combined with local knowledge and stakeholders' views in order to produce integrated, participatory scenarios (supplemented by science modelling inputs) of possible future trends and conditions in coastal lagoons. For the duration of the LAGOONS project local participation and input was sought through active engagement of stakeholders (and policymakers) via a three stage participatory process (namely: focus groups; citizens juries; scenario workshops) in each of the four case study areas (CSAs). Ultimately, LAGOONS facilitated the consideration of the project's scientific results, local community and overall policy interests in the formation, evaluation and adjustment of the integrated scenarios created to assess future management and policy options for the CSA in question.

This report specifically addresses the main steps taken by WP4 in order to achieve appropriate levels of participation and input into the formation of integrated scenarios for each of the CSAs, including:

- Preliminary stakeholder and social group mapping.
- Training days conducted by WP4 for CSA project members.
- Process and outputs of Focus Groups.
- How the information generated from the focus groups contributed to the next step in the participatory process.
- Process and outputs of Citizens' Juries.
- How the data generated from the FGs and CJs contributed to formation of the qualitative scenario storylines and their subsequent quantification for scenario modelling.
- Preparation work for final stakeholder workshop.
- Process and inputs for final stakeholder workshop.
- Discussion and Summary.

**Note:** The associated WP4 report (LAGOONS 2014, Deliverable 4.2 Final Scenarios) provides in-depth detail on the final scenarios formed and used at the final workshop, based on the activities and outputs reported here in this report.

---

# **1. Introduction**

The basic concept driving the LAGOONS project was that to produce highly relevant qualitative and quantitative scenarios in the context of climate change and integrated management of the Case Study Areas (CSAs) they should be based on the integration of scientific knowledge and stakeholder input. The scenarios formed from the integration of these inputs were then used to explore and recommend possible future management and policy options for each of the four CSAs (see also other WP4 report: LAGOONS 2014 D4.2 Report Final Scenarios).

Stakeholder input was achieved through their engagement in three consecutive forms of active participation – Focus Groups; Citizens' Juries; Final stakeholder workshop. The reasoning here behind the sequential engagement and inclusion of local participants in these participative and capacity building activities was that local inclusion can be beneficial to: increasing knowledge provision, exchange and creation; understanding and resolving or finding possible solutions to local issues regarding the future management of the CSAs.

CSA Project members' (who were predominantly biologists, ecologists and modellers of the physical environment, except for Aveiro team that also included spatial planners) were also provided thorough training by University of Dundee (WP4) on how to conduct and run the participatory processes used during the project. University of Dundee produced and ran a number of training days for the benefit of the CSA members on (i) how to plan and conduct the participatory processes (Focus Groups; Citizens' Juries; Final Workshops) used during the project; (ii) proposed content and layouts for the final scenario posters and contents of the final stakeholder workshops. Details of the training days are also provided within the body of the following report and associated appendices.

Translated transcripts of the participatory processes conducted were studied and analysed by WP4 who used the evaluated qualitative data: to further the formation of the qualitative scenario storylines; as a basis for the quantitative socio-economic and land use data input used to reflect and complement the changes depicted in each scenario storyline and subsequently provided to the project's quantitative modellers (Bioforsk and UAVR, WP5 and WP6).

## **2. Preliminary stakeholder and social group mapping**

A preliminary stakeholder and social group mapping exercise was conducted in order to aid identification of the respective key stakeholder groups (e.g. fisheries groups, community based organisations, farmer associations, industry representatives, conservation groups) within each of the four CSAs. The information was collected via two main routes: (i) a desk top literature study; and (ii) further guided and reviewed by feedback and suggestions of who to include in each of the four CSAs by the CSA partners due to their familiarity with the area. This document served as a starting point for the further investigation of whom the main stakeholder groups were per CSA and why.

---

### **3. Focus Groups**

#### **3.1 Why focus groups were used as an initial form of engagement**

Focus groups were the first form of active stakeholder engagement used during the LAGOONS project to ensure stakeholder involvement in the project and gain preliminary views. A focus group may, in the context of a lagoon, have a common interest as they are either residents living within particular vicinities on the shores of the lagoon or may have a common but also specific interest, as in the case, for example, of fishing, agriculture, conservation, business or tourism (Baggett et al, 2013). Therefore several focus groups were held in each of the four case study areas to elicit views from a broad set of CSA stakeholders.

Holding several different but highly relevant focus groups within the vicinity of each lagoon was the first step in the project's participatory sequence; in such a setting eliciting and exploring views expressed, by highly relevant and recognised stakeholders, in relation to a given lagoon provided further insight into the possible drivers of change in the locality. This initial form of 'opening up' information via focus groups helped identify which, in the participants' minds were: the main features of the lagoon and any concerns regarding any issues or problems they had identified in relation to the lagoon, where they might be located and if so what future changes, if any, they would like to see in place (Baggett et al, 2013).

#### **3.2 Project members' training and preparation prior to Focus Groups**

University of Dundee produced and ran a number of training days for the benefit of the CSA members. The Focus Group two day training session was held in Madrid, Spain in February 2012. The initial day was run by Joanna Chrzanowska, a fully qualified trainer in focus groups and Fellow of the Market Research Society in conjunction with University of Dundee. The two days provided opportunity for participants to: understand the reasoning behind conducting focus groups; how to conduct focus groups, both in theory and through practical sessions where 'trainees' had ample opportunity to enact both moderating and being part of simulated focus groups.

During the afternoon of the second training day CSA members were provided opportunity to discuss and plan the forthcoming focus groups to be held regarding: presentation of project rationale to focus group participants and content of kick off questions; who the focus group participants should be and how many groups to conduct; dates, logistics and resources required.

#### **3.3 Identification of focus groups per lagoon**

A number of focus groups were held in the vicinity of each lagoon, aimed at particular groups or associations of people (e.g. fishermen, farmers, residents, ecologists) whose participation and input at this stage of the project's participatory process had been identified as important in order to gain their point of view on aspects of the CSA in their vicinity. The type of focus group participants engaged were identified via the preliminary stakeholder and social group mapping exercise and the importance of engaging them at this point in the process confirmed by CSA partners familiar with the study area in question.

---



### 3.4 Focus groups - location and type per lagoon

Each focus group was conducted within the participants' locality, in a setting where they would be comfortable discussing the focus group's stated purpose. The number, location and type of focus groups held per lagoon were as follows:

- Aveiro = 9 (residents; students/researchers; council members; recreational hunters and fishermen; mixed activity; fishing sector; waterway transport shipping; harvesting of marine salt, reed etc.).
- Mar Menor = 6 (ecologists; seniors; students/researchers; business owners, fishermen; farmers and stockbreeders).
- Tyligulskyi = 8 (farmers; fishermen; hunters; landscape park employees; Odessa residents; tourists and tourist sector employees)
- Vistula (PL only) = 6 (teachers; fishermen; hotel owners/operators; gastronomy sector; local authorities; social activists).

### 3.5 Resources used for focus group meetings

The focus groups held in the four CSAs were set up and conducted in a comparable way and included the use of the following resources (see also Appedix I for information provided by members of each CSA on how they directed their focus groups):

- A moderator and facilitators.
  - Written materials were distributed and in some cases PowerPoint presentations on the project were used during the focus groups, which provided information for the participants on the LAGOONS project's goals, website and activities.
  - Warm up/open questions – depended on the group in question; flexibility was essential. Some groups were very eager to initiate discussion once they understood the reasons for asking for their involvement and opinions.
  - Following the methodology proposed by the team of the University of Aveiro, namely Fátima Alves, FG also included maps for spatialisation and visualization of the results. Maps of the CSA lagoon – stickers were provided for the participants to signify areas on the map which they viewed as either a positive aspect (green sticker) or an area of notable concern (red sticker) within the lagoon area. Some used yellow markers to denote the location of the focus group. These participatory methods were already used by UAVR team, namely in the scope of local Agenda 21 activities and are being used in the scope of the Ovar-Marinha Grande coastline management plans (POOC) activities.
  - Recording and collection of focus group data – audio recordings were made with notes taken simultaneously.
-

### 3.6 Focus group data collection and tabulation

The data collected and recorded by the project's CSA members from the subsequent deliberations of the participants of each focus group held within each lagoon were summarised and then translated from their original language into English. The following excerpts are examples of the content of the text originating from the translated summaries provided per CSA:

- Aveiro (participants involved in different activities): *"the involvement of ordinary citizens in the activities of management and development of Ria is very important for their pedagogical nature"... "the problem that gathered more consensus among participants was the strong currents that are felt in the channels of the Ria de Aveiro. The increased velocity of water causes the disappearance of some species of fish, seagrasses and reeds, giving rise to silting and destruction of the seabed of the Ria"*.
- Mar Menor (ecologists/researchers): *"In terms of future they suggest a better management of the urban develop, for... Mar Menor is already overcrowded and there is no need to build. They also suggest a change in the production systems, the agriculture, which is now based in irrigation; this always have been a land of dry crops, and that carries several problems"*.
- Tyligulskyi (hunters): *"Illegal sand mining is still one of the most important factors affecting the faunal diversity (and not only). ... There is a structural unit of the regional environmental agency in Kominternivskyi district, but there is no sufficient forces and means at his staff to stop the chaos there (as well as that of the 3-4 workers)"*.
- Vistula (local authorities and female social activists): *"Water (In the lagoon) is dirty. Even though field fertilizing is less intensive and the resultant influx of nutrients went down considerably, the water starts blooming in mid-July, so bathing is no longer possible and beaches grow empty... Flood management of the lagoon is inadequate and wrong; in case of backwatering (storm surge) Tolkmicko, Suchacz, Elbląg are flooded. Better flood protection is required. In the 70s drainage ditches were cleaned regularly – nobody gives a damn about it nowadays! "*.

All the translated focus group material originating from each CSA was further considered and analysed by the University of Dundee project team to assess what the main messages were from the individual focus groups, based on an agreed set of open questions/topics to be incorporated into the discussions during the focus group sessions.

The next two sections present firstly, the details of the maps generated via the focus groups and subsequently the DPSIR tables produced from the focus group data. The importance of the *initial* data tabulation exercise cannot be overstated and should be read in conjunction with the map figures and DPSIR tables presented here to fully understand the overview gained from the whole process.

---

### 3.7 Location of main aspects identified

Following the proposed methodology by UAVR, at the end of each focus group session the participants were asked to identify on a map of the lagoon, via the use of stickers, areas of notable concern (red stickers) and areas of positive aspects (green stickers) in relation to the lagoon. This spatial analysis consisted of a clustering of the positive (green spots) and less positive aspects (red spots) for each session as shown in the following figures per lagoon. Yellow or orange markers on the maps were used to denote the location of the focus group.

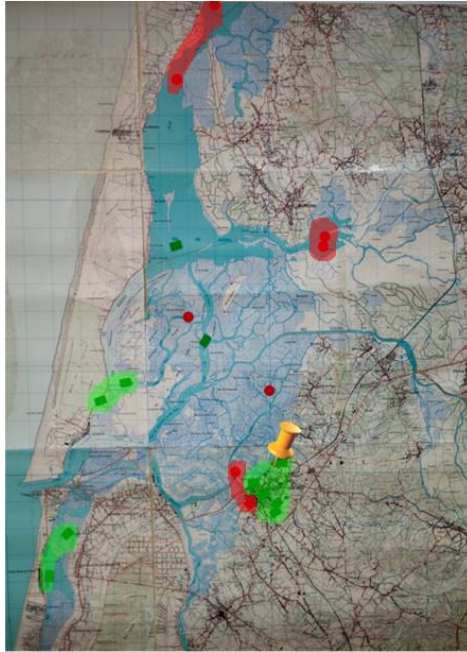
#### 3.7.1 *Ria de Aveiro*



PARISH OF GLÓRIA



UNIVERSITY OF AVEIRO



**PARISH OF VERA CRUZ**



**PARISH OF SÃO JACINTO**

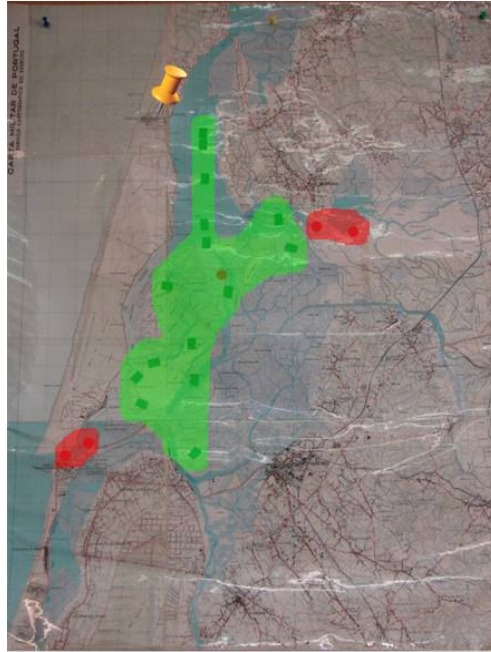


**PARISH OF GLÓRIA (2)**

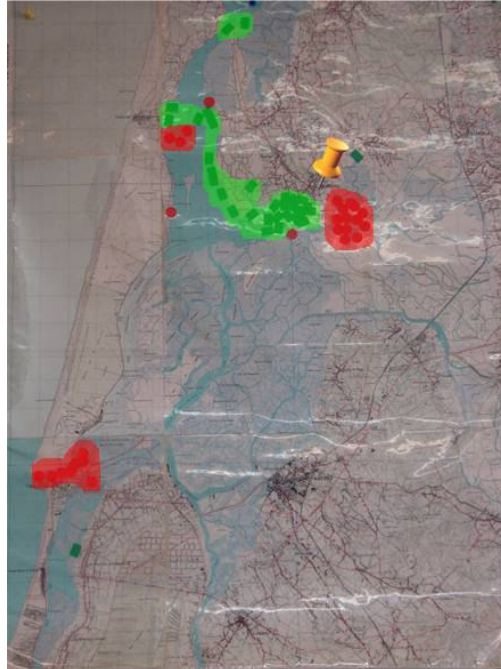


**PARISH OF GAFANHA DA ENCARNÇÃO**





**PARISH OF TORREIRA**



**PARISH OF MURTOSA**



**ASSOCIATION OF HUNTERS AND FISHERMEN OF AVANCA**

### ***3.7.2 Mar Menor***



**Mar Menor – Senior**



**Mar Menor – Business**



**Mar Menor – Ecologist Association**





**Mar Menor - Students**

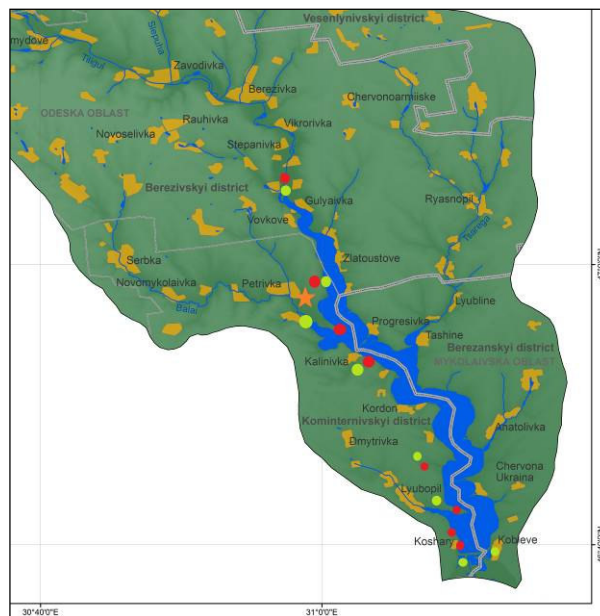


**Mar Menor – Agriculturalists**

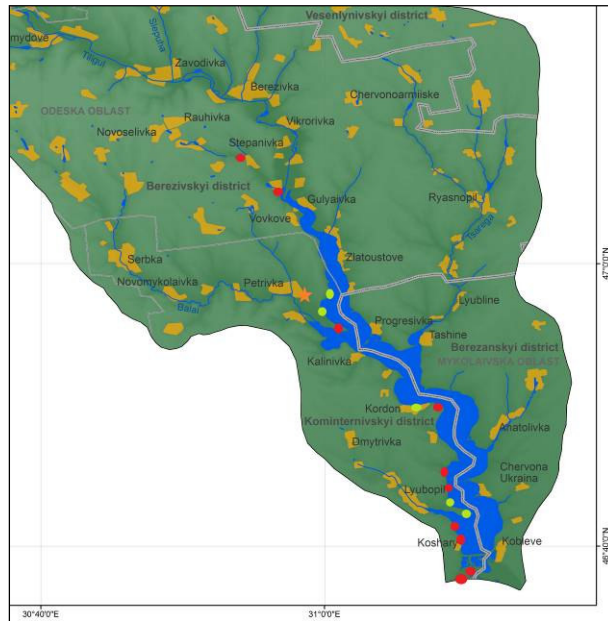


**Mar Menor - Fishermen**

### 3.7.3 Tyligulskyi



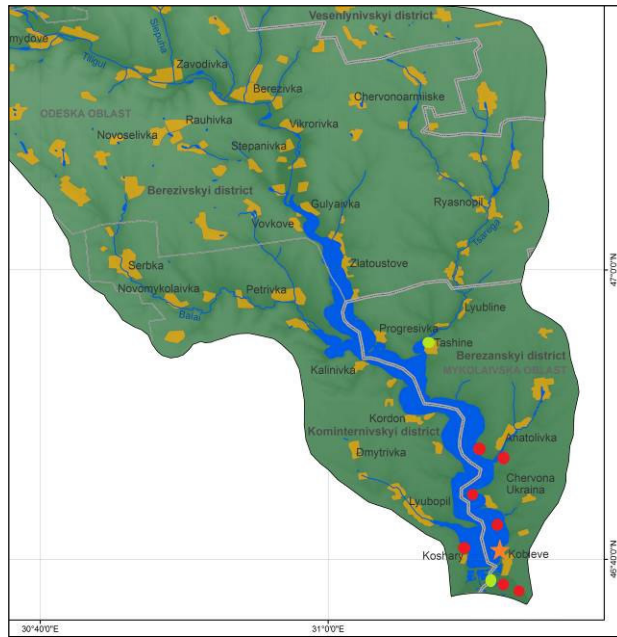
**Farmers - Odessa**



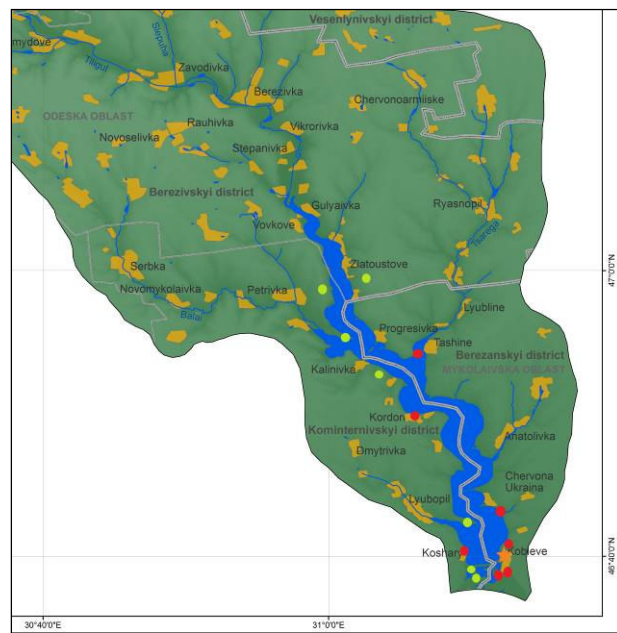
**Residents Odessa**



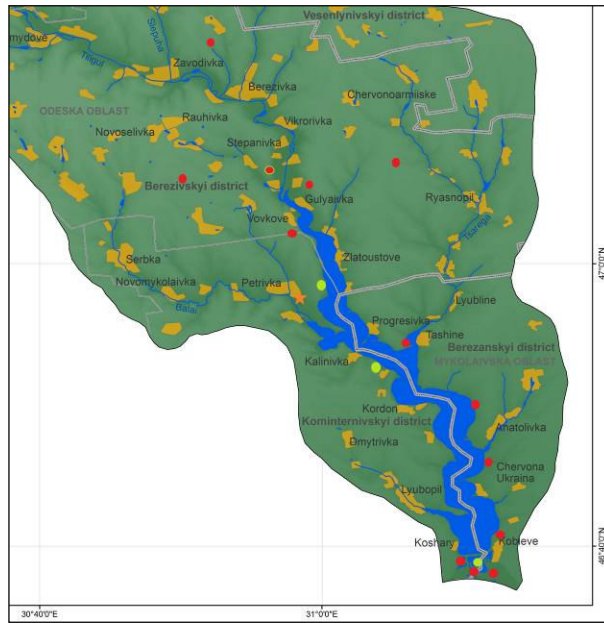
**Farmers Mykolaiv**



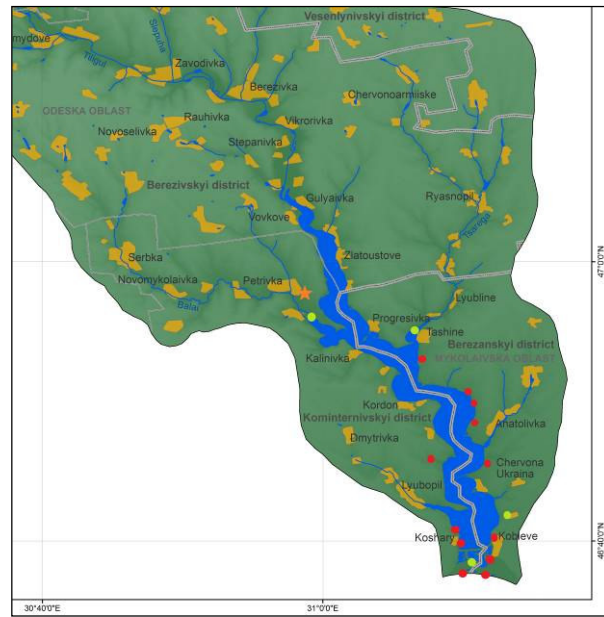
**Residents Mykolaiv**



**Landscape park employees**



**Hunters**



**Fishermen**



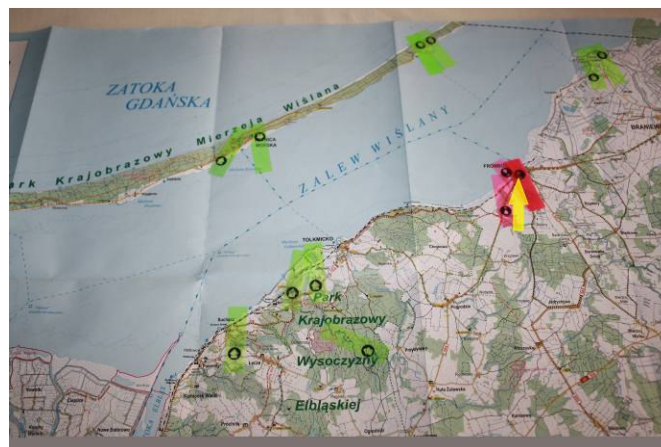


**Tourists**

### 3.7.4 Vistula



**Frombork fishermen**



**Frombork gastronomy**



Frombork teachers



Kadyny



Krynica Morska

### 3.8 FG output transcribed to DPSIR tables

The following (Table 1) is an analysis and transcription of all the qualitative information by the University of Dundee, (originating from the interactions and deliberations of the focus groups held per lagoon, as presented in Appendix I), into a DPSIR table per lagoon providing loose aggregates accumulated under each column heading. This analysis of the FG meetings content was carried out by University of Dundee in collaboration with the case study teams, in order to identify: the relevant driving forces present and their overall influence on each of the lagoons; the participants' main concerns and what they suggested as a response or responses to improve or rectify those concerns.

Driver	Pressure	State	Impact	Response
<b>Ria de Aveiro</b>				
Economy	Dredging of channels;	↓ Seagrasses	↓ Traditional employment/activities	Better overall regulation, law enforcement
Fishing/shellfish	Sediments dynamics (erosion and deposition)	↑ Pressure on fish/shellfish	↑ Parallel economy	Improve the procedures related to the monitoring of biotoxins and lead
Tourism		↑ Bait digging	Variability in income for local populations	
Port activities		Impoverishment of sediments bed	Management conflicts	
Downturn	Water velocity			Unique local management structure
Climate	Salinity of land; surface salt water intrusion.	↓ Reeds	Invasive species impact in the lagoon environment and local economy	Improve active public participation
Uncoordinated management	↓ Investment in infrastructure	↑ Siltation of smaller channels	Changes on seagrasses beds ('moliço') and hydrology	Stimulate stakeholders and end-users engagement
Traditional activities	Illegal fishing gears	↑ Erosion of margins		High-end/ sustainable tourism including traditional activities
Agriculture	Competition between harbour interests and local fishermen interests	↑ Water quality status	↓ Seagrasses nursery function	Better overall promotion of area and product labelling
Recreational hunting and fishing activities	Professional fisheries vs low vigilance of recreational fisheries	Change in tidal high	Sense of isolation	Appropriate development of sustainable infrastructure/transportation
		↑ Water velocity	Loss of agriculture land	Integration of local fishermen and port interests
	Historical industrial pollution (e.g. Largo do Laranjo and Largo da Coroa)	↓ Traditional activities	↑ Air temperature in Avanca	Structures to control the currents and water velocity
		↑ Health state of the bivalves	Impact of cormorants in freshwater aquaculture farms;	Increase the role of the University of Aveiro
	Temporary ban on shellfish harvesting due to the presence of	↓ Public transports (ferry and speedboat)	Excess growth of <i>Eichhornia crassipes</i> , commonly known as Common Water Hyacinth in freshwater channels;	Conclude the Baixo Vouga dike
		Salinization of cultivate fields		Promote the balance between freshwater and saltwater
		↓ Number of		



	biotoxins ↑ Unemployment of local populations Invasive species ↑ Motorboats ↑ Price of drinking water	specimens for recreational fishing and hunting activities Environmental imbalance due to mismanagement	Impact of large colonies of storks on the prey populations.	Restoration and cleaning the small drainage channels Recovery of ancestral activities related to farming and recreational hunting and fishing activities
--	---	---	---	---

### Mar Menor

Economy Intensification and development Ecology – biodiversity (??) Uncoordinated or absent management	Mass tourism / watersports High boat numbers Massive urbanisation Lack of Wastewater treatment (WWTP)/increase in WW Increase in illegal fishing/unethical competition.	↓ Water Quality Agricultural runoff /direct discharge Amount of WW ↓ various spp. e.g. 'chapinas' (little clams). Phreatic level/heavy rains carry nutrients/chemicals into lagoon	Non-native species Algal blooms Eutrophication Jellyfish – increased numbers and type of spp. Poor all round management Impact on existing tourism Overcrowding/overuse Environmental degradation Lack of enforcement of control and regulations.	High-end tourism Better control of development Reopen channels Traditional uses WWTP Improve/integrate management and regulations Agricultural controls
---	---	--	---	---

### Tyligulskyi

Ecology (pristine) Social/economic Low investment Lack of policy/planning Climatic change	Agricultural runoff Slow intensification of agriculture and livestock management Deforestation Recent changes in weather Channel restoration / water exchange	Deterioration of water quality Deterioration of ecological condition	Ecosystem services ↓ Hunting ↓ Eutrophication Unlawful use of park Coastal erosion Illegal sand mining Ecological decline Periodic fish kills Changes in type of fish	HHW and WWT improvements Development regulation and control High end/sustainable (eco)tourism/recreational activities e.g. ornithology Develop agricultural sector and fishing in a controlled and sustainable way Hunting to continue but in well managed and
---	---	---	---	--

	Unregulated development		species seen	monitored way.
	Fishing/poaching		Lack of environmental protection/enforcement	Environmental management and enforcement
	HH waste /WWT		Competing views on park use	Maintain as coastal ecological corridor
	Pollution (industrial?)		Competing views on channel	
<b>Vistula*</b>				
Economic	↓Infrastructure for transport, fishing industry, sustainable tourism	↓ Fish -	Poor infrastructure / facilities	Better and coordinated regulation (PL inter-municipal and PL-RU transboundary)
Social		e.g. ↓ Eels	Lack of, or inappropriate, maintenance or conservation	Local administration more coordinated and less biased; improve local communication and participation.
Low investment or promotion	Authorities - Inter-municipal competition	↓Water quality*	Illegal dumping	Fish (particularly eel) stocking - jointly with RU?
Fish stocks	Competition from Russia		High outflow of people – particularly younger skilled generation	To retain tourists longer
Regulatory imbalance/poor communication between PL/RU e.g. Fisheries	Lack of jobs		Decline in agro-tourism/tourism	Restoration/protection of local historical and natural/ecological attractions
Poor/irregular local administration (soft infrastructure)	Cormorants?		Mainly only day tourists	Infrastructure investment – e.g. transport, cycle paths, tourist information, harbour facilities
Unequal development	Regulatory limitations		Algal blooms	
Tourism			Impact of S22 road on PL side to RU border	
			Possible cross cut	

**Table 1 DPSIR tables formed by WP4 based on LAGOONS focus group data**

\*Note regarding Vistula (from Greg Różyński, IBW PAN) “water quality will never be crystal clear in VL because of the nature of its bottom and the uptake of nutrients from it even though their influx has been reduced by treating sewage and reduced use of fertilizers”.

### 3.9 Focus Group outputs - contribution to next step in LAGOONS participatory process

The next step in the LAGOONS project’s participatory process was in the form of citizens’ juries. Based on the format used for criminal courts in the UK or US, citizens juries essentially consist of 12-24 randomly chosen citizens who hear the evidence presented by a range of supposed ‘witnesses’ who are all experts in their particular field. The witnesses each present their case, to the jury, regarding their specific interest or aspect of concern associated with the (in this case) lagoon in question, which may be a competing or conflicting

interest in relation to the other witnesses present. The jury can also question the witnesses. After all the evidence was presented members of the jury were provided time to think individually about the evidence provided by each of the experts and also deliberate amongst them, before presenting their 'verdict' back to the witnesses and the moderator. The 'verdict' provided by a citizens' jury, based on the information presented to them by the expert witnesses, are informed choices regarding policy matters, unlike the verdict provided by juries in a court of law, where the verdict is either guilty or not guilty.

The contents of the focus group report was used to make an informed choice on the following elements required for the next step in the project's participatory process i.e. citizens' juries:

- The relevant driving forces and their influence on each of the lagoons.
- The fields of expertise that needed to be addressed and represented during the citizens' juries per lagoon.

## **4. Citizens' Juries**

The second form of stakeholder engagement used during the LAGOONS project was in the form of Citizens' Juries (CJs), a method of engagement and deliberation which is based on the format used for criminal courts in the UK or US. Citizens' juries essentially consist of 12-24 randomly chosen citizens who hear the evidence presented by a range of supposed 'witnesses' who are all experts in their particular field. The witnesses each present their case, to the jury, regarding their specific interest or aspect of concern associated with the (in this case) lagoon in question, which may be a competing or conflicting interest in relation to the other witnesses present. The jury can also question the witnesses. After all the evidence has been presented members of the jury are provided time to think individually about the evidence provided by each of the experts and also deliberate amongst them, before presenting their 'verdict' back to the witnesses and the moderator. The 'verdict' provided by a citizens' jury, based on the information presented to them by the expert witnesses, are informed choices regarding policy matters, unlike the verdict provided by juries in a court of law, where the verdict is either guilty or not guilty.

In this instance the jury was asked to consider the future development of the lagoon in the next 15-20 years and to provide a series of recommendations in an attempt promote the future development of the lagoon according to the jury's criteria.

### **4.1 Project members' training and preparation prior to conducting CJs**

A two day Citizens' Jury training workshop, prepared and led by the University of Dundee and hosted by PIK in Potsdam, Germany was held on the 29<sup>th</sup>-30<sup>th</sup> January 2013, in preparation for conducting the CJs in the CSAs. Details of the materials used and content of the training workshop are provided in Appendix II. This training session provided CSA project members the opportunity for:

---

- Learning how to run, moderate and record a CJ meeting in their CSAs.
- Enactment of process and deliberations during a CJ by CSA project members, using a fictitious lagoon (named 'Lagoonio') around the subject areas likely to be considered during each of the CJs.
- A final session, also headed by University of Dundee, allocated for planning the forthcoming CJs per CSA including: the focal question to be put forward to the jury to assess and provide recommendations for; selecting and assembling the jury; which topics needed to be covered by expert witnesses; dates when CJs to be held and resources required.

## 4.2 Citizens' Juries conducted in CSAs

### ***4.2.1 Location and participants of CJs conducted***

Each CJ was conducted within the participants' locality, in a setting where they would be comfortable discussing the CJ's stated purpose. The location and type of the four CJs held were as follows:

- **Ria de Aveiro**  
The CJ was held at INATEL, Santa Maria da Feira on 6<sup>th</sup> and 7<sup>th</sup> of April 2013. Participants in the CJ consisted of four women and eight men, aged between 25 and 70 years, most of which originated from and were residents of civil parishes that encompass the Ria de Aveiro. The remaining participants lived and worked in the region for over two decades.
  - **Mar Menor**  
The CJ meeting was held on 8<sup>th</sup> and 9<sup>th</sup> of March 2013 in the meeting room of the Sports Centre Sports Complex in Playa Paraíso, address: Calle Humilce, s / n, 30385 Cartagena, Murcia. The jury was composed of 14 people linked to the Mar Menor with concerns in the state and sustainability of the Mar Menor and its surroundings. The jury was selected on the basis of different ages and educational levels and with representation of both genders, in order to embrace the diversity of the population of that area.
  - **Tyligulskyi**  
The meeting was held on the 19<sup>th</sup> - 20<sup>th</sup> April 2013 in the village of Koblevo, Mykolaiv region, Ukraine. The jury consisted of 12 people, the expert team was represented by eight participants. The CJ included residents of Odessa and Mykolaiv regions from all districts of the area of interest, namely Berezansky, Kominternovsky, Berezovsky; the following localities: Berezanka, Kalynivka, Krasnoarmeyka, Tashino, Pshenyanovo villages, town of Koblevo, Yuzhniy city. Age category of the members of the Citizen jury was 23-60 years. Gender ratio: 70% - men, 30% - women.
  - **Vistula (PL only)**  
The meeting was held at Kadyny on the Vistula Lagoon on the 5<sup>th</sup>-6<sup>th</sup> April 2013. There were 12 jury members originating from different areas within the Polish part of the lagoon.
-

#### ***4.2.2 Resources used for CJ meetings***

The CJs held in the four CSAs were set up and conducted in a comparable way and included the use of the following resources:

- A moderator and facilitators.
- Presentations by a number of expert witnesses – topics chosen were dependent on the major drivers identified through analysis of the FG data.
- Map of the CSA lagoon.
- Note taking and collection of CJ data.

#### ***4.2.2 CJ data collection and analysis***

The data collected and recorded by the project's CSA members from the subsequent deliberations of the participants of each CJ held within each lagoon were summarised and then translated from their original language into English.

All the translated CJ material originating from each CSA was further considered and analysed by the University of Dundee project team to assess:

- What the main messages were from the individual CJs.
- How the information and recommendations received through the CJ process further contributed to and expanded on the information received and already analysed via the CSA FGs.
- Use of CJ material to further define, expand or modify the content of the initial scenario storylines formulated after analysis of the focus group material.

#### **4.4 CJ outputs - contribution to next phase of LAGOONS' participatory process**

The final part of the project's participatory process was a stakeholder workshop where the four scenarios per CSA were presented and considered. The contents and outputs from the previous FGs and CJs were used to make an informed choice on the following elements required for the final stakeholder workshops regarding:

- The relevant driving forces and their influence on each of the lagoons.
  - Quantification (WP4) of the qualitative information presented in the storylines (WP4) and their incorporation into the quantitative modelling by the project's modellers (Bioforsk and UAVR, WP5 - catchment and WP6 – lagoons).
  - Continuation of the iterative process for refining, defining and considering the content and aspect of the scenarios.
-

## 5. Qualitative scenario storylines construction and their quantification

The qualitative storylines were constructed by WP4 based on participants' deliberations and input during the focus groups and citizen juries, following the methodology outlined by Gooch and Stalnacke (2006). As stated in the following sections, actual socio-economic and land use statistical data (e.g. Eurostat) available on the Case Study Areas (CSAs) were extracted and manipulated by WP4 to offer tangible quantified changes to complement the qualitative depictions provided in each of the sixteen scenario storylines (four per CSA) as presented in Appendices VI.

### 5.1 Qualitative scenario storylines

The scenario storylines were written and developed by WP4 through qualitative analysis of the content of focus groups and citizens' juries outputs held in the CSAs. The storylines used a matrix of four different possible futures. The aspects of the scenarios were high or low economic development and high or low environmental quality. These were used to produce the following four possible scenarios, termed as:

- Business as Usual (BaU) – describes how the future (in this case 2030) could develop based on known changes and past trends, without any major deviation from present arrangements regarding economic growth or environmental quality.
- Managed Horizons – an alternative future where both economic and environmental factors are positively used to provide tangible human benefits but are co-managed in a way that not only does no harm but may also benefit the environment.
- Set Aside – a future which may not provide direct tangible increases in benefits to the residents of the CSA but may provide indirect economic and environmental benefits to the area predominately through the value of and payment for ecosystem services and through ecological conservation.
- Crisis – where both economic decline and environmental degradation of the study area impact on the well-being and livelihoods of the CSA residents and severely affect any economic, social and environmental recovery of the lagoon.

The following are the scenario storylines written and developed by WP4.

#### 5.1.1 *Mar Menor*

##### **BaU for Mar Menor**

Spain has now been a member of the EU for 44 years. The total resident population of the area has increased by 28% and employment in the area keeps declining, with more than 30% of 15-64 year olds unemployed and very little in the way of employment for the under 25s. Urbanisation and intense development in the form of hotels, apartments and associated holiday businesses continues and the number of holiday bed places has grown by 50%, mainly to cater for the anticipated high influx of tourists, visiting primarily during the summer

---

months. Tourist numbers however, even during peak season (June – August), have only risen by 2% as it is no longer viewed as a prime destination for holidays. Some highly urbanised parts of Mar Menor are still completely abandoned during the winter months, particularly La Manga.

The increased level of wastewater and the lack of wastewater treatment plants to deal with the summer surge of tourists affect water quality. However, it is not the only main factor affecting water quality as indirect discharges due to agricultural runoff and direct discharges into the lagoon via the Albuñón wadi plus the phreatic level/heavy rains also carry nutrients and chemicals into the lagoon, promoting eutrophication and the appearance of algal blooms. This is despite the decline in agriculture area utilised in the area.

While various lagoon species (for example local 'chapinas' little clams) are in decline, jellyfish, both in numbers and type of species have increased (estimate at 2002 was 47 million individuals every summer according to Pérez-Ruzafa et al. 2002) along with some other non-native species. The commercial species in the lagoon are also impacted by illegal fishing and the lack of required monitoring and penalties. These factors along with high recreational boat numbers, particularly motor boats, plus sheer overcrowding of the lagoon at peak season are impacting on existing tourism and leading to further ecological and environmental degradation.

Poor all round management of the area and the lack of coordination between the administrative bodies responsible for the area has been evident for decades. The lack of enforcement of control and regulations within the lagoon further compounds the impact of these pressures on the lagoon and consequently the natural status of the lagoon has deteriorated further. There has only been a 9% increase in total environmental protection expenditure.

### **Managed Horizons for Mar Menor**

The resident permanent population has risen by 10% since 2011 and employment has risen by 15% for 15-64 year olds and nearly 25% for the under 25s. Urbanisation has slowed down drastically with local sustainable planning incentives to refurbish older properties to a high environmental standard (sustainable construction standards such as e.g. BREEAM, CEEQUAL, SKA, and LEED) for mixed use (residential, tourism, shops and services) revitalising existing areas or properties rather than build anew. The total amount of agricultural land available remains unchanged.

While the holiday industry is still a major economic benefit for the area it is much more diverse (e.g. health, wildlife, sports training) attracting a broad set of visitors and whose numbers are dispersed more evenly than before over the entire year, accounting on average for 20% in addition to the permanent resident population. There are a number of low impact eco-paths and cycle routes that link the whole basin. Businesses - both those associated with the tourist industry and other forms of business in and surrounding the lagoon - adhere to and actively promote an agreed environmental and sustainability code/programme for protecting the lagoon. The code/programme is overseen by a dedicated local commission which is answerable to and supervised by a higher body (e.g. the European Union).

Water quality has improved considerably over recent years mainly due to the: increased capability of the wastewater plants; regular monitoring of agricultural runoff with active advice on and enforcement of land management practices if need be; immediate monitoring and remediation of any extra nutrient loads or pollution into the lagoon due to heavy rainfall or raised phreatic levels. The integrated management and planning of natural resources usage

---

in the area includes the use of all forms of water resources, with hefty penalties for illegal water extraction.

Due to increased overall environmental vigilance in and around the lagoon algal blooms are now much less frequent and the number and type of jellyfish species have decreased dramatically while the numbers of indigenous lagoon species have steadily increased. Artisanal fisheries are prominent, well managed and sustainable, with poaching at an all-time low due to strict regulations. The number and type of boats (rowing, sailing, motor) allowed in the lagoon are well regulated and favour non powered vessels, with speed limits in place. Due vigilance and corresponding penalties are applied regarding any illegal fishing and unethical competition. Some land and water based protected areas have only seasonal access. There is a 30% increase in total environmental expenditure.

### **Set Aside for Mar Menor**

The overall population has decreased by 10% and the employment rate has declined by twenty percent. Urbanisation has slowed down drastically with some sustainable planning incentives to refurbish older properties for mixed use (residential, tourism, shops and services) revitalising existing areas or properties rather than build anew. The number of tourist bed places has declined by ten percent. The total amount of agricultural land available has dropped by 15% but is better managed.

Mar Menor lagoon and its surroundings are well managed by the local municipalities and its broad set of local and regional stakeholders (which include the local and regional authorities, business people, agriculturalists, fishermen, ecologists and local residents etc.) which form the local commission. The commission's undertakings are underpinned by an up-to-date environmental and sustainability plan for the area. They meet regularly to review the current status and also see what needs to be updated or further considered and included in the agreed strategic plan focusing on the sustainability of the lagoon. Overall water quality, ecological and economic status of the lagoon and the surrounding area has increasingly improved over recent years mainly due to the joint concerted efforts and actions of the stakeholders involved and the informed public within the locality. The status of these considerations is regularly monitored with the results published and made freely available. Illegal fishing carries hefty penalties and the lagoon is regularly monitored for this.

While overall tourist numbers have declined by 5% tourism in the area has diversified and is spread more evenly over the year. An upsurge in eco and cultural/heritage tourism is attracting a steady number of visitors throughout the year, providing a much higher than usual regular income and more economic security to the region. There are a number of low impact eco-paths and cycle routes that link the whole basin. A number of land and water based designated protected areas have either restricted or no access which benefits the area by providing essential recuperation of natural resources that in turn generate indirect income through the ecosystem services provided to the region. There is a 60% increase in total environmental expenditure.

### **Crisis for Mar Menor**

The overall population in the area has declined by 20% and unemployment is running at 75%, with the majority out of work being less than 25 years of age. Urbanisation and intense development in the form of hotels, apartments and associated holiday businesses has escalated by a further 10% in anticipation of increasing tourist numbers, without any form of control or protection for the lagoon or the surrounding environment. Older buildings or failed

---



developments are left to crumble. The amount of land available for agricultural has dropped by 10% and the area utilized for agriculture has dropped by thirty percent.

The highest influx of tourists is still primarily during the peak summer months, accounting for a twenty fold increase in relation to the local population during peak times. The number of tourist bed places available has increased by 10%; however tourist numbers for the year in total have dropped by ten percent. The area attracts tourists who come predominantly for cheap beach based summer holidays on or near the lagoon. The amount of wastewater and the lack of wastewater treatment plants to deal with the influx of tourists has had a drastic effect on the water quality and led to critical environmental degradation of the lagoon. However, it is not the only factor affecting the water quality and ecological status of the lagoon as unregulated and uncontrolled agricultural runoff and direct discharges into the lagoon along with the phreatic level/heavy rains which also carry nutrients and chemicals into the lagoon, constantly promote eutrophication and the frequent appearance of algal blooms. A number of indigenous and important lagoon species (for example local 'chapinas' little clams) are threatened or extinct, while jellyfish and other invasive species proliferate both in numbers and type of species.

The ecological status is further worsened by the continually increasing rate of uncontrolled and unpunished illegal fishing practices. High boat numbers and the ever increasing overcrowding of the lagoon at peak season is severely impacting existing tourism and leading to continuous environmental degradation and health issues. Poor, uncoordinated or absent all round management and the lack of enforcement of control and regulations within the lagoon further compounds the impact of these pressures on the lagoon. There is a 40% decrease in total environmental expenditure.

### **5.1.2 Ria de Aveiro**

#### **BaU for Aveiro**

Portugal has been a member of the European Union for 44 years. The resident population of Aveiro has increased by six percent. Employment however has continued to slowly decline, with more than one third of 15-64 year olds out of work with the under 25s accounting for more than 60% of the unemployed in the area. Traditional employment and associated activities within the local population also continues to fall. People in the area are more and more reliant on obtaining other forms of employment, but the likelihood of securing another job in a different economic sector due to economic decline is also uncertain. These economic changes are also due in part to the changing hydrological dynamics and increased water velocity within the lagoon which impacts the sea grasses, reeds and the natural and nurturing environment of the lagoon's sea bed and surrounding land and can no longer provide a steady reliable income for local populations. The total area available for agriculture has decreased by 10% since 2009.

Competing demands on the lagoons' resources between the interests of the harbour and the local fishermen is prominent. There is also a high level of concern shown by the professional fishermen due to the impact of recreational fishermen, the use of illegal fishing gears, increasing pressure on fish and shellfish stocks and the long term impact of intensive bait digging. Lack of supervision/monitoring by the responsible entities. Some level of historical industrial pollution in Lago do Laranjo is still present. For specific periods there is a temporary ban again on shellfish harvesting in the entire lagoon area due to the presence of biotoxins produced by harmful algae blooms (HAB)..

---

Environmental and ecological conditions in the lagoon also continue to deteriorate due to the lack of structures to control the currents and water velocity. Failure to finish the Baixo Vouga dike further promotes the erosion of the lagoon's banks and saltwater intrusion of the surrounding land. A number of invasive species (flora and fauna) have established populations within the lagoon, while the natural system of the lagoon and its associated flora and fauna are in decline. Level of investment is low and the overall management of the lagoon and its surrounding areas are uncoordinated between the municipalities with very little stakeholder and end user engagement and input. In general regulations are poorly enforced. Public transport in the form of ferries and speedboats in the region is sparse, with some areas on the lagoon being difficult to reach other than by personal transportation or taxi. The potential for sustainable tourism and eco-tourism across the whole lagoon area is high and the numbers of visitors overall has increased, but there is also low investment and planning in this sector. There has been an increase of 65% in total environmental protection expenditure since 2011.

### **Managed Horizons for Aveiro**

The resident population of Aveiro has increased by twelve percent. Employment has increased by 15% for 15-64 year olds and the number of under 25s in employment in the area has increased by twenty percent. Ria de Aveiro is both a thriving port and highly sustainable fishery and is the economic hub for a number of local and some national and international companies, employing a good proportion of residents full time. Stable economic success, through the promotion of the area's highly regarded fisheries and agriculture, including certified agricultural and traditional produce and crafts, is evident. The total available area for agriculture remains unchanged, but is better managed.

Traditional forms of employment and associated activities within the lagoon area as a whole are again a vital part of the economy and wellbeing of the lagoon, with certified high quality local produce and crafts from the region being promoted and sold in the domestic, tourist and international markets. The area is also widely respected and recognised as a desirable tourist destination having just been awarded the EU European Destination of Excellence (EDEN) award for sustainable ecotourism. This success is mainly due to the concerted and cumulative efforts of all the stakeholders of the local environmental strategy plan, which pays particular attention to good ecological and atmospheric quality to maintain:

- A balance between the natural, ecological and hydrological conditions of the whole lagoon area and regulation of associated economic and traditional activities.
- The navigability of the channels.
- Control of the waters by appropriate port infrastructures.
- Further improvements to WWTP and industrial infrastructures as required, retaining good water quality.
- Low levels of saltwater intrusion.
- Environmental management and/or Biodiversity adaptation able to cope with invasive species
- A diversity of both aquatic and land based plants and animals within the lagoon area.

Integrated sustainable management objectives shared between stakeholders, which include, amongst others, the local fishermen (both professional and recreational) the port authorities, business sector, residents, agriculturalists, artisans, tourist board, hunters, ecologists and the university, are based on ecological sustainability (as it is recognised and respected as a prerequisite for social and economic sustainability) and reviewed and revised regularly, depending on the feedback from the scheduled monitoring and localised spot checks of the

---

lagoon. The underlying 'living document' management plan is reviewed, updated and acted upon by a single autonomous entity – a committee of stakeholders, with representatives from all the municipalities of Aveiro included, alongside the local/regional decision makers - to take into account the multifaceted nature of the lagoon and any adaptive requirements. The committee also support local environmental or traditional activities educational programmes, often in association with the tourist board.

There are a number of low impact ways to get around the lagoon, including frequent scheduled boat ferries that move around the entire lagoon throughout the year, cycle routes and walking paths, multiple occupancy low cost taxis etc. The use of fishing gears and fishing practices are well regulated, licensed and monitored. Specific supervised areas are designated for the fishing and harvesting of clams. A number of sea and land areas have designated closed seasons. There has been an increase of 200% in total environmental protection expenditure since 2011.

### **Set Aside for Aveiro**

The resident population of the area has decreased by fifteen percent. Overall employment in the region has decreased by twenty percent. Ria de Aveiro is however a well supervised port and sustainable fishery (fishing numbers), providing stable employment for a number of local residents. The economic stability of the marine area is due to specific supervised areas which are designated for the fishing and harvesting of clams. A number of both sea and land areas have also designated closed seasons and additional closures in secondary areas added if monitoring of the primary designated areas shows a need. The total amount of land designated for agriculture has dropped by 50%, but is better managed. In addition there are a number of conservation areas that have permanently restricted access which provide ecosystem services and an indirect income as set aside for the lagoon (including more species for hunting and fishing etc.) and the surrounding areas.

While the number of visitors to the region has only increased by 9% since 2011 and the number of tourist beds available has remained the same the economic gain from tourism is much higher and more evenly spread throughout the year due to its reputation as a desirable, sustainable ecotourism destination. This is mainly due to the concerted and cumulative efforts of the stakeholders of the region's midterm environmental strategy and the underlying 'living document' management plan. The highly inclusive management plan and monitoring schedule is regularly reviewed and adapted by the stakeholders based on local knowledge updates and scientific evidence, as required, to retain the lagoon's ecological and environmental sustainability, which is fully recognised as fundamental to both aspects of the local economy and associated social activities.

Environmental management and/or Biodiversity adaptation able to cope with invasive species

Efficient and effective low carbon ways to move around the lagoon by boat, car and bike etc. are monitored and encouraged to make sure the best solutions are retained. Levels of employment and recreational endeavours in a diverse set of traditional activities remain stable due to the targeted recovery and conservation of the lagoon's ecological and environmental systems, retention of the Baixo Vouga dike and overall efforts made regarding its hydrologic dynamics. There has been a 400% increase in environmental protection expenditure since 2011.

### **Crisis for Aveiro**

---

The resident population of Aveiro has declined by thirty percent. Employment in the area has also declined further, with 50% of 15-64 year olds out of work and with 70% of unemployed being less than 25 years of age, who are leaving the area to find employment. Concentrated and ever increasing competition between harbour interests and fishermen, further aggravated by critically low levels of investment and management has dissolved any form of cooperation between the organisations affected. The presence of pollutants in the lagoon, due to badly managed and regulated economic and recreational activity, is at its highest recorded level and the overall condition of the lagoon is ecologically and environmentally unsound.

Local infrastructure and the transportation network is very rundown and local residents feel completely isolated and abandoned. Fisheries in the region have declined dramatically to unsustainable levels (fishing effort/stock numbers) and are on the verge of collapse, further worsened by fierce competition for the remaining fish stock not only between the professional fishermen but also due to the actions of recreational fishermen, neither of which are actively monitored or policed. Illegal trawling and bait digging is rife and unmonitored shellfish stocks have near enough disappeared, despite a long term ban on their harvesting due to prolonged levels of biotoxins in the area. A high number of indigenous flora and fauna, which used to be an integral and important part of the local environment and its economy, have been lost and in a number of instances replaced by highly invasive alien species, which do not help the local environment and have little commercial value.

The high level of salinization of the surrounding land due to salt water intrusion and the erosion of the lagoon's margins has severely affected the productivity of the land and the land area available for agriculture has diminished. Commercial farms have either been abandoned or are struggling to maintain their upkeep and the total area of land available for agriculture has dropped by fifteen percent. Agricultural productivity has to rely more and more on expensive feeds or additional fertilizers, with the agricultural runoff further affecting the already diminished quality of the water in the lagoon. A high number of families in the area are without a primary source of income and are now struggling to make ends meet as their secondary income source, or means of subsistence, from the land surrounding the lagoon or directly from the lagoon are so diminished.

There is a 40% decrease in the number of nights spent by tourists in the region. Employment centred on traditional activities has been completely abandoned, with only some associated relics on display in a small unmanned museum on the history of local life for the infrequent tourists passing through to view. There has been a decrease of 40% in total environmental protection expenditure since 2011.

### ***5.1.3 Tyligulskyi***

#### **BaU for Tyligulskyi**

Ukraine recently joined the EU. There has been an overall population decrease in the region with a 4% decrease in Odessa oblast and 12% within Mykolaivska oblast along with a slight decrease in employment in the region as a whole. The intensification of agriculture through the use of more industrial farming methods, including the quantity of chemical fertilizers used, intensive livestock management and the upsurge in deforestation has led to an increase in rural runoff. These agricultural changes coupled with unregulated development with no new household waste or wastewater treatment facilities, unlawful and damaging use of the landscape park and some industrial pollution have significantly contributed to the

---

deterioration and decline of both water quality and ecological conditions, leading to eutrophication. Recent weather changes have also been observed.

Ecosystem services are declining, which is also influenced by poaching. For example, the quantity and number of species for hunting and fishing are decreasing, with periodic fish kills not unknown as well as changes in the type of fish species seen. It is evident that natural resources are declining however there is very little activity in estimating and providing an inventory of species to estimate the rate of decline. Despite the increasing need for more environmental protection the number of staff employed by the environmental authorities has not changed since 2010 and they are overstretched. The number of tourists to the area keeps increasing. In the lower part of the lagoon which is close to the Black Sea, there is significant recreation (attracting around 300,000 people annually) but it is mainly concentrated during the summer months.

There is a lack of policy, planning and environmental management and enforcement levels mainly due to low investment and insufficient legislation for implementing the management of the region as a whole. There are also competing views on uses of the landscape park and the configuration of the channel. Coastal erosion and lack of control of illegal sand mining further contribute to the area's ecological and environmental decline and there are still a number of competing views regarding the use and zoning of the landscape park and the channel. A single control unit – in the form of a National Natural Park which joins the Odessa and Mykolaiv regions - with clearly demarcated areas for different uses, including recreation and tourism is still viewed as desirable. The management and physical infrastructure required to achieve that however is still not in place. Alternative forms of energy production are also not very evident. Expenditure on the protection of the environment is low.

### **Set Aside for Tyligulskyi**

There has been an overall population decrease of 10% in the whole region, with a 15-20% decrease in employment in the region. The uptake of sustainable agricultural and livestock management is prominent although the total area available for agriculture has decreased. A number of land and water based designated protected areas have either restricted or no access which benefits the area by providing essential recuperation of natural resources that in turn generate indirect income through the ecosystem services provided to the region. Zoned hunting and fishing areas in the lagoon are also well managed, monitored and controlled, with designated no access areas retained for conservation purposes.

All building and development works within the area are well regulated under an agreed sustainability code for the area along with provision of household waste/recycling and wastewater treatment facilities for all households and businesses. High end recreational and ecotourism activities are prominent although overall tourist numbers have not increased significantly and have been developed following strict planning and control procedures which are sustainable and provide a sound economy and stable employment in a number of sectors for the area, which is becoming well established and gaining a good all round reputation. Environmental management and enforcement throughout the area is backed up by clear and transparent policies, which also contributes to the maintenance of the areas as a coastal ecological corridor. Regular meetings are held for stakeholders to meet, discuss and resolve any issues regarding, for example, the landscape park or channel/water exchange. Total expenditure on the protection of the environment has increased.

### **Managed Horizons for Tyligulskyi**

---

There has been an overall population and employment levels remain unchanged in the whole region. While the area of land for agriculture also remains unchanged there are positive changes seen in the landscape and environmental status of the area due to revised practices in relation to agriculture, livestock management and levels of forestation which are reviewed and appropriate recommendations and actions taken. These agricultural changes coupled with a well regulated and updated sustainability code ensures that: buildings and any form of development adhere to the code; household waste or wastewater treatment facilities are always adequate; ecologically sound use and status of the landscape park is retained; the likelihood of pollution events due to industry in the area is low. These actions contribute to the continued safeguarding of both water quality and ecological conditions, minimising the chances of eutrophication.

Ecosystem services are steadily improving enhanced by regular monitoring and reporting of any changes or possible impacts. For example, the quantity and number of species for hunting and fishing are increasing and there is a full examination of the causes when periodic fish kills or any other unusual event occurs to establish a cause. The recent weather changes which have been observed are closely monitored in case action is required.

Policy, planning and environmental management and enforcement levels are improving due to higher investment levels. Competing views on uses of the landscape park and the configuration of the channel exist, however current action plans are regularly reviewed jointly by stakeholders and authorities. Coastal erosion due to weather events or climatic changes is closely monitored and remedial action taken as required while illegal sand mining is strictly prohibited. The expenditure on protecting the environment has increased.

### **Crisis for Tyligulskiy**

There has been an overall population decrease of 30-40% and employment levels have dropped by nearly 20% in the whole region. Intensification of agriculture and livestock management has rapidly increased along with severe and continuous deforestation which has led to very high levels of rural runoff. High levels of unregulated development with no household waste or wastewater treatment facilities, unmonitored, uncontrolled and unlawful use of the landscape park and high levels of industrial pollution also contribute significantly to the severe decline and worsening of both water quality and ecological conditions, leading to eutrophication.

Ecosystem services have declined rapidly due to ecological and environmental deterioration, which are further impacted by heavy poaching of fish and game animals. For example, the quantity and number of species for hunting and fishing are very low, with frequent fish kills as well as changes in the type of fish species seen. Recent weather changes have also been observed. A complete lack of policy, planning and environmental management and enforcement levels is predominantly due to low investment. There are also competing and intractable views on uses of the landscape park and the configuration of the channel with no management of the situation to try and resolve them. Coastal erosion and illegal sand mining has also significantly contributed to the area's ecological and environmental decline. The expenditure on environmental protection has declined.

### **5.1.4 Vistula (PL side only)**

---

### **BaU for Vistula**

The overall population in the region remains unchanged but overall employment levels have increased by 22% from 2010 levels. However, diversification of the job sector – particularly in Warmińsko-Mazurskie is slow. Job opportunities directly around the lagoon are lacking and there is an outflow of people – particularly the younger skilled generation. Local transportation links are slightly improved but still inadequate with few ferry and road linkages to major routes. Infrastructure for and management of transport, fishing, industry, flooding/drainage and sustainable tourism is still inadequate, further compounded by poor levels of initiatives, investment and promotion of the area. There is a lack of, or inappropriate levels of, maintenance or conservation of the lagoon (which is also designated as a Natura 2000 site) and the surrounding area which also suffers from illegal dumping.

Poor and irregular local administration which does not include local stakeholder involvement is coupled with either inter-municipality competitiveness or failure to act by the local authorities regarding any potential funding or investment bids. There are also regulatory imbalances and poor communication channels between PL/RU regarding a number of issues as with, for example, fisheries. EU regulatory limits are in place for the Polish side whilst facing competition from the Russian side for the lagoon's resources. Traditional fish stocks are declining (e.g. eel, pike-perch, salmon) which are also affected by lack of funding for stocking the lagoon with juvenile fish, poaching and the high number of cormorants (8000 bp in KR 2010) living and nesting in the lagoon. However, a few individuals are trying to do something, e.g. redevelopment of cathedral hill at Frombork; there are some attempts at resuming the practice of restocking the lagoon with juvenile eel.

There has been a 5% increase of the total available area for agricultural use. While there has been local interest in developing agro-tourism and ecotourism these sectors are in decline and while visitor numbers have increased the visitors that do come to the area tend to be mainly only day tourists or for short trips. As the demand for tourist bed places has dropped then the available bed spaces have also declined. Despite the use of fertilizer on the fields being less intensive and an increase in the number of wastewater treatment plants water quality is decreasing along with the increasing occurrence of algal blooms, particularly during the peak holiday months in summer. The Polish side of the lagoon is also severely impacted by the S22 road leading up to the Russian border, with many towns and localities having restricted or no access to their properties due to reduced number of junctions. There are varying opinions, in favour and against, the plans for a cross-cut across the Spit to gain access directly to/from the sea from the Polish side. However, it looks unlikely as the funds required are lacking and there is insufficient need for it.

### **Managed Horizons for Vistula**

The resident population has increased by 3-6% and employment in the region has increased by 35% percent. Job opportunities are available across a number of sectors and there is a low outflow of people – particularly the younger skilled generation. The required infrastructure for transport, fishing, industry and sustainable tourism is in place and helps to further and encourage initiatives, investment and promotion of the area. Flood management and drainage issues are jointly supervised by all the local authorities. Conservation of the lagoon as a Natura 2000 site is well monitored and maintained and the illegal dumping that used to be widespread is virtually non-existent with any sightings reported to authorities and acted upon immediately. The local administration actively includes local stakeholder involvement which is coupled with inter-municipality cooperation between the local authorities regarding some larger or more widespread issues that could affect the lagoon including potential funding or investment bids. Regulatory imbalances and poor communication channels between PL/RU regarding a number of issues as with, for example,

---

fisheries are resolved and on-going, helping to maintain the social, environmental and economic health of the lagoon. The number of visitors to the region has increased but the number of beds available remains the same as in 2011 as they are more fully occupied. Agro-tourism and eco/sustainable tourism are the dominant form of tourism and a high number of visitors that do visit stay for a week or more. While the total area available for agriculture has not changed the utilised area has increased by 25-30 percent.

The number of wastewater treatment plants and sustainable farming practices has increased and water quality is very good with algal blooms now a rare event. Traditional fish stocks are much improved (e.g. eel, pike-perch, and salmon) and poaching is kept in check by heavy fines and increased local awareness. Attempts at resuming the practice of restocking e.g. with juvenile eel are successful and a number of schemes are in place in direct cooperation with the Russians. The number of cormorants living and nesting in the vicinity of the lagoon are monitored and checked. A number of small local and nationally funded schemes to improve and restore local artefacts are also in place. Local access to the S22 road leading up to the Russian border is greatly improved. There are varying opinions, in favour and against, the plans for a cross-cut across the Spit to gain access directly to/from the sea from the Polish side.

### **Set Aside for Vistula**

The resident population has decreased by 20% and employment in the region has increased by 5% percent. Job opportunities are stable across a number of sectors and the outflow of people – particularly the younger skilled generation has slowed down. The required infrastructure for the area has improved and any further improvements which may be required are closely monitored and assessed helping to further initiatives, investment and promotion while maintaining overall sustainability and conservation of the area. Flood management and drainage issues are on-going through supervision and monitoring, carried out jointly by all the local authorities.

Conservation of the lagoon as a Natura 2000 site is well monitored and maintained for any changes. The total agricultural area has decreased by 50% due to set aside, providing essential recuperation of natural resources that in turn generate indirect income through the ecosystem services provided to the region. Due vigilance and required action and prevention is apparent regarding illegal dumping. The local administration actively includes local stakeholder involvement when policies and planning for the lagoon possibly need to be revised. This is coupled with improved inter-municipality cooperation between the local authorities and communities regarding some larger or more widespread issues that could affect the lagoon including potential funding or investment bids. The need to resolve the regulatory imbalances and lack of communication channels between PL/RU regarding a number of issues as with, for example, fisheries, are underway and some benefits due to this are already evident. Agro-tourism and eco/sustainable tourism is a growing form of tourism attracting a number of longer term visitors. The number of wastewater treatment plants and sustainable farming practices has steadily increase addressing demand and water quality is very good with algal blooms now becoming a rare event.

Traditional fish stocks are improving (e.g. eel, pike-perch, and salmon) and poaching is kept to a minimum due to heavy fines, increased local awareness of its impact and the introduction of designated no access areas retained for conservation and replenishment of stocks. The number of cormorants living and nesting in the lagoon are regularly monitored and checked. A number of schemes are in place for restocking e.g. with juvenile eel and so far are successful with some schemes being run in direct cooperation with the Russians. Local access to the S22 road leading up to the Russian border is improving. There are

---



varying opinions, in favour and against, the plans for a cross-cut across the Spit to gain access directly to/from the sea from the Polish side.

### **Crisis for Vistula**

The overall population in the region has fallen by 30-35% and overall employment levels have decreased by twenty percent. Job opportunities are at an all-time low across all sectors and there is a continuous high outflow of skilled and tertiary level educated local people, particularly the under 25s. The required infrastructure for transport, fishing, industry and sustainable tourism is either in complete disrepair or non-existent with no initiatives, investment and promotion of the area.

Flood management and drainage issues are chaotic, unsupervised and uncontrolled. Conservation of the lagoon as a Natura 2000 site is neglected and illegal dumping is unmonitored, unregulated and widespread. Local administrations continue to neglect and exclude local stakeholder involvement and while inter-municipality competition between the local authorities is high, cooperation regarding some larger or more widespread issues that could affect the lagoon including potential funding or investment bids is severely lacking. Regulatory imbalances and poor communication channels between PL/RU regarding a number of issues as with, for example, fisheries, are not resolved and affect the whole social, environmental and economic health of the lagoon.

There has been a 10% decrease in the total area for agricultural use and a decrease of 25% in the utilised area of agriculture. Agro-tourism and eco/sustainable tourism have declined dramatically and the few visitors that do visit very rarely stay for more than a 1-2 days. Total nights spent by visitors has declined by 30% and there is a 60% drop in the number of bed spaces available. Water quality is very poor with frequent algal blooms. Traditional fish stocks are completely depleted (e.g. eel, pike-perch, and salmon) and poaching is widespread and not acted upon. The number of cormorants living and nesting in the lagoon is extremely high and out of control. Attempts at resuming the practice of restocking e.g. with juvenile eel are abandoned and there are no schemes or agreements in place with the Russian side of the lagoon. Local access to the S22 road leading up to the Russian border is worsening due to lack of local access and lack of maintenance. The varying opinions, in favour and against, the proposed plans for a cross-cut across the Spit to gain access directly to/from the sea from the Polish side is causing a high number of rifts and arguments between communities within the area.

## **5.2 Translating storylines into data**

The drivers identified in the qualitative storylines were sub-divided into constituents that could be quantified through the use of Eurostats and other compilations of statistics. The first task for WP4 was to identify the base-line figures and to extrapolate future trends for the 'business as usual' scenarios. These were calculated on the basis of developments during the last 10 to 11 years, depending on the time series for the data. Where possible NUTS3 data was used, otherwise NUTS2 data was used. In some cases, for example expenditure on environmental protection, country level data was used as data was only available at that level.

BAU scenarios for the year 2030 were then calculated using a continuation of these trends during the coming 17 years. Quantification of the other three policy scenarios were

---

calculated using analyses of conditions in the case areas and the depiction of the future provided in the corresponding qualitative storylines. The variables used and calculated can be seen in the Excel tables in Appendix IV. Some of this information was used in the modelling, some in the final refinement of the scenarios before presentation to the stakeholders and policy makers at the final workshops. Details of how the qualitative scenario storylines were used for the final scenarios; the accompanying complimentary numerical data provided by WP4; the Bioforsk, the UAVR, WP5 and WP6 modelling used for the final stakeholder workshops; and the outputs of the final workshops are available within the associated WP4 report “LAGOONS 2014 Report D4.2 Final Scenarios”.

## 6. Final workshop

### 6.1 Preparation work by University of Dundee for workshop training day and input into final stakeholder workshops

Prior to the workshop training day (details provided in the next section) a generic template of the possible layout and content of the scenario posters, to be used at the final workshops, was devised and circulated by WP4 to CSA project members and project modellers (see Figure 1 below). This suggested layout of the scenario posters was then used by the CSA members as a basis for their own production of the posters presented at the training day and eventually used for the final workshops in their CSAs.

**General scenario posters layout and content created and suggested by WP4 for final workshop:**

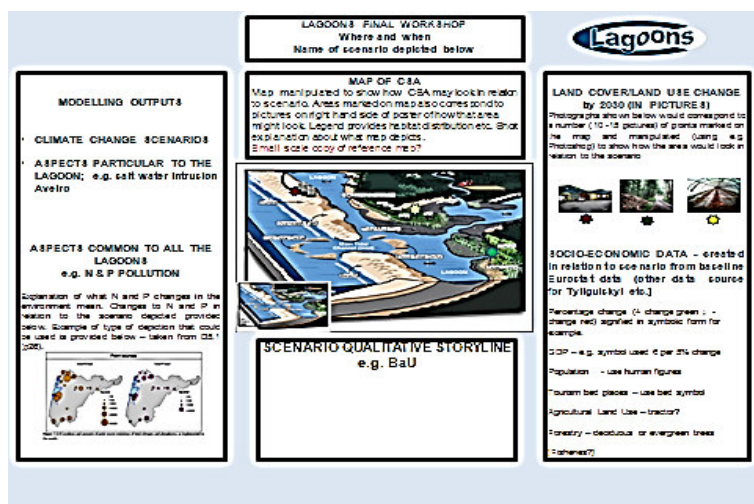


Figure 1 WP4 Suggested layout and content of scenario posters

### 6.2 Final workshop training day for project members

In preparation for the final stakeholder workshops a training day devised and conducted by University of Dundee was held on the 24<sup>th</sup> of April 2014, during the consortium meeting (22<sup>nd</sup> -25<sup>th</sup> April) at Hotel Sylter Hof, Berlin, Germany. The training day (see Appendix III) consisted of:

- Presentation on stakeholder input into policy recommendations.
- Presentation on understanding the management of ecosystems for the delivery of multiple benefits.
- Presentation and discussion on preparing material for the final workshops; what the poster presentations should contain; how the modelling results should be presented.
- Time for each case study partner to present their proposed preliminary presentation for their CSA's workshop and for all project members to view, circulate and discuss printed versions of CSA scenario posters on display.
- Time for content and planning of workshops including: general schedule for preparation for and content of actual workshop day; planning of final layout of scenario posters and presentations needed; background material or handouts required for participants.

### **6.3 Outputs of final workshop**

Final stakeholder workshops were held in:

- Mar Menor on the 24<sup>th</sup> of May with 17 participants.
- Ria de Aveiro on the 22<sup>nd</sup> of May with 32 participants.
- Tyligulskyi on the 29<sup>th</sup> of May with 24 participants.

Due to the postponement of the final stakeholder workshop for the Vistula lagoon to July 2014 then details of that workshop are not included in this report, as this would have further delayed the issueing of this report (and report D4.2) to the European Commission. Only the activities before and during the FGs and CJs and in preparation for the final workshop are therefore included here for the Vistula.

The final scenarios presented at and outputs of the final stakeholder workshops are detailed in the associated WP4 report “LAGOONS 2014, D4.2 Final Scenarios”.

## **7. Summary**

This report provides details of the main activities carried out by WP4 for the duration of the LAGOONS project, up to the final stakeholder workshops. The main activities of WP4 included:

- Capacity building through the use of activities which included: (i) training of CSA project members in the participatory processes used during the project (including content and running of final workshop); (ii) active engagement of stakeholders through the sequential forms of participation used which provided the participants with a platform for knowledge sharing, knowledge transfer, open deliberations and ultimately provision of recommendations on planning for the future of the CSAs.
-

- Study and analysis of the outputs of the focus groups and citizens' juries and formation of loosely aggregated DPSIR tables per CSA to help create and develop the qualitative scenario storylines.
- Creation and development of the qualitative scenario storylines.
- Production of complimentary numerical data to accompany and reflect the content of all 16 qualitative scenario storylines, based on actual quantitative socioeconomic, demographic, land use and other data (e.g. Eurostat).

## References

Baggett, S. Gooch, G. D. Hendry, S. Bielecka, M. Katerusha, O. Bello Marin, C. Sousa, L. P. (2013). Using participatory methods for coastal lagoon management and climate change. In: Roebeling, P.C. & Rocha, J. (Eds), 2013. Proceedings of the TWAM2013 International Conference & Workshops (CD-ROM). CESAM – Department of Environment & Planning, University of Aveiro, Portugal. 93pp.

Gooch, G. D. & Stålnacke, P. (eds) (2006). Integrated transboundary water management in theory and practice: experiences from the new EU eastern borders. International Water Association Publishing.

LAGOONS (2014). Report D4.2 Final Scenarios, LAGOONS.

## Appendix I Focus group meetings

Resources used for focus group meetings (*following text verbatim as provided by CSA members*):

### Aveiro

#### **- Type of focus group purpose statement/guide/flyer used**

UAVR team contacted directly the respective parish president who helped to gather the parish inhabitants to participate in the FG's. The respective parish president's were informed about the project objectives and the operation of the FG's. They were also left with LAGOONS project flyers, written in Portuguese, in order to inform the potential participants.

#### **- Set of warm up/open questions used –**

The participants were welcomed by the UAVR facilitator and note keeper and were explained about the objectives of the project and the meaning of their participation.

The set of warm up/open questions used was *'what are the uses that you make of the lagoon?'*

The discussion by the focus group's focused on the lagoon, and the facilitators ensured that all the previously agreed questions were covered (even if the order was not followed).

In the end all participants socialized drinking coffee and cakes.

The focus groups were conducted within the participants' locality, mostly at the respective parish reunion's room, and took place at a convenient hour for the participants, i.e., starting the earliest at 10:00 am and the latest at 9:00 pm. The UAVR facilitators were Ana Lillebø, Lisa Sousa and Fátima Alves, whilst the note keepers were Lisa Sousa, Eduardo Oliveira and João Soares.

#### **- Use of CSA maps, green/red stickers etc –**

After the participative discussion the participants were invited to identify green areas in the Ria map, related to positive characteristics, and the red areas, related to issues of concern.

#### **- Ways in which focus group data were collected/recorded**

Sessions were audio recorder – Participants were informed that the session would be audio recorded to facilitate the following transcription and reporting (all participants signed the informed consent form).

### Mar Menor

#### **- Type of focus group purpose statement/guide/flyer used**

Mar Menor Lagoon flyer included information on the project goal, Lagoon's web site and university partners logo.

#### **- Set of warm up/open questions used –** there was no specific set of warm up/open questions;

We take few minutes before start the focus group asking the participant's questions and sometimes doubts. We also explain them more about the Focus Group objective and the Lagoon project. Once everything was clear, we ask for permission to record their conversation.

---

**- Use of CSA maps, green/red stickers etc** – Mar Menor Lagoon map was used with red and green stickers; then photo of the map with stickers was made.

**- Ways in which focus group data were collected/recorded** – we recorded with a professional recorder buy for this porpoise. We stand the recorder on the table. We just used ones a camera, in the first focus group, but we realize the participants didn't feel relax because the camera.

### **Tyligulskyi Lagoon**

**- Type of focus group purpose statement/guide/flyer used**

Ukrainian flyer on the Tyligulskyi Lagoon as well as the flyer on the LAGOONS project, Focus Group Questionary.

**- Set of warm up/open questions used – there was no specific set of warm up/open questions;**

What is the Focus group approach? Why it is applied for the LAGOON project?

**- Use of CSA maps, green/red stickers etc –**

The map of the Tyligulskyi Lagoon catchment with some “hotpoints” – sand mining, garbage etc. Red, green and yellow stickers are used for the discussion.

**- Ways in which focus group data were collected/recorded**

only audio recorder – the participants felt shy with the video recorder and were silent.

### **Vistula Lagoon**

**Type of focus group purpose statement/guide/flyer used**

Polish Flyer on Vistula Lagoon including information on the project goals, activities and analysed problems + Participant information sheet, informed consent, Focus Groups Questions – all in Polish + Power Point presentation of the Project with the focus on Vistula Lagoon (in Polish); all materials were distributed to the participants, however nobody felt obliged to sign informed consent – they just accepted this.

**Set of warm up/open questions used – there was no specific set of warm up/open questions;** depending on group and situation we tried establish first contact commenting what we are doing (setting the recording equipment), or talking about weather, or some present situation, or just presenting the handouts we had, joking, etc. – just following the situation; people normally were so interested to present their problems that they started to talk without any invitation (very good example from Piaski, where already at the pier fishermen started to talk and it was difficult to move to some place where we could set out our recording equipment); we had flexible attitude;

**Use of CSA maps, green/red stickers etc** – Vistula Lagoon map was used with red, green and yellow (yellow was for “not sure if red or green”) stickers; then photo of the map with stickers was made;

**Ways in which focus group data were collected/recorded** – we recorded both audio (recorder with mic standing on a table) and video (stationary camera, usually in a corner of a room); simultaneously notes were taken.

---

# **Appendix II Citizens' Jury training days**

## **LAGOONS Citizens' Jury training workshop**

**Potsdam 29-30 January 2013**

### **Agenda Day 1**

#### **Morning session 09.00-12.00**

- 09.00 Welcome and briefing on content of the next two days – Geoff
- 09.30 What is a citizens' jury- in a nutshell? - Geoff
- 10.00 Show film on DIY CJs (22mins long) – Sue Baggett
- 10.30 Coffee
- 10.45 What the participants are expected to do including: their role playing parts as expert witnesses for the fictitious lagoon 'Lagoonio'; acting as the jurors; moderating; rapporteurs - provide everyone with briefs on who will be doing what at this point – Geoff, Sue and Sarah Hendry
- 11.15 Discussion and questions
- 11.45 Issuing of written material, guides etc. (we will include everything on memory sticks to be issued to each participant).

#### **Lunch 12.00-13.00**

#### **Afternoon session 13.00-18.00**

CJ role playing the process, with expert witnesses for the following:

- 13.00 Agriculture – Per
- 13.45 Commercial fishing and shellfish – Ana
- 14.30 Coffee
- 14.45 Water quality and nutrients – Gosia
- 15.30 Transport and infrastructure – Joanna
- 16.45 Tourist industry - Carol
- 17.30 Discussion and reflections of Day 1 - Geoff
- 18.00 End of Day 1

The expert witnesses should act the part of either objective experts (climate change and water quality) or representatives of special interests (agriculture, commercial fishing and transport). Each expert witness session will be for 45 minutes in total and consist of the following (including time to change rooms):

- 15 minutes presentation (including slides).
  - 15 minutes discussion (where the jurors go out and discuss the content of the expert witness session and questions they would like to ask them). There will be two
-

separate groups with one person acting as moderator and one as the rapporteur per group, after which they will reconvene in the meeting room.

- 15 minutes questions. The designated rapporteur of each group will raise the questions they want answered based on their group discussion back to the expert witness.

## **Day 2**

### **Morning session 09.00-12.00**

- 09.00 Brief recap on the previous day and today's agenda - Geoff
- 09.30 Recreational hunting and fishing – Valeriy
- 10.15 Coffee
- 10.30 Nature protection and conservation - Grzegorz
- 11.15 Law regulation and management – Sarah

### **Lunch 12.00-13.00**

### **Afternoon session 13.00-18.00**

- 13.00 The Jury debates and discusses, and formulates scenarios and recommendations
  - 14.30 Rapporteurs present their verdict and recommendations back to the whole jury and expert witnesses
  - 15.00 Coffee
  - 15.30 General discussion on the process
  - 16.30 The four CSAs – what next?
  - 17.00 Planning for each CSA – experts needed; dates; resources and planning required.
  - 18.00 End of Day 2
-



## Appendix III Schedule for final stakeholders' workshops

### Common schedule used for LAGOONS final stakeholder workshop

- Welcome and introduction; provide a brief overview of the project and what has been achieved so far. Present and provide copy of workshop agenda and explain workshop's aim; what they should expect from the day and how vital their active participation in it is. It should be a fun day! (15 - 20 minutes).
- Warm-up activity (optional). Creative warm-up/icebreaker of your choosing. Or everyone could briefly introduce themselves; or ask participants to introduce themselves to their nearest neighbours. (15 - 20 minutes).
- Slide presentation describing current situation regarding the: catchment; lagoon; climate. Also briefly include in this presentation how: qualitative scenarios were formed based on issues and concerns raised and discussed during the focus groups and citizens' juries previously conducted in the CSA. Brief explanation of how some of the socio-economic data has been used for modelling the scenarios. Modelling of data by WP5 and WP6. (20 minutes).
- Slide presentation of the scenarios – presenting each individual section of the poster for each of the scenarios. (20 - 30 minutes).

#### Break

- Stakeholders formed into mixed groups; allocation of moderator/rapporteur per group. Try to ensure that groups are as diverse as possible to allow for different perspectives on the same issue. Ideally groups should consist of 6-8 persons, but is obviously reliant on:
  - (i) Number of participants;
  - (ii) Whether there will be a poster on climate change alone (10mins).
- Allocate time for each group at each poster to avoid overcrowding. Groups then:
  - (i) View each of the scenario poster presentations in turn;
  - (ii) Discuss the viewed scenarios in their groups (including blank 'scenario' for them to use/fill out) with a moderator/rapporteur per group to manage/take notes.

Time you allocate for this section of the workshop is dependent on the number of posters presented and also the blank scenario/map, plus discussion time – suggest approx. 90mins.

Suggestion: Posters could also be available to be freely viewed by individuals during the previous break.

#### Break

- Final discussion of the workshop (all groups together). The designated rapporteur from each group present their responses (including an alternative scenario if generated) in turn to all the workshop participants, with facilitator directing/managing
-

the resulting discussion along with a moderator and/or rapporteur to jot down on board main points of discussion, compile discussion and take notes. (1 hour).

#### Break

- Summarise and evaluate the day. Tell participants what next regarding use of their input during the workshop and what feedback will be provided to them by the project. (15mins).

- Give out short feedback form/questionnaire and ask each participant to fill out and return form before they depart. Close of day - and a big thanks to everyone! (15mins).

#### Notes:

- Background information and summary of workshop content provided to participants prior to workshop.

- Hand outs on the day to include: workshop agenda; include background information; summary of workshop presentations and posters; text of scenario storylines. Provide participants with pens, notepads, sticky notes etc.

- Translated transcripts of the workshop outputs need to be provided to WP4 one week after the workshops.

---

## Appendix IV Supplementary quantitative data sets for qualitative storylines

Quantitative Data compiled and manipulated by WP4 and used:

- (i) To complement and quantify the qualitative storylines per scenario;
- (ii) as basis for modelling scenarios by Bioforsk, WP5 and WP6.

MAR MENOR									
Main Drivers	2 <sup>nd</sup> level drivers	Indicators	Data Source	Code	Baseline	BAU (2030)	Crisis	Managed Horizons	Set Aside
Economy	Fishing/ shellfish						-50%	20%	40%
	Aqua culture						-50%	20%	0%
	GDP (PPS index )		Eurostat 2011	NUTS 1	98% of EU avg	-3%	-30%	10%	5%
	Tourism	Total nights spent	Eurostat 2011	NUTS 2 ES62	4573452	2%	-10%	4%	-5%
		No of bed places	Eurostat 2011	NUTS 2 ES62	49704	50%	10%	0%	-10%
Population	Numbers	Mar Menor basin inhabitants	Census 2011		355510	28%	-20%	10%	-10%
	Numbers	Total resident ppn	Eurostat 2011	NUTS 2 ES62	1472200	28%	-20%	10%	-10%
		Total ppn	Europop 2008	NUTS 2 ES62	1485000	28%	-20%	10%	-10%
	Demo graphy	Crude popn growth rate - %	EuroPop 2008	NUTS 2 ES62		13.20%	-5%	15%	-15%
		% total ppn 65 or over	EuroPop 2008	NUTS 2 ES62	13.4	30.00%	50%	20%	35%
		Employment rate 15-64 - %	Eurostat 2011	NUTS 2 ES62	54.5	-8%	-40%	20%	-15%
		Unemployment rate total yo %	Eurostat 2013	NUTS 1	26.9	8%	40%	-30%	15%
		Unemployment rate <25 yo %	Eurostat 2013	NUTS 1	56.5	40%	60%	-30%	40%

	WWTPs								
<b>Land Use</b>		Area total use sq km	Eurostat 2009	NUTS 2 ES62	11310	-5%	-5%	-5%	-5%
	Agriculture	Area agriculture total sq. km	Eurostat 2009	NUTS 2 ES62	5232	0%	-10%	0%	-15%
	Agriculture	Area agriculture excl fallow, kitchen sq. km	Eurostat 2009	NUTS 2 ES62	3906	-14%	-30%	5%	-15%
	Agriculture	Utilized agriculture area ha	Eurostat 2005	NUTS 2/3 ES62/0	397150	-14%	-30%	5%	-15%
	Agriculture	Fallow & abandoned land sq. km	Eurostat 2009	NUTS 2/3 ES62/0	1288	14%	30%	-5%	15%
		Crops (cereal and rice) yield 100kg per ha	Eurostat 2006	NUTS 2 ES62	12.9	40%	-15%	50%	40%
	Agriculture	Irrigation - ha total irrigable & irrigated	Eurostat 2007	NUTS 2/3 ES62/0	157120	-22%	-45%	5%	-25%
		Utilised agricultural area organic in ha	Eurostat 2007	NUTS 2/3 ES62/0	26360	120%	-20%	150%	90%
	Agriculture - livestock	Live bovine animals – numbers	Eurostat 2011	NUTS 2 ES62	573000	19%	-5%	20%	-25%
	Forest	Forestry sq. km	Eurostat 2009	NUTS 2 ES62	553	0%	-20%	5%	10%
	Hunting & fishing	Hunting & fishing sq. km	Eurostat 2009	NUTS 2 ES62	876	-5%	0%	5%	-20%
	Settlements	Population density inhabs/km2	Eurostat 2011	NUTS 2 ES62	130.4	21%	-20%	0%	-20%
	Heavy environmental impact	Heavy env impact sq. km	Eurostat 2009	NUTS 2 ES62	319				
	Services & residential	Services & residential sq. km	Eurostat 2009	NUTS 2 ES62	1344	15%	5%	0%	-15%

		No visible use sq. km	Eurostat 2009	NUTS 2 ES62	2986	-5%	10%	-5%	20%
<b>Env protection expenditure</b>									
	Enviro protection expenditure - total	Euro per inhabitant	Eurostat 2010	NUTS 1 ES	422				
<b>Env protection expenditure</b>	Industry	Percentage of GDP	Eurostat 2010	NUTS 1 ES	0.23%	-23%	-50%	10%	20%
	General government	Percentage of GDP	Eurostat 2010	NUTS 1 ES	0.30%	40%	0%	75%	150%
	Private & public env service providers	Percentage of GDP	Eurostat 2010	NUTS 1 ES	1.09%	9.60%	-20%	20%	40%
	Enviro protection expenditure - total	Percentage of GDP	Eurostat 2010	NUTS 1 ES	1.62%	9%	-40%	30%	60%

RIA de AVEIRO									
Main Drivers	2 <sup>nd</sup> level drivers	Indicator	Data Source	Code	Baseline	BAU (2030)	Crisis	Managed Horizons	Set aside
<b>Economy</b>	Fishing/shellfish						-50%	20%	40%
	Aquaculture						-50%	20%	20%
	GDP	GDP (PPS index)	Eurostat 2011	NUTS 1	77% of EU avg	-10%	-50%	20%	10%
	Tourism	Total nights spent	Eurostat 2011	NUTS 2 PT16	5988216	9%	-40%	30%	9%
		No of bed places	Eurostat 2011	NUTS 2 PT16	107297	-5%	-25%	5%	-5%
<b>Population</b>	Numbers	Vouga river drainage basin ppn	Census 2011		961316	6%	-30%	12%	-15%
	Numbers	Ria inhabitants	Census 2011		353688	6%	-30%	12%	-15%
	Numbers	Total resident ppn	Eurostat 2011	NUTS 2 PT16	2325000	6%	-30%	12%	-15%
		Total ppn	Europop 2008	NUTS 2 PT16	2409000	6%	-30%	12%	-15%
	Demography	Crude popn growth rate %	EuroPop 2008	NUTS 2 PT16		3%	-15%	5%	-5%
		% total ppn 65 or over	Europop 2008	NUTS 2 PT16	20.50	10%	30%	0%	15%
		Employment rate 15-64 yo - %	Eurostat 2011	NUTS 2 PT16	66.10	-10%	-40%	15%	-20%
		Unemployment rate total yo %	Eurostat 2013	NUTS 1	17.60	10%	30%	-15%	20%
		Unemployment rate <25 yo %	Eurostat 2013	NUTS 1	42.10	50%	75%	-50%	50%
	Wastewater treatment					0%	-25%	10%	0%
<b>Land Use</b>		Area total land use sq. km	Eurostat 2009	NUTS 2 PT16	28188	-5%	-5%	-5%	-5%
	Agriculture	Area agriculture total sq. km	Eurostat 2009	NUTS 2 PT16	8416	-10%	-15%	0%	-50%
	Agriculture	Area agricultural excl fallow, kitchen sq. km	Eurostat 2009	NUTS 2 PT16	4619	-25%	-50%	0%	-50%

	Agriculture	Utilized area ha	Eurostat 2005	NUTS 3 PT161	26720	-25%	-50%	0%	-50%
		Fallow & abandoned land sq. km	Eurostat 2009	NUTS 2 PT16	3619	25%	50%	0%	50%
	Agriculture	Crops (cereal & rice) yield 100kg per ha	Eurostat 2009	NUTS 2 PT16	43	30%	-20%	50%	30%
	Agriculture	Irrigation - ha total irrigable & irrigated	Eurostat 2007	NUTS 3 PT161	21620	0%	-30%	15%	-15%
	Agriculture	Utilised agricultural area organic in ha	Eurostat 2007	NUTS 2 PT16	36680	100%	-25%	125%	75%
	Agriculture - livestock	Live bovine animals	Eurostat 2011	NUTS 2 PT16	195600	-15%	-30%	0%	-50%
	Forest	Forestry sq. km	Eurostat 2009	NUTS 2 PT16	12563	0%	-20%	0%	20%
	Hunting & fishing	Hunting & fishing sq. km	Eurostat 2009	NUTS 2 PT16	16	-5%	0%	5%	-20%
	Settlements	Popn density inhabs/km2	Eurostat 2011	NUTS 2 PT16	82.4	5%	-20%	10%	-10%
	Heavy environmental impact	Heavy env impact sq. km	Eurostat 2009	NUTS 2 PT16	1165	10%	40%	-20%	-50%
	Services & residential	Services & residential sq. km	Eurostat 2009	NUTS 2 PT16	2125	5%	0%	20%	-5%
		No visible use sq. km	Eurostat 2009	NUTS 2 PT16	3903	15%	30%	-5%	50%
<b>Enviro protection expenditure</b>									
	Industry	Euro per inhabitant	Eurostat 2011	NUTS 1	37.38	2%			
	General government	Euro per inhabitant	Eurostat 2011	NUTS 1	78.41	20%			
	Private & public env service providers	Euro per inhabitant	Eurostat 2011	NUTS 1	98	200%			
	Enviro protection expenditure - total	Euro per inhabitant	Eurostat 2011	NUTS 1	213.79	100%			
<b>Envirol protection expenditure</b>									
	Industry	Percentage of GDP	Eurostat 2011	NUTS 1	0.23%	-30%	-60%	10%	20%

	General government	Percentage of GDP	Eurostat 2011	NUTS 1	0.48%	-15%	-30%	5%	20%
	Private & public env service providers	Percentage of GDP	Eurostat 2011	NUTS 1	0.67%	200%	0%	400%	200%
	Enviro protection expenditure - total	Percentage of GDP	Eurostat 2011	NUTS 1	1.38%	65%	-40%	200%	400%

TYLIGULSKYI									
Main Drivers	2 <sup>nd</sup> level drivers		Data Source	Code	Baseline	BAU (2030)	Crisis	Managed Horizons	Set Aside
Economy	Fishing/shellfish						-50%	20%	40%
	Aquaculture						-50%	20%	0%
	GDP using PPP index in US\$		Indexmundi	Country level 2011	7300	150%	0%	250%	100%
	Tourism	Total nights spent							
		No of bed places in Koblevo in Mykolaiv district	Report D2.1d - Tyli mezoregion		17000				
Population	Numbers	Population total Odessa oblast	UKR Demographic passport 2013		2395160	-4%	-30%	0%	-15%
		Population total Mykolaivska oblast	UKR Demographic passport 2013		1173481	-12%	-40%	0%	-20%
	Numbers	Total ppn in Kominternovskyi district	D2.1d - Tyli mezoregion		65000	-4%	-30%	0%	-15%
		Total ppn in Berezivskyi district	D2.1d - Tyli mezoregion		34000	-4%	-30%	0%	-15%
		Total ppn in Berezanskyi district	D2.1d - Tyli mezoregion		24000	-12%	-40%	0%	-20%
	Demography	Natural ppn increase Odessa oblast per 1000 ppn	UKR Demographic passport 2013		-1.9	-4%	-15%	0%	-10%
		Natural ppn increase Mykolaivska oblast per 1000 ppn	UKR Demographic passport 2013		-3.8	-12%	-40%	0%	-20%
		Natural ppn increase per Kominternovskyi 1000 ppn	D2.1d - Tyli mezoregion		-1.3	-2.50%	-15%	0%	-20%
		Natural ppn increase per	D2.1d - Tyli		-5	-10%	-30%	0%	-20%



		Berezivskiy 1000 ppn	mezoregion						
		Natural ppn increase per Berezanskyi 1000 ppn	D2.1d - Tyli mezoregion		-2.8	-5%	-15%	0%	-10%
		% total ppn 65 or over in Odessa oblast	UKR Demographic passport 2013		20	3.00%	10%	0%	20%
		% total ppn 65 or over in Mykolaivska oblast	UKR Demographic passport 2013		20.5	6%	20%	0%	25%
		Unemployment rate 15-64 - %	Indexmundi	Country level - 2011	7	125%	250%	0%	150%
		Unemployment rate Kominternovskiy %	D2.1d - Tyli mezoregion		0.5	125%	250%	0%	150%
		Unemployment rate Berezivskiy %	D2.1d - Tyli mezoregion		2.2	125%	250%	0%	150%
		Unemployment rate Berezanskyi %	D2.1d - Tyli mezoregion		3.5	125%	250%	0%	150%
	WWTPs								
		Catchment basin size km2	Lagoons BRIEF / TB4		5420				
<b>Land Use</b>		Area total sq. km of Tyli mezoregion	D2.1d - Tyli mezoregion		4510				
	Agriculture	Agricultural Area total sq. km (of catchment basin)	Lagoons BRIEF / TB4		4086.68				
		Agricultural area total sq. km of Tyli mezoregion	D2.1d - Tyli mezoregion		3632				
		Agricultural Utilised area for organic farming in ha							
		Crops - sowing area km2 Kominternovskiy	D2.1d - Tyli mezoregion		819				
		Crops - sowing area km2 Berezivskiy	D2.1d - Tyli mezoregion		955				
		Crops - sowing area km2 Berezanskyi	D2.1d - Tyli mezoregion		567				
		Gross grain yield Kominternovskiy tons	D2.1d - Tyli mezoregion		124700				
		Gross grain yield Berezivskiy tons	D2.1d - Tyli mezoregion		165300				
		Gross grain yield Berezanskyi tons	D2.1d - Tyli mezoregion		92000				
	Agriculture								
		Productivity of cereals kg per ha Kominternovskiy	D2.1d - Tyli mezoregion		2480				

		Productivity of cereals kg per ha Berezivskyi	D2.1d - Tyli mezoregion		2660				
		Productivity of cereals kg per ha Berezanskyi	D2.1d - Tyli mezoregion		2260				
	Agriculture - livestock	Live bovine (cows) animals - total for Tyli mezoregion	D2.1d - Tyli mezoregion		11700				
		Live pigs - total for Tyli mezoregion	D2.1d - Tyli mezoregion		22800				
		Live goats, sheep - total for Tyli mezoregion	D2.1d - Tyli mezoregion		9900				
	Forest	Forestry sq. km							
	Hunting and fishing	Hunting and fishing sq. km							
	Settlements	Popn density inhabs/km2 in Odessa oblast	UKR Demographic passport 2013		71.9				
		Popn density inhabs/km2 in Mykolaivska oblast	UKR Demographic passport 2013		47.7				
		Popn density inhabs/km2 in Kominternovskyi	D2.1d - Tyli mezoregion		46.6				
		Popn density inhabs/km2 in Berezivskyi	D2.1d - Tyli mezoregion		21				
		Popn density inhabs/km2 in Berezanskyi	D2.1d - Tyli mezoregion		17.4				
	Heavy environmental impact	Heavy env impact sq km							
	Services and residential	Services and residential sq km							
		No visible use sq. km							
<b>Env protection expenditure</b>									
	Enviro protection expenditure – total	UAH per inhabitant							
<b>Env protection expenditure</b>	Industry	Percentage of GDP							
	General government	Percentage of GDP							
	Private and public env service providers	Percentage of GDP							
	Enviro protection expenditure – total	Percentage of GDP							

<b>VISTULA (Poland)</b>									
<b>Main Drivers</b>	<b>2<sup>nd</sup> level drivers</b>		<b>Data Source</b>	<b>Code</b>	<b>Baseline</b>	<b>BAU (2030)</b>	<b>Crisis</b>	<b>Managed Horizons</b>	<b>Set aside</b>
<b>Economy</b>	Fishing/shellfish						-50%	20%	40%
	Aquaculture						-50%	20%	0%
	GDP using PPS index		Eurostat 2011	NUTS 1	64	74%	-5%	85%	80%
	Tourism	Total nights spent	Eurostat 2011	NUTS 2 PL62	2470096	54%	-30%	80%	54%
		Total nights spent	Eurostat 2011	NUTS 2 PL63	5689466	12%	-30%	30%	12%
		No of bed places	Eurostat 2011	NUTS 2 PL62	37722	-44%	-60%	0%	-44%
		No of bed places	Eurostat 2011	NUTS 2 PL63	80178	-34%	-60%	0%	-34%
<b>Population</b>	Numbers								
	Numbers	Total resident popn	Eurostat 2011	NUTS 2 PL62	1453211	-3.0%	-35%	3%	-20%
		Total resident popn	Eurostat 2011	NUTS 2 PL63	2279500	3.0%	-30%	6%	-20%
		Total popn	Europop 2008	NUTS 2 PL62	1425000	-3.0%	-35%	3%	-20%
		Total popn	Europop 2008	NUTS 2 PL63	2223000	3.0%	-30%	6%	-20%
	Demography	Crude popn growth rate - %	EuroPop 2008	NUTS 2 PL62		-1.5%	-15%	1%	-10%
		Crude popn growth rate - %	Europop 2008	NUTS 2 PL63		1.4%	-10%	1%	-10%
		% total popn 65 or over	Europop 2008	NUTS 2 PL62	11.8	90%	200%	45%	120%
		% total popn 65 or over	Europop 2008	NUTS 2 PL63	12.3	70%	150%	35%	100%
		Employment rate 15-64 - %	Eurostat 2011	NUTS 2 PL62	54.9	22%	-20%	35%	5%
		Employment rate 15-64 - %	Eurostat 2011	NUTS 2 PL63	59.1	22%	-20%	35%	5%
		Unemployment rate total yo %	Eurostat 2013	NUTS 1	10.7	4%	100%	2%	4%

		Unemployment rate <25 yo %	Eurostat 2013	NUTS 1	27.5	70%	100%	30%	60%
	Waste water treatment	Population served by wwtp	PL Gov Stats 2012	W-MAZURSKI E	1064891				
		Industrial and municipal wwtp	PL Gov Stats 2012	W-MAZURSKI E	249				
		Population served by wwtp	PL Gov Stats 2012	Pomorskie	1873934				
		Industrial & municipal wwtp	PL Gov Stats 2012	Pomorskie	221				
<b>Land Use</b>		Area total use sq. km	Eurostat 2009	NUTS 2 PL62	24010	-5%	-5%	-5%	-5%
		Area total use sq. km	Eurostat 2009	NUTS 2 PL63	18171	-5%	-5%	-5%	-5%
	Agriculture	Agricultural Area total sq. km	Eurostat 2009	NUTS 2 PL62	11416	5%	-10%	0%	-50%
		Agricultural Area total sq. km	Eurostat 2009	NUTS 2 PL63	8276	5%	-10%	0%	-50%
	Agriculture	Area excl fallow, kitchen sq. km	Eurostat 2009	NUTS 2 PL62	10628	25%	-25%	30%	-50%
		Area excl fallow, kitchen sq. km	Eurostat 2009	NUTS 2 PL63	7782	20%	-25%	25%	-50%
	Agriculture	Utilized area ha	Eurostat 2007	NUTS 2 PL62	933850	25%	-25%	30%	-50%
		Utilized area ha	Eurostat 2007	NUTS 2 PL63	733560	20%	-25%	25%	-50%
		Fallow & abandoned land sq. km	Eurostat 2009	NUTS 2 PL62	747	-25%	100%	-30%	50%
		Fallow & abandoned land sq. km	Eurostat 2009	NUTS 2 PL63	366	-20%	100%	-25%	50%
		Crops (cereal & rice) yield 100kg per ha	Eurostat 2009	NUTS 2 PL62	35	40%	-40%	50%	40%
		Crops (cereal & rice) yield 100kg per ha	Eurostat 2009	NUTS 2 PL63	36	45%	-45%	55%	45%
	Agriculture	Irrigation - ha total irrigable and irrigated	Eurostat 2007	NUTS 2 PL62	16630	140%	-20%	200%	75%
		Irrigation - ha total irrigable and irrigated	Eurostat 2007	NUTS 2 PL63	7790	-12%	-30%	0%	-25%
		Utilised agricultural area organic in ha	Eurostat 2007	NUTS 2 PL62	16460	200%	-50%	500%	400%

		Utilised agricultural area organic in ha	Eurostat 2007	NUTS 2 PL63	12090	100%	-50%	250%	200%
	Agriculture - livestock	Live bovine animals	Eurostat 2011	NUTS 2 PL62	435000	40%	0%	50%	-20%
		Live bovine animals	Eurostat 2011	NUTS 2 PL63	187900	-15%	-30%	0%	-40%
	Forest	Forestry sq. km	Eurostat 2009	NUTS 2 PL62	7168	0%	-20%	5%	25%
		Forestry sq. km	Eurostat 2009	NUTS 2 PL63	6353	0%	-20%	5%	25%
	Hunting & fishing	Hunting and fishing sq. km	Eurostat 2009	NUTS 2 PL62	595	-5%	0%	5%	-10%
		Hunting and fishing sq. km	Eurostat 2009	NUTS 2 PL63	186	-5%	0%	5%	-10%
	Settlements	Popn density inhabs/km2	Eurostat 2011	NUTS 2 PL62	60.1	4%	-15%	6%	-20%
		Popn density inhabs/km2	Eurostat 2011	NUTS 2 PL63	124.5	9%	-15%	14%	-10%
	Heavy environmental impact	Heavy env impact sq. km	Eurostat 2009	NUTS 2 PL62	465	5%	40%	-20%	-50%
		Heavy env impact sq. km	Eurostat 2009	NUTS 2 PL63	455	5%	40%	20%	-50%
	Services & residential	Services & residential sq. km	Eurostat 2009	NUTS 2 PL62	2170	-5%	-20%	5%	-10%
		Services & residential sq. km	Eurostat 2009	NUTS 2 PL63	1301	5%	-20%	10%	-5%
		No visible use sq. km	Eurostat 2009	NUTS 2 PL62	2196	5%	15%	-5%	50%
		No visible use sq. km	Eurostat 2009	NUTS 2 PL63	1600	5%	15%	-10%	50%
<b>Env protection expenditure</b>	Enviro protection expenditure - total	Euro per inhabitant	Eurostat 2010	NUTS 1 PL	299				
<b>Env protection expenditure</b>	Industry	Percentage of GDP	Eurostat 2011	NUTS 1	0.81%	-18%	-60%	10%	20%
	General government	Percentage of GDP	Eurostat 2011	NUTS 1	0.53%	85%	-20%	100%	120%
	Private & public env service providers	Percentage of GDP	Eurostat 2011	NUTS 1	1.16%	350%	-5%	400%	400%
	Enviro protection expenditure - total	Percentage of GDP	Eurostat 2011	NUTS 1	2.50%	100%	-40%	180%	200%