

## Latvia Case Study

### Municipal coastal governance process development: Salacgriva rural territory

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**A SYSTEM APPROACH FRAMEWORK FOR  
COASTAL RESEARCH & MANAGEMENT**



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# HIGHLIGHTS I

- System Analysis Framework (SAF) as the general frame was applied to create, based on public/stakeholders involvement/recomendations, better coastal development planning and **coastal governance processes innovations** at the local level for both:
  - **sectorial** integrated coastal governance (ICZM) **application**, and
  - **integrative application** as for sectorial ICZM to be integrated into formal development planning and process (horizontal and vertical intergation);
- Designed coastal **science-governance interface** model with particular **ICZM INSTRUMENTS** for case territory (to be transferable to all coastal municipalities in Latvia) – **all products as national inovations in Latvia**;
- e.g. SAF methodology was applied to governance PROCESS case to create local coastal municipality owned **COASTAL INFORMATION SYSTEM as pre-condition for decision making** – based on social-ecological system (SES, incl. also governance system/resources) modelling and later adaptation to national/local information possibilities/needs:



# HIGHLIGHTS II

## **COASTAL INFORMATION SYSTEM as pre-condition for decision making:**

### **-1- Coastal Outlook**

Municipal level Coastal SES Statuss and Governance (Thematic) Report !  
Content/Process Guidelines – to be basic Source Book/Report/data for any ICZM  
and OTHER sectors decision making/planning

### **-2- Coastal Municipal Monitoring System**

Municipal Coastal Sustainable Development Monitoring Programme:

- for regular/actual info provision and also 2-4 years Coastal Outlook update, incl.  
and to be used separately also, the following:

- Coastal Indicators System (incl. list of necessary indicators within SES frame)
- Public Coastal Monitoring Programme Outline (**Citizen science** approach)

### **-3- Integration Guidelines**

Blueprint for data/monitoring/procedures integration into mandatory municipal  
planning PROCESS AND DOCUMENTS – Municipal Development Program (for 7  
years period with annual upgrade) and also Spacial Planning/spatial plan



# RATIONALE FOR THE CASE STUDY-I

**Case study** is orientated to coastal **development and governance** - improvement of coastal governance system based on collaboration of the stakeholders as the key driving force for integrated and sustainable coastal zone management (protection, use and development of coastal socio-economic, natural and cultural resources).

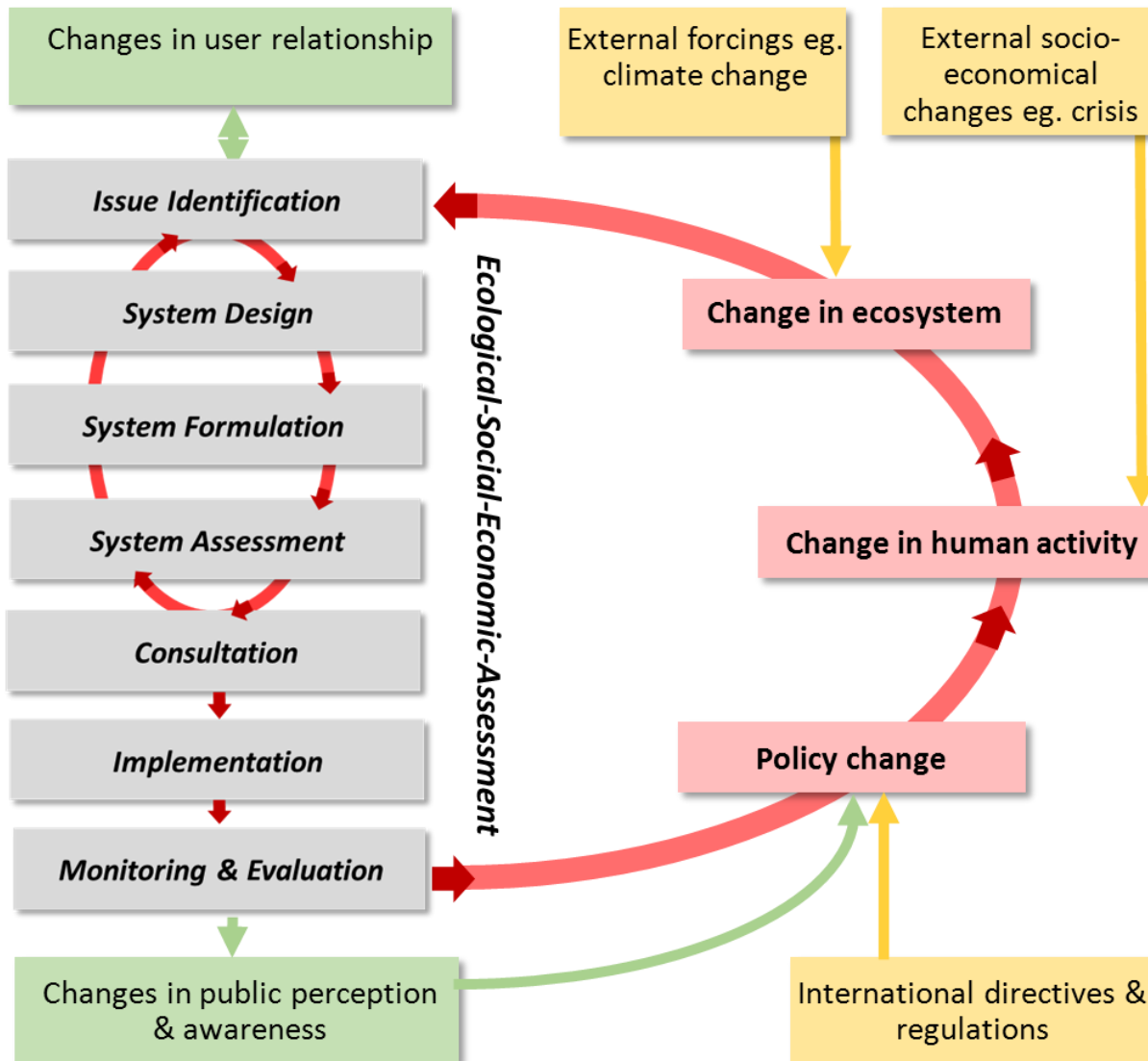
Thus, overall objective within Salacgriva case is to adapt and test the general SAF methodology for application in municipal governance sector, understanding coastal areas as both the national (state), municipality and local communities' interest territories.

**We shall find such coastal area and coastal resources governance models, which are adequate and well working in case of long coastline rural local municipalities with limited human, administrative and financial etc. capacities and instruments, in order to govern and develop sustainably such complex socio-ecological systems as the coastal areas are**

**Important Latvia feature is** lack of reliable and in-time information as the critical obstacle for coastal governance: **no reliable information – no real governance**



# Rational for case study – II: SAF concept with steps and linkages





# GOALS AND AIMS

- to **establish interface** between SAF methodology and coastal & development planning methodology and plans' supervision - applying of coastal information systems (coastal indicators systems) developed in accordance with SAF methodology
- to **demonstrate the transition process** from separate isolated research (devoted to single issue) to unified comprehensive multi-disciplinary coastal research;
- to create the systemic **governance set of tools** which can be used for understanding coastal state, projecting future state and establishing necessary coastal activities. Tools should be at low cost regarding their use and should be implemented based on efforts of municipal specialists and local stakeholders, as possible (minimizing necessity for outside experts and skills);
- to **demonstrate the synergy** between academic research and citizens science.



# MATERIALS AND METHODS

1. Identification of key SES elements characterising the case study site
2. Establishing current practice status of **coastal governance – process, content and stakeholder segments** - definition of coastal governance scenarios and developments necessary
3. Application of SAF methodology for **research-and-development** study
4. **Research** - fact finding mission for coastal areas as **SES**:
  1. establishing of nature science data characterizing long-term changes on the coast (e.g. coastal erosion, number of strong wind days annually etc),
  2. establishing of socio-economic science data
  3. establishing of governance/admin science data
5. **Development** – design and elaboration, and a probation where possible of **development (governance) instruments innovated**





# **DESCRIPTION OF THE SITE**



# TASK 5.4 CSS

## COASTAL MUNICIPALITY GOVERNANCE



• Salacgrīva  
municipality Case





# SALACGRIVA TOWN AND SALACA RIVER







## TASK 5.4

# COASTAL MUNICIPAL GOVERNANCE CASE

### Municipal pre-conditions:

- One of the most advanced environmental governance in Latvia, having;
- Green declaration (2010), Climate change adaptation strategy (2011) etc
- Various, also non-traditional, top-down and bottom-up stakeholders facilitation/participation mechanisms/procedures

### Major local coastal issues:

- Insufficient coastal accessibility of beach & amenities and unsatisfactory administration of anthropogenic pressures in dune zone
- Climate change induced sea-level rise, storm surges and resulting risk of flooding and destruction of households/infrastructure

### Major challenges:

**Adapting to climate change while simultaneously enabling multiple uses in the Gulf of Riga**

### Focus:

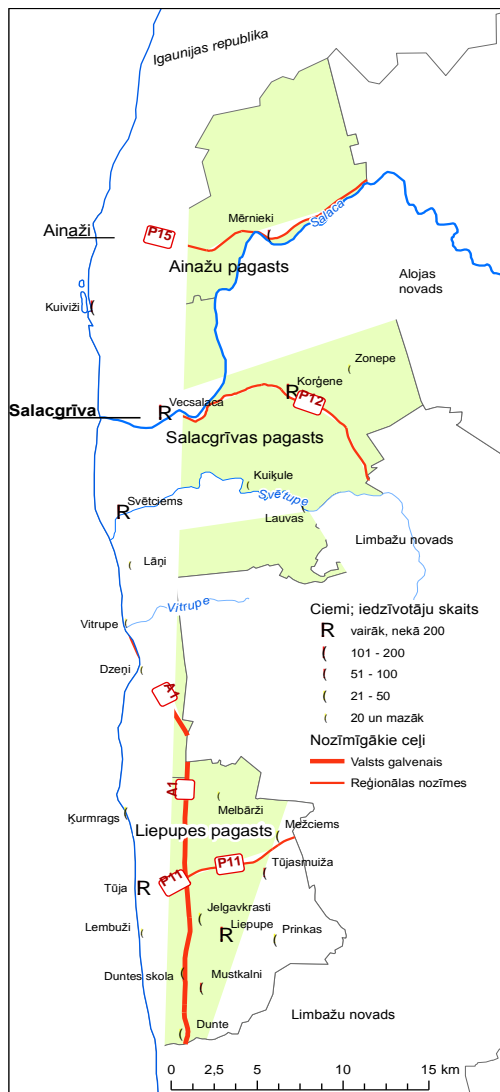
- To explore and evaluate **different municipal governance approaches**
- To integrate the SAF/ICM into **local spatial planning.**



# SALACGRIVA CASE

## Salacgriva rural municipality: related characteristics

- Located approx. **only 50–100 km** from capital Riga with **700 000** inhabitants, at north bordering with Estonia;
- Long shore line – **55 km (10%** - whole Latvia coastline);
- Placed on **5-15 km broad coastal strip**, area – 638 km<sup>2</sup>;
- Permanent inhabitants – **7574 (01.01.2017)** and **~36%** in Salacgriva town;
- Population density in rural areas (without towns) – less **7 inhabitants per km<sup>2</sup>**, what is almost **3 times lower** than average in the Latvia;
- 2009 admin reform – **3 small** coastal municipalities united
- Riga – Tallinn **highway located along/close** the coast and new Baltic **Railway** line Tallinn – Warsaw in coming years will be built **via municipality** along coastline too.





# SALACGRĪVA MUNICIPALITY: IN BRIEF

Total area of the region	637,99 km <sup>2</sup>
Neighboring areas	Municipalities of Limbaži, and Aloja , Estonia Republic
Inland waters	The lower part of River Salaca (28,3 km), Svētupe (21,5 km), Jaunupe (4,6 km), other small rivers. No significant inland water bodies.
Administrative center	<b>Salacgrīva, 3130 inhabitants, 103 km from Riga</b>
The territorial distribution of the region	Ainaži, Rural municipality of Ainaži, Salacgrīva, Rural municipality of Salacgrīva and Rural municipality of Liepupe.
The number of population	<b>In 2015 there were 8658 inhabitants;</b> 517 in Rural municipality of Ainaži (without Ainaži), 1977 inhabitants in Rural municipality of Liepupe, 2249 inhabitants in Rural municipality of Salacgrīva (without Salacgrīva), 855 Ainaži, 3060 in Salacgrīva.
Population density	<b>14,8 residents per/ km<sup>2</sup></b>
Transportation infrastructure	Motorways crossing the region: A1 (E67) Rīga (The Lake Baltezers)–Estonian border (Ainaži), P11 Kocēni–Limbaži–Tūja, P12 Limbaži–Salacgrīva, P15 Ainaži–Matīši. Port in Salacgrīva.
Significant business areas	<b>Port complex of Salacgrīva, JSC „Brīvais vilnis” (fish processing), metal processing, wood-processing, agriculture and hospitality industry.</b>
Unemployment rates	By the beginning of July, 2013, the unemployment rate in the region was 6,2% from economically active population, which is less than country average (7,3%)



# MUNICIPAL PLANNING CASE: COASTAL ROLE

## Municipal participatory governance resources

- Political will of the Municipal Council expressed in “Declaration for the Green Region» etc. documents
- Northern Vidzeme Biosphere reserve (only in Latvia) with central seat in Salacgriva
- village elders institution (bottom-up election) development
- village NGOs development, networking and projects with municipal Council support
- NGO/youth, corporate etc consultative councils at the municipality



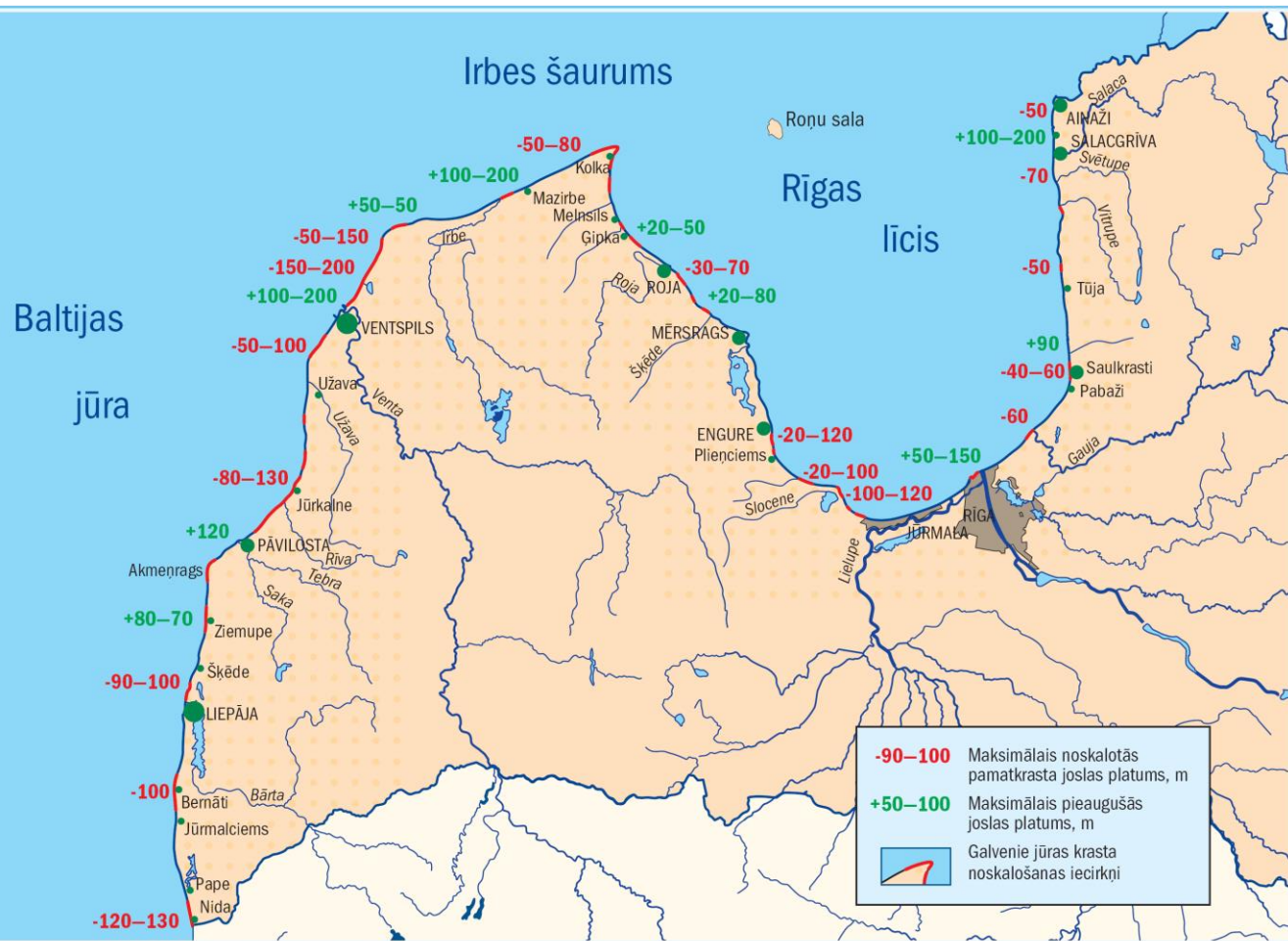
## BOTTOM-UP GOVERNANCE CAPACITIES: INVOLVING DIFFERENT STAKEHOLDER GROUPS INTO LOCAL GOVERNANCE PROCESSES

- Business advisory council
- Village elder's council:
  - bottom-up elected elders from several villages
- Youth advisory council:
  - more than 50% of their recommendations for monthly Municipal Council meetings Agenda has been accepted
- Village based local development NGO's:
  - raising funds for small local social and development projects;
- Municipality do co-finance most of local NGO projects from municipal budget
- Fishermen and anglers Advisory Council





# SEA COAST CHANGES DURING LAST 60-70 YEARS (Eberhards, 2004)



amatkrasta summārās pārmaiņas pēdējo 60–70 gadu laikā.

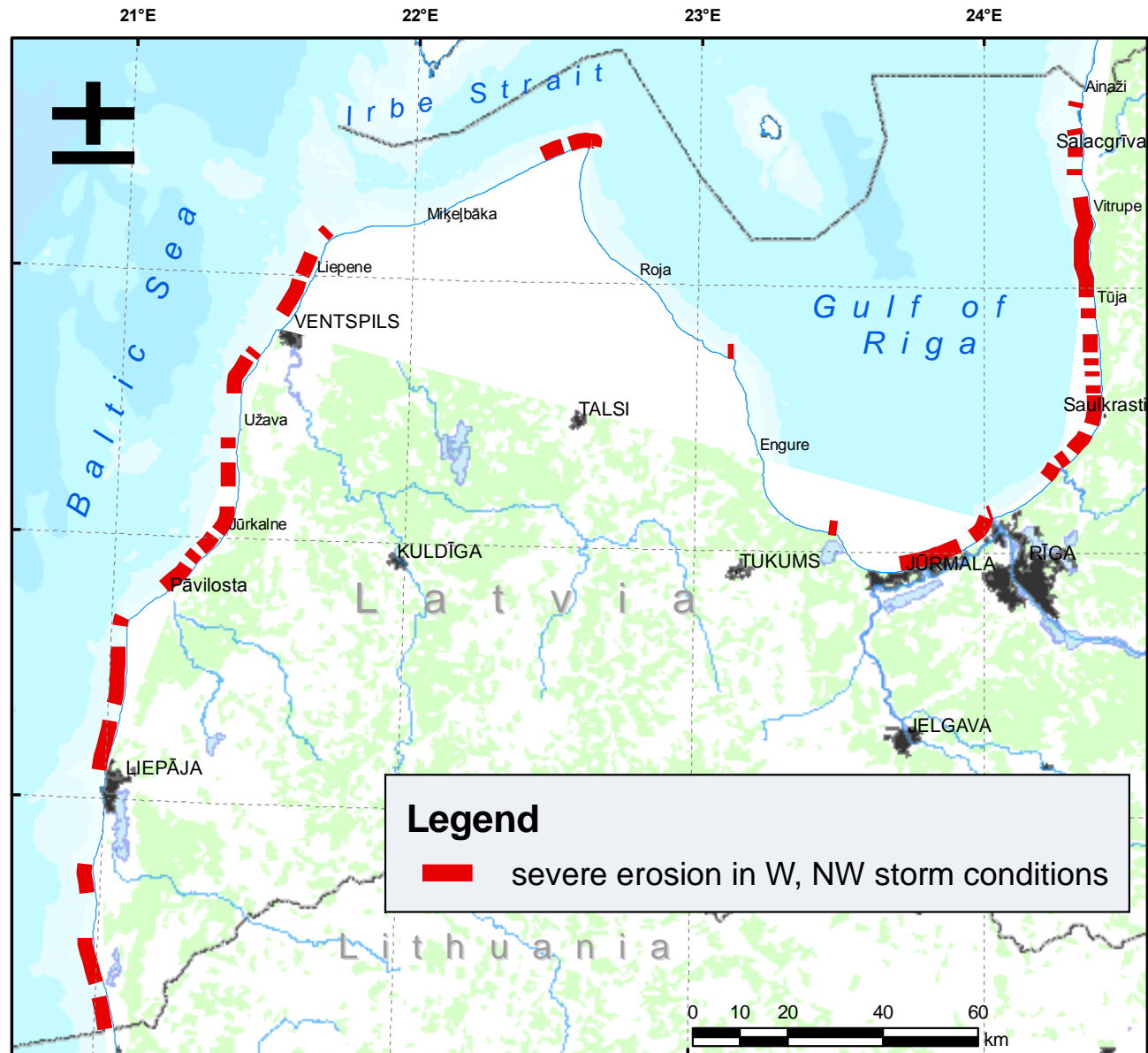


# WIND DIRECTIONS AND SEVERE EROSION ZONES

(Eberhards et al, 2006)

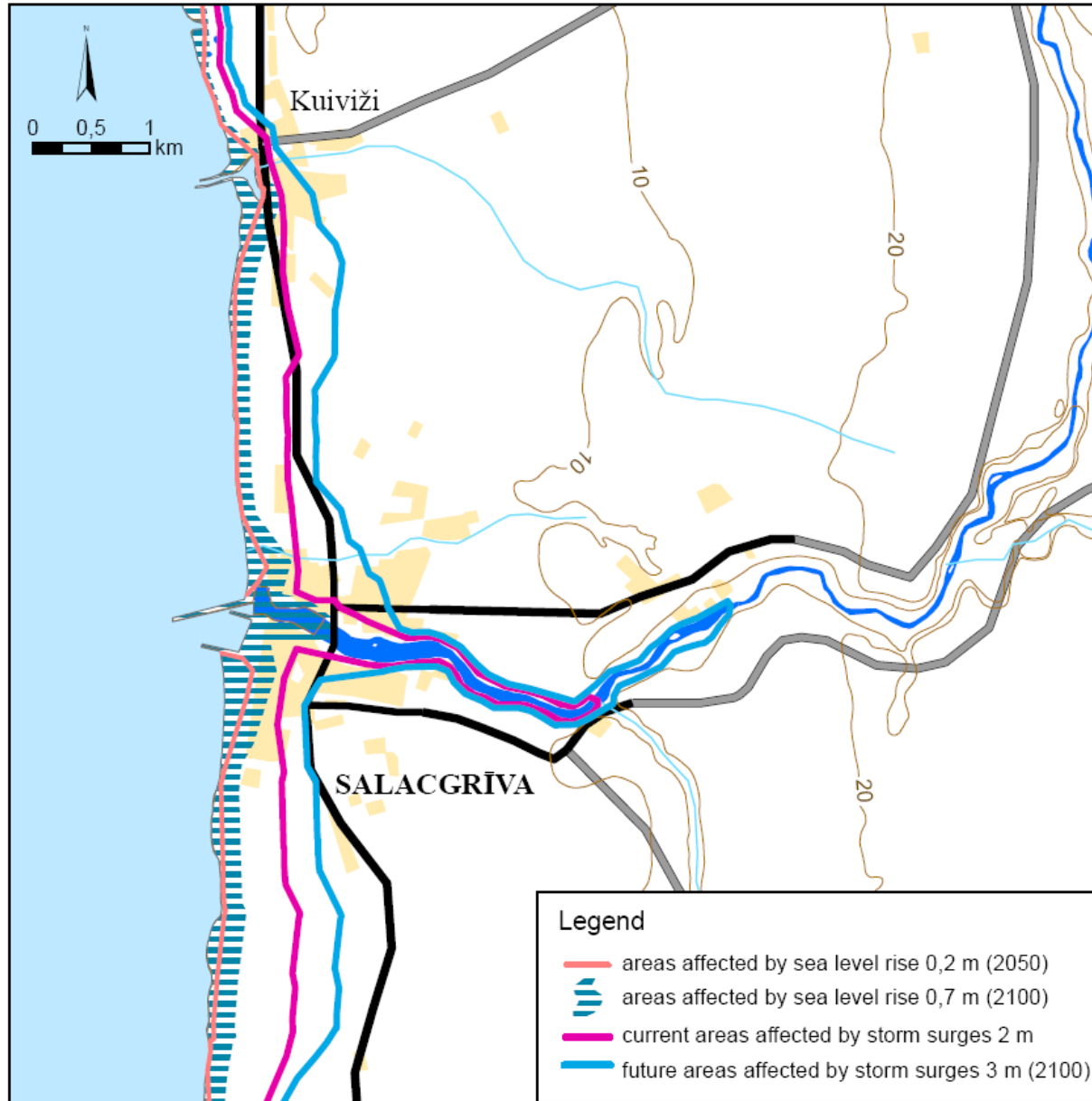
Main risk zones are at the open sea and Riga gulf from saukrasti to Ainazi

(incl. Salacgriva municipality)





# SEA LEVEL CHANGES PREDICTION 2050-2100.G.

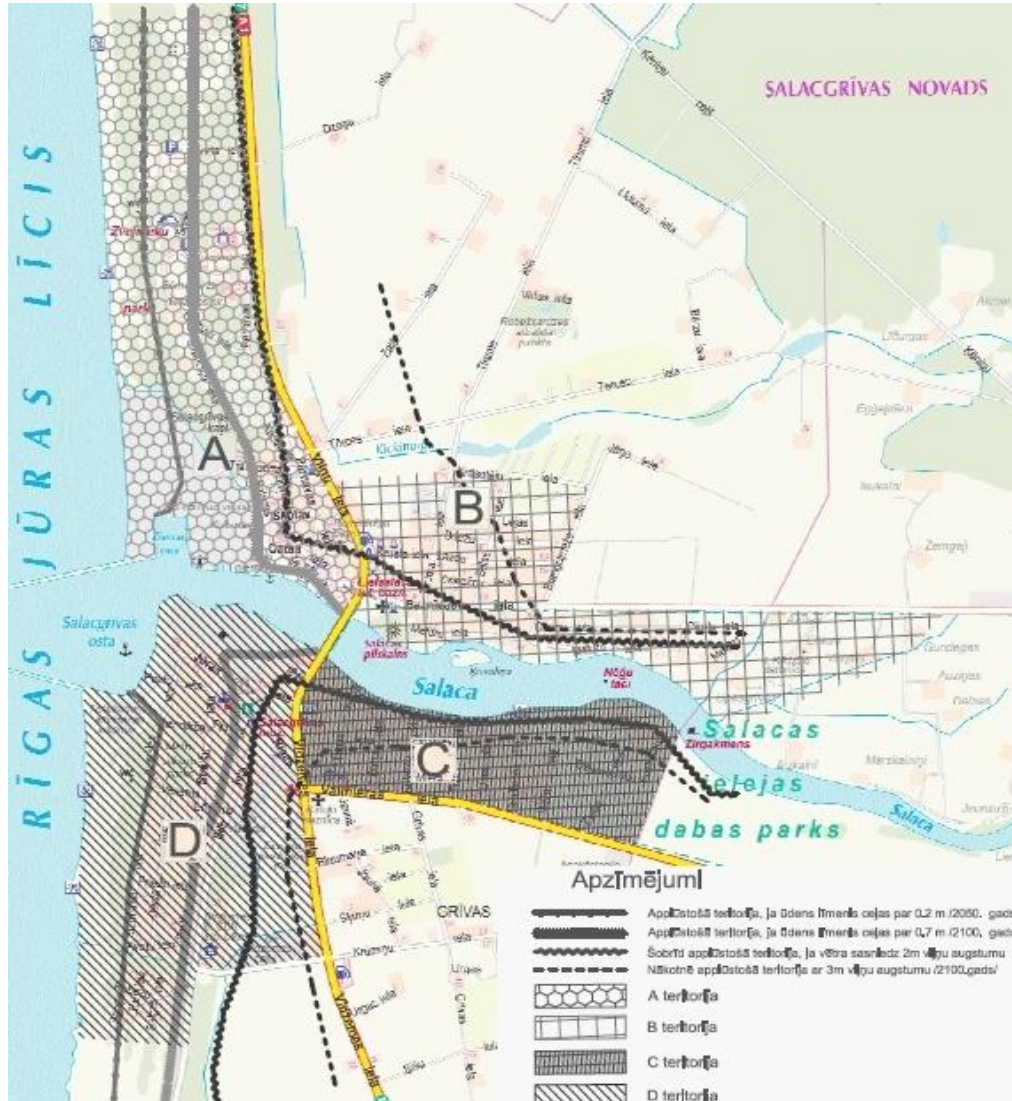


From Potsdam  
Climate change  
institute materials





# TERRITORIES UNDER FLOODING RISK: SALACGRIVA TOWN





# SALACGRIVA MUNICIPALITY COUNCIL GREEN MUNICIPALITY DECLARATION

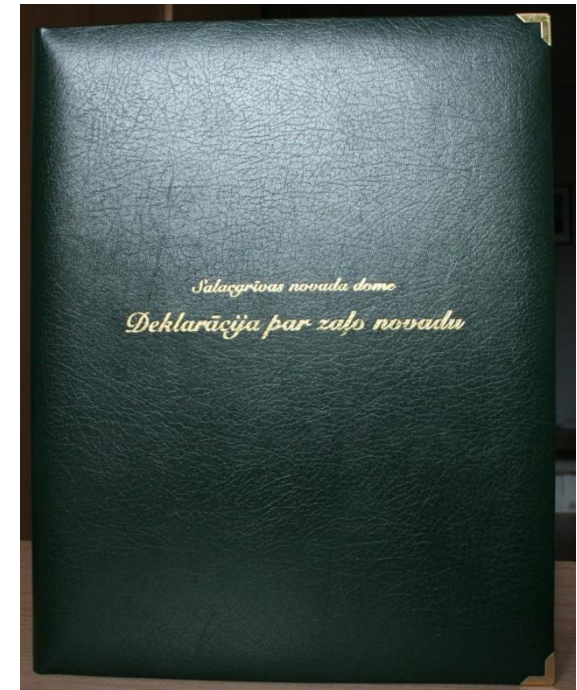
Declaration unanimously approved on July 21st, 2010 by the Salacgriva Municipality Council.

## Declaration on Green municipality

The declaration is made in order to involve all municipal interest groups, to encourage and promote a healthy, economic, natural and man-friendly sustainable lifestyle and economic activities.

We have decided to focus on environmental issues and on promoting sustainable development in our region. Everyone of us has a desire to live in a clean and orderly environment.

We can be proud by living in northern seaside with gorgeous and biologically diverse rivers, relatively undisturbed forests, North Vidzeme Biosphere Reserve.





# THE ESSENCE OF THE DECLARATION

**To realize our green decision, we need to:**

- integrate Green approach into Development strategy and all municipal planning documents and
- to create simple, live and understandable idea and/or action plan, that every one can participate and to be stakeholder for joint development







# GREEN MUNICIPALITY – GREEN ENERGY

- There is Sun garden open
  - near Munchausen museum in Dunte Manor
  - 216 solar panels installed with total capacity in sunny days of 42 kilowatts

Both projects financed by Climate Change Management Financial Instrument

- Solar collectors installed on Salacgriva municipality buildings
  - Sport Complex Admin Building,
  - Kindergarten,
  - Secondary School





# GREEN MUNICIPALITY

Salacgriva children's playground:

- three alternative energy lamps,
- wind and solar energy
- illumination regardless of the weather and electricity suppliers
- 2008-2009, with pay-off within three years







# SEA HEATPUMP PROJECT IN SALACGRĪVA

CO<sub>2</sub> emissions reduced twice : from no 508,72 to 265,3 tons/year

Sea heat into Centralized Heat Supply System for Salacgriva town

municipal budget institutions:

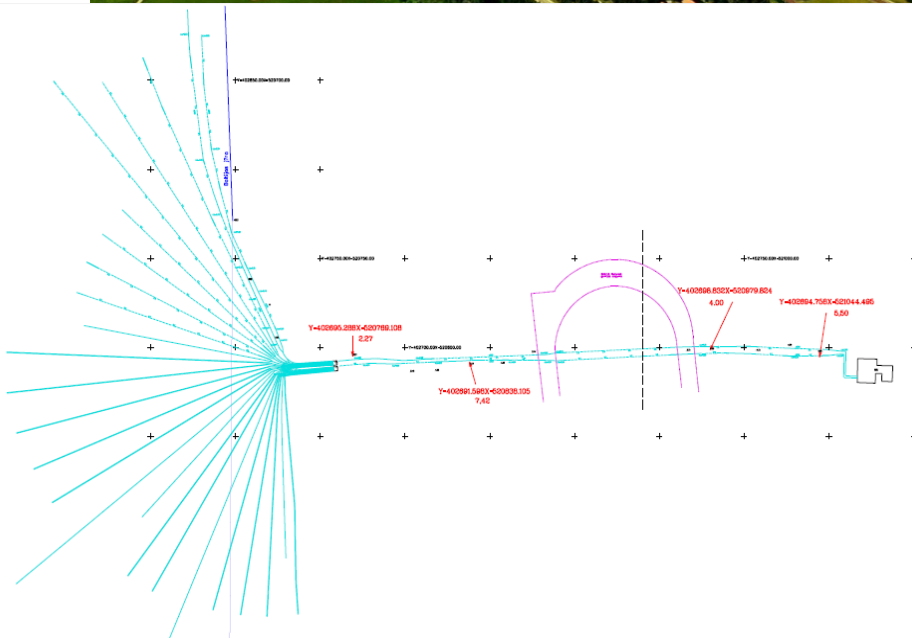
- school,
- kindergarten,
- sport complex.

Main characteristics:

- total heated area - 10,670sqm
- 3 heat pumps with a total capacity of 1,18 MW
- Heat collector total length 10100 m

**Total cost 1 090 947 Euro**

*November 2009 - April 2011.*





# COASTAL GOVERNANCE SCENARIOS

Based on studies and current research outcomes the following basic/general **Municipal Governance Scenarios** are:

- 1. Base (BAU – business as usual) governance scenario** - in general corresponds to **minimum requirements** defined by Latvian development planning/management legislation;
- 2. Top-down governance scenario** - The ICZM is integrated within the general municipal governance environment (content, process and products); The municipality takes full responsibility for coastal governance, with at least formal/mandatory involvement of local stakeholders;
- 3. Bottom-up governance scenario** - In a great extent the coastal governance is implemented by local coastal stakeholders in partnership with municipality – **ICZM function delegation approach**;
- 4. Outcome - Collaborative governance scenario.**



# **APPLICATION OF SAF METHODOLOGY STEP- BY-STEP**

## **ISSUE IDENTIFICATION**



# STEP 1. ISSUE IDENTIFICATION

- **Problems** in coastal area identified and link with **Human Activities** established
- Problems **relationships with ecosystem services** established
- Stakeholders **involvement process provided**
- **Institutional mapping** done, personalized stakeholders established
- **DPSIR analysis** provided
- **CATWOE model** developed
- **Social and Economic components relevant** for the Issue **identified**
- **Priorities of village level stakeholders established** – analysis of implemented local projects (LEADER programme), they relations to the coastal state



## STEP 2. SYSTEM DESIGN

Elements and material flows within Nature and Governance subsystems established (as the example below)

SES components	Material flows	External Hazards
<b>Ecological</b>		
<ul style="list-style-type: none"> <li>• shore line</li> <li>• beach and coastal dunes</li> <li>• valuable biotopes and habitats</li> <li>• coastal forests</li> <li>• marine resources (fish, algae)</li> <li>• water quality</li> <li>• weather conditions</li> <li>• sand and stones</li> </ul>	<ul style="list-style-type: none"> <li>• marine litter</li> <li>• nutrients flow (by natural systems: rivers etc.)</li> <li>• sediments (sand)</li> <li>• coastal erosion</li> <li>• floods</li> <li>• wind falls</li> </ul>	Climate risks (storms, extreme weather conditions, floods, rain falls) Ship pollution Algae blooming Coastal fires (forests, reeds)
<b>Governance</b>		
<ul style="list-style-type: none"> <li>• local administration capacity</li> <li>• local regulation acts</li> <li>• specific areas specialists (environmental/nature/culture)</li> <li>• coastal Information system</li> <li>• participation mechanisms (elderly institution; councils etc)</li> <li>• NGOs (horizontal, village level)</li> <li>• other governance instruments</li> </ul>	<ul style="list-style-type: none"> <li>• Information flow and communication</li> <li>• Environmental Communication</li> <li>• Specialists (on environment, coast, nature, tourism)</li> </ul>	Administrative Territorial reform Conflict between local and national development interests Brains outflow (loss of experienced people)



## STEP 2. SYSTEM DESIGN

- **Conceptual model development: background**

The central issue of the overall system **Unsustainable governance of coastal resources**

- **What comprises coastal resources?**

The approach had been based on environmental governance goals, namely, the **coastal resources are characterized through: protection of biological diversity, environmental quality and sustainable use of natural resources**

- **System components**

**Governance subsystem** is added to SES. Governance subsystem had become a central block allowing to address an issue of “unsustainable governance of coastal resources”

- **Flows conceptualization**

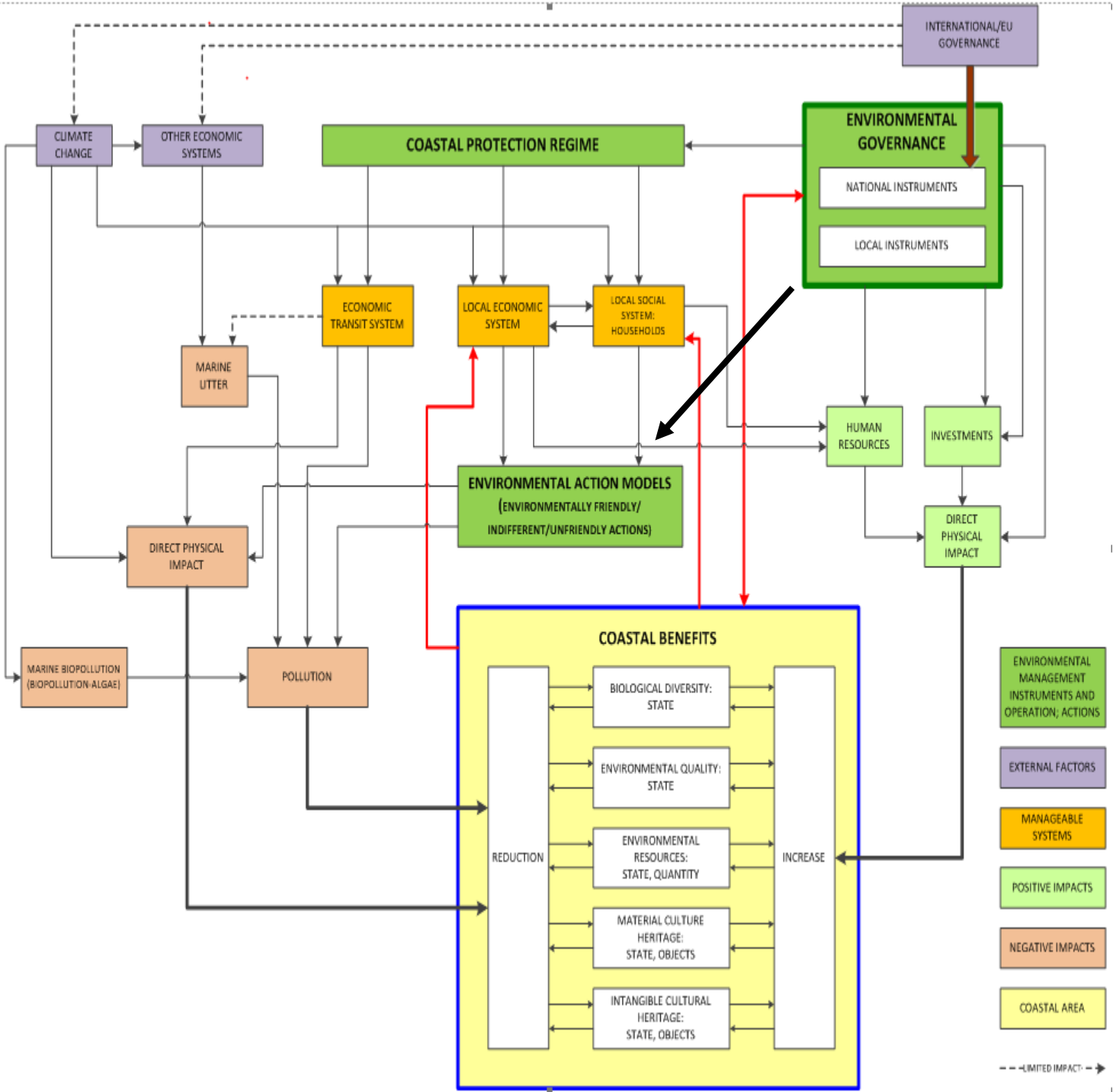
- **“Pollution flow”** impact is negative

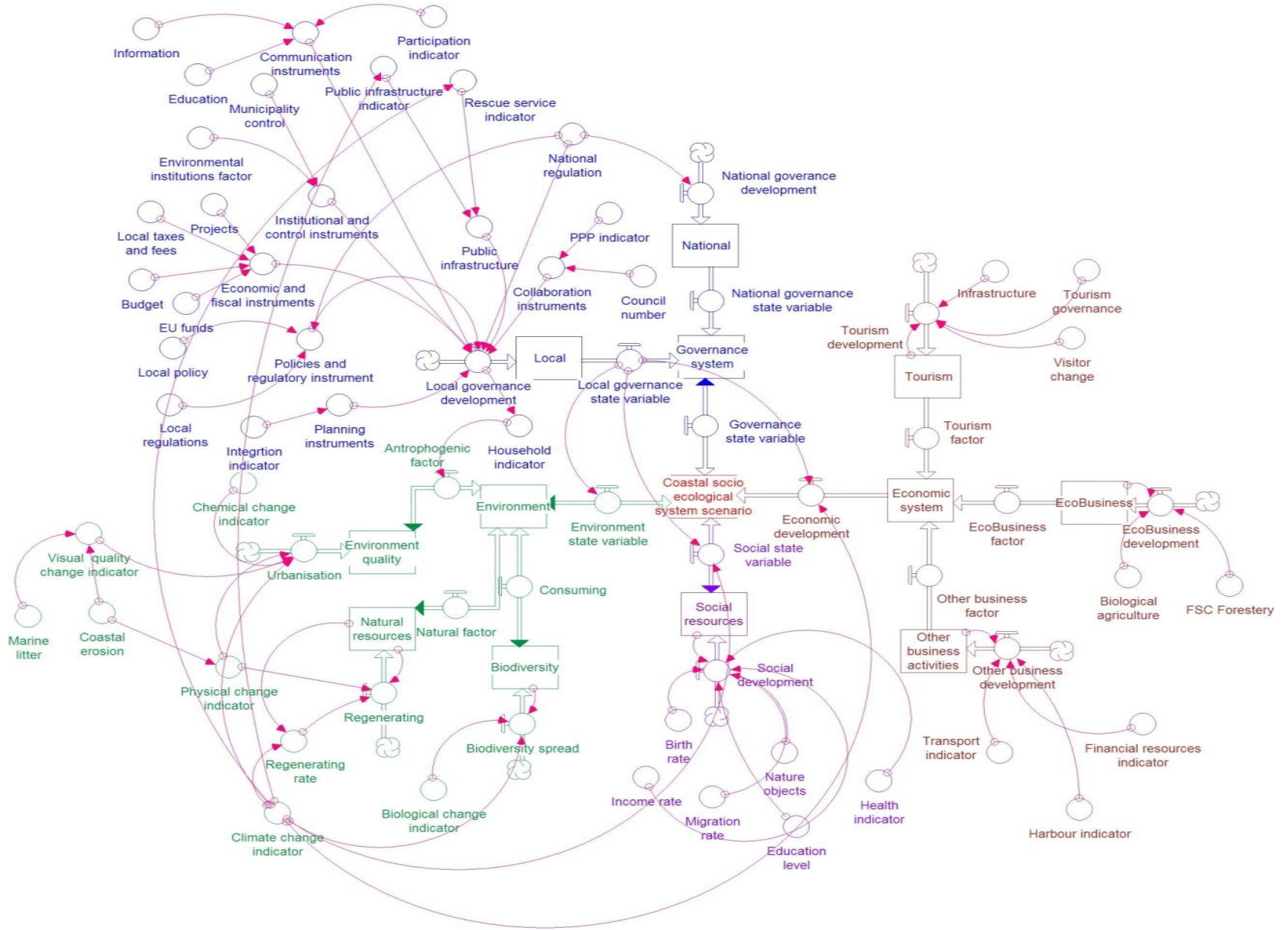
- **“Direct physical impact”** might be positive or negative

- **Environmental actions models**

Certain factors of the system which influence system behaviour is put in the centre (see next slides)

- **Impacts of external subsystems** (see next slides)









# TRANSFER FROM SYSTEM DYNAMIC MODEL (SDM) TO COASTAL INDICATORS SYSTEM

The SDM has allowed to establish the **optimum number parameters** set (necessary and sufficient) to characterize the state of the coast in rural coastal municipalities.

Continuing, the analysis of the SDM have allowed

- (i) to understand in details the on-going natural (ecological) and socio-economic processes in the typical Latvia coastal areas and their interaction,
- (ii) to understand the necessary framework for the interface to link science - governance decision making.

Thus, **the main objective for the next step** was to perform the transfer from mostly research (as the development, modelling and analysis of SDM) to practical improvement of the coastal governance.



**STEP 3&4**  
**SYSTEM FORMULATION AND APPRAISAL**  
**COASTAL INDICATOR SYSTEM AS THE SAF TOOL**



# INDICATORS SYSTEM DEVELOPED IN ACCORDANCE WITH SAF

- **Based on system dynamic model**
- **Algorithm developed how to transfer model's parameters to Indicators of the indicator system**

We have elaborated the approach how the system dynamics model can be translated to coastal indicators system.

**Important, that indicators system is both information flows system and modelling tool, well understandable by stakeholders, as the tendencies in indicators values allows to project future state.**

Indicators come from values and create values (*indicators measure the parameters which are important for local society and consensus about new indicators means recognition by stakeholders new values*)

Cost of indicators system can be lowered by involving in their measurement both local municipal specialists and stakeholders groups (public monitoring, citizens science).



# TRANSFER FROM SYSTEM DYNAMIC MODEL (SDM) TO COASTAL INDICATORS SYSTEM (CIS)

## Coastal Indicators System

CIS is designed for coastal long-term planning and planning documents (coastal governance strategy, thematic plan etc.) due to observe sustainability and sustainable development. With minimal transformations the developed for Salacgriva municipality system can be adapted for other coastal municipalities of Latvia.

### **The transforming of the SDM to CIS was done based on the following principles:**

- evaluating the dynamism of SDM parameters and including in the CIS those parameters with sufficient dynamics;
- evaluating regular, reliable and on coastal area applicable data obtaining opportunities from publicly available data sources or by applying other direct methods for data obtaining, incl. citizen science;
- including indicators which provide a link with the Salacgriva municipality long-term sustainable development strategy till 2030 and mid-term municipal development programme;
- evaluating necessity of additional indicators to characterize the coastal natural- socio economical system in the more detailed manner based on the capitals of sustainable development.



# CLARIFICATION OF POLICY ISSUES AND CAUSE EFFECT RELATIONS

- **16 sectorial problems** had been identified in given coastal territory
- Matrix of relationships among identified problems established (*direct, indirect and explicit, less explicit links*)
- Analysis of their structure had allowed to conclude on **3 generic type problems:**
  - Insufficiently managed low density territories,**
  - Low environmental management/ governance capacity**
  - Limited coastal communication**



# PROBLEMS: MATRIX OF RELATIONSHIPS

3– direct, explicit link; 2 – direct, less explicit link; 1 – indirect link; 0 – unclear link

Nr.	Problema\Respective Nr.of related problem	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.	18.	19.	Σ
1.	Restricted access to sea		3	3	0	0	2	0	1	0	0	0	1	2	1	3	3	2	0	3	24
2.	Coastal erosion	3		0	1	3	2	1	0	0	0	2	0	1	1	3	1	3	3	2	26
3.	Access of coast for people with special needs	3	0		0	0	0	0	1	0	0	0	0	1	0	1	2	3	0	1	12
4.	Coast erosion	0	1	0		3	1	1	1	0	0	2	1	2	3	0	1	1	1	1	19
5.	Over flooding during storms	0	3	0	3		1	2	1	0	0	3	1	3	3	0	1	0	1	1	23
6.	Risks to valuable biotopes	2	2	0	1	1		0	0	2	2	0	0	1	1	0	1	2	3	3	21
7.	Sea water quality	0	1	0	1	2	0		2	2	3	2	0	3	0	2	1	0	1	0	20
8.	Human safety in bathing /swimming places	1	0	1	1	1	0	2		1	2	1	1	3	0	3	0	3	0	1	21
9.	Nutrients pollution from rivers	0	0	0	0	0	2	2	1		2	1	2	2	1	0	0	1	2	1	17
10.	Individual households' wastwaters	0	0	0	0	0	2	3	2	2		0	0	2	0	3	1	3	2	2	22
11.	Potential pollution form industrial sites	0	2	0	3	3	0	2	1	1	0		0	2	1	0	1	0	1	0	17
12.	Forest damage	1	0	0	1	1	0	0	1	2	0	0		0	2	1	2	1	1	0	13
13.	Marine litter	2	1	1	2	3	1	3	3	2	3	2	0		0	2	0	1	2	1	29
14.	Risks to nature and culture capital	3	2	0	3	3	1	0	0	1	0	1	2	0		0	2	3	2	3	22
15.	High local seasonal pressures	3	3	1	0	0	0	3	3	0	3	0	1	2	0		0	1	1	0	21
16.	Construction of residential buildings on coast	3	1	2	1	1	1	1	0	0	1	1	2	0	1	0		2	1	2	20
17.	<b>Insufficiently managed low density territories</b>	<b>2</b>	<b>3</b>	<b>3</b>	<b>1</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>3</b>	<b>1</b>	<b>3</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>3</b>	<b>1</b>	<b>2</b>		<b>3</b>	<b>3</b>	<b>32</b>
18.	Low environmental management/ governance capacity	0	3	0	1	1	3	1	0	2	2	1	1	2	2	1	1	3		2	26
19.	Limited coastal communication	3	2	1	1	1	3	0	1	1	2	0	0	1	3	0	2	3	2		26



# PROBLEM RELATIONSHIP WITH ECOSYSTEM SERVICES

Nr.	Problem\Services group	Prod.	Regul.	Val.	Func.	Total
1.	Restricted access to sea	2	0	3	0	5
2.	Coastal erosion/dune existence	1	2	3	3	9
3.	Access of coast for people with special needs	0	1	3	0	4
4.	Coast erosion/shoreline preservation	1	3	2	3	9
5.	Over flooding during storms/areas with minimized risk of flooding	2	2	0	1	5
6.	Risks to valuable biotopes/the existence of valuable habitats	1	3	2	3	9
7.	Sea water quality	1	1	3	1	6
8.	Human safety in bathing/swimming places	0	0	3	0	3
9.	Nutrients pollution from rivers/ensuring the quality of water in rivers and on the coast	3	3	0	2	8
10.	Individual households' wastewaters/ensuring the quality of water in rivers and on the coast	3	3	0	3	9
11.	Potential pollution form industrial sites/industrial territories with (at least) no increase in the amount of pollution	0	2	1	1	4
12.	Forest damage/the existence of high-quality forest ecosystems	3	2	3	3	11
13.	Marine litter/unpolluted coastal assurance	1	3	3	1	8
14.	Risks to nature and culture capital/natural and cultural heritage of the existence of high quality	2	0	3	1	6
15.	High local seasonal pressures/providing minimally polluted coastal zone in sezonality visiting periods	2	2	3	1	8
16.	Construction of residential buildings on coast\dune existence	1	2	3	1	7
17.	Insufficiently managed low density territories	2	1	3	2	8
18.	Low environmental management/governance capacity	1	3	2	3	9
19.	Limited coastal communication/the existence of coastal communication	3	1	2	2	8
	Service group involvement	29	34	42	31	136
	The share of service group	21%	25%	31%	23%	100%



# INSTITUTIONAL MAPPING

## **Institutions involved in the coastal management/governance identified and their roles/activities established**

It was identified more than 130 institutions currently involved or having potential interest for coastal governance

- **Authorities – 56** (state level 21, regional 9, municipal 16, villages (parishes administration and elderlies) 10)
- **Public service enterprises – 3**
- **Local businesses - 13**
- **Communicators – 21** (national level 3, regional 2, Local: newspapers 2, Education establishments formal and non-formal – 11, museums 2, tourism centre 1)
- **local NGOs – 39** (cross horizontal 32, villages based 7)

personalised stakeholders established as well





## USE OF THE INDICATOR SYSTEM AS THE SES MODEL: DEVELOPMENT OF LOCAL MUNICIPAL MONITORING SYSTEM

CIS is structured firstly by main components of sustainability (nature, economics, social environment, governance, integral indicators). Each indicator included in the CIS has passed review on its disciplinary area of expertise. The following disciplinary parts are included in the CIS:

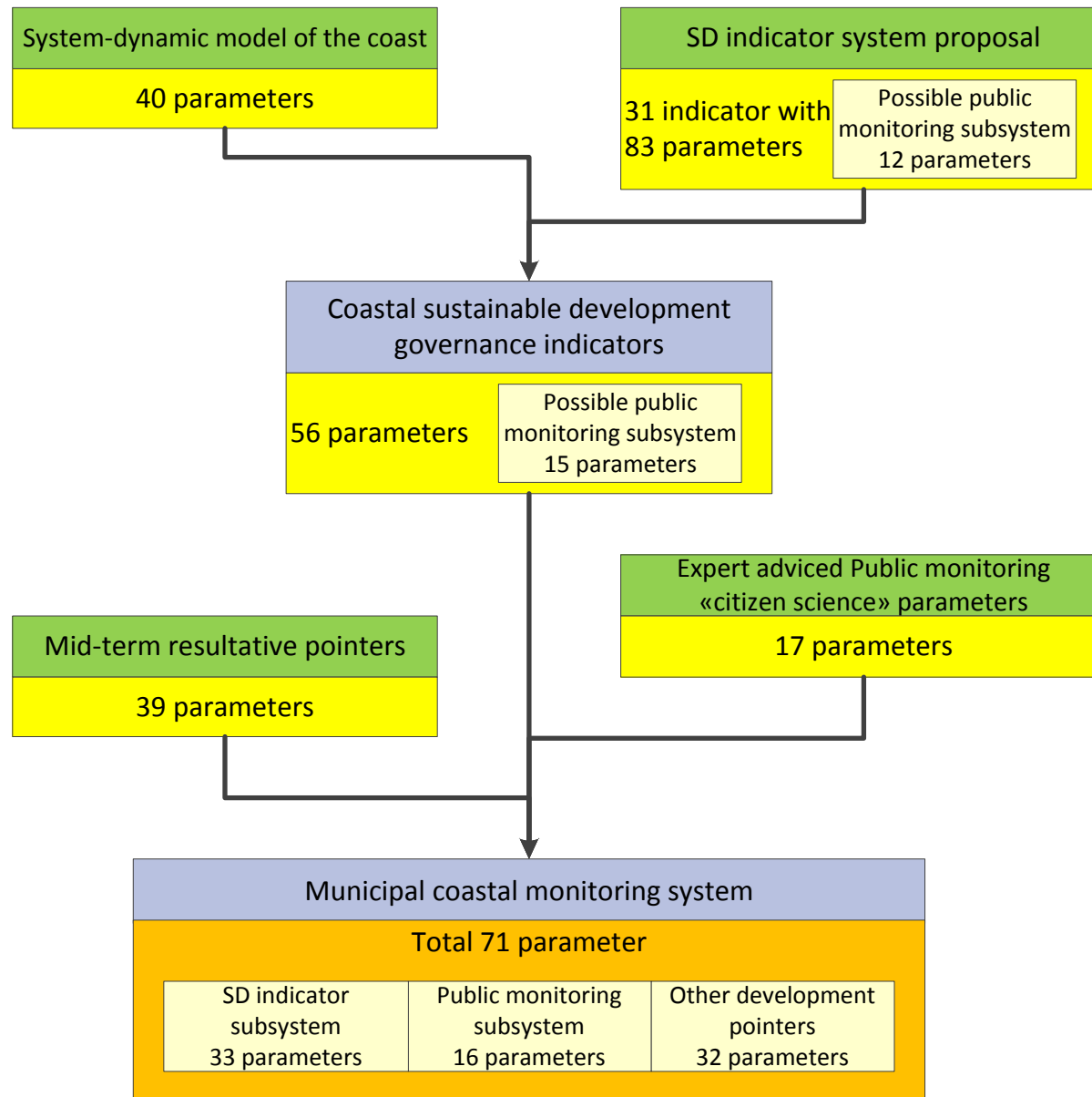
- coastal nature and environmental quality,
- coastal economics
- coastal lifestyle.

The interlinkage of different parts of CIS to reflect interdisciplinary character of coastal area has been done by introducing within the CIS the part of integral indicators.

- **Indicators**; long-term processes, maybe objectives too; quantitative
- **Resultative pointers**, the achievement of objectives; quantitative
- **Semi-quantitative parameters**: ranged observations (for example, in scale «It is not found-A little-Average-Totally»)
- **Action pointers**, checklist type («Yes/No»)



# DEVELOPMENT OF MUNICIPAL COASTAL MONITORING SYSTEM

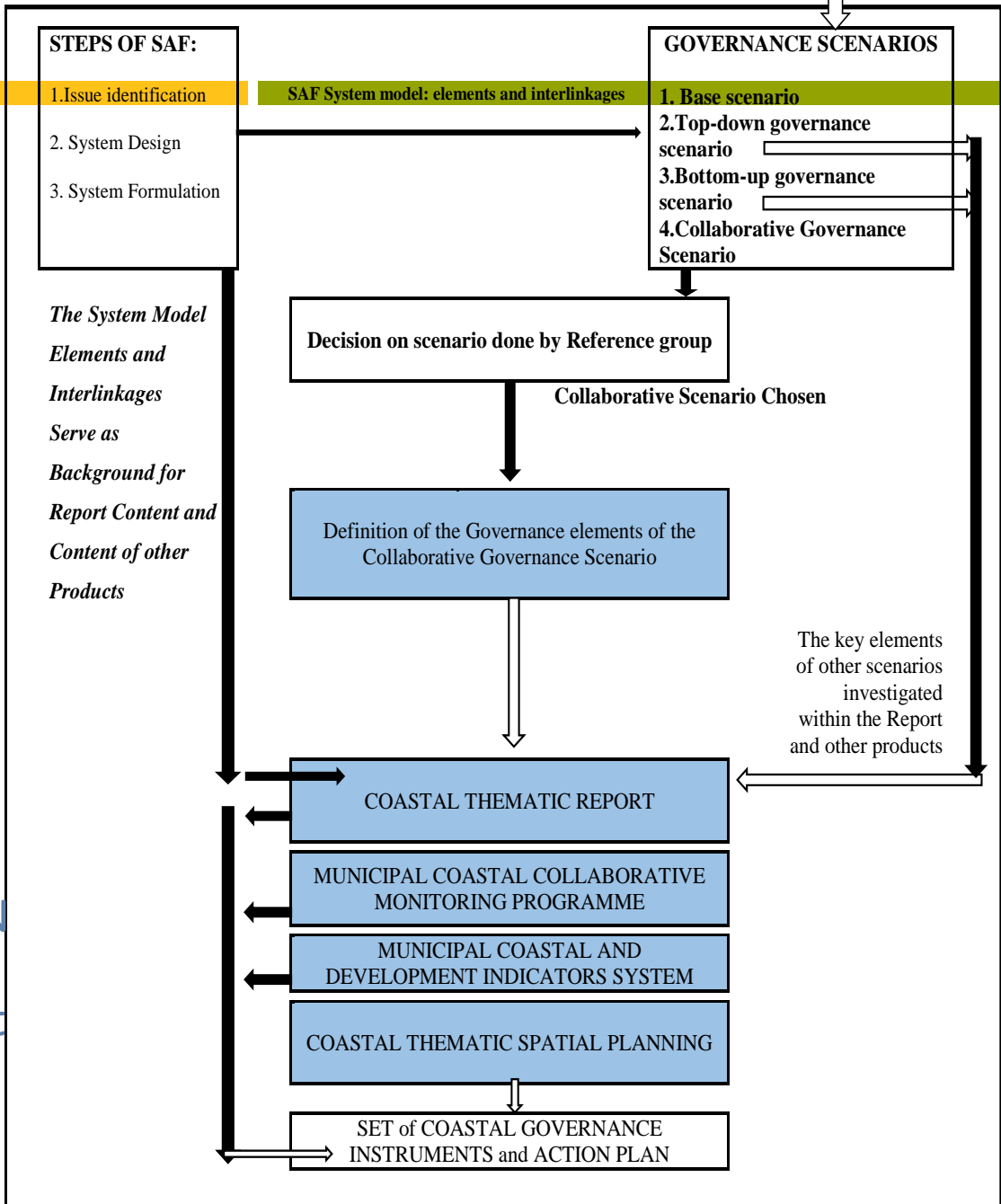






**SAF SYSTEM MODEL is the BASE**

**Coastal Governance Scenarios are incorporated**



LOCAL INNOVATIONS: complementary



# COASTAL OUTLOOK

## ➤ **Statical part and dynamical part**

Statical part - represented by the snapshot of the parameters of coastal system dynamic model (CSDM)

Dynamical part - represented by the Coastal sustainability indicators system (CIS)

## ➤ **Qualitative and quantitative part**

Quantitative part – described by the CIS

Qualitative part – illustrated by main qualitative relationships of the CSDM, as it not possible describe by the CIS



# OUTLINE OF PUBLIC MONITORING PROGRAMME (CITIZENS SCIENCE)

## **NATURE**

- Photo documentation of coastal processes
- Monitor of the state and trends of coastal dune fortifications.
- Coastal accumulation/ erosion areas
- Locations of Washed ashore algae for assessment of as Beach quality and their further management
- Distribution of invasive species in terrestrial part of the dunes.
- Monitoring of wintering aquatic birds.
- Public Monitoring Programme on Marine Litter
- Illegal motor vehicle entrance in the dune zone,
- Small river ecological quality by bioindication

## **COASTAL GOVERNANCE**

- Equipt sites
- Exit points at the sea, which are fixed in nature
- Exit points at the sea, which are suitable for disabled people
- Number of waste containers and bins
- Supported NGO driven projects number and total financing, thsd. EUR (NGOs involvement)
- Inhabitants satisfaction with the coastal governance (NGOs involvement)



# HIGHLIGHTS – ICZM INSTRUMENTS SUMMARY

## **COASTAL INFORMATION SYSTEM as pre-condition for decision making:**

### **-1- Coastal Outlook**

Municipal level Coastal SES Statuss and Governance (Thematic) Report !  
Content/Process Guidelines – to be basic Source Book/Report/data for any ICZM  
and OTHER sectors decision making/planning

### **-2- Coastal Municipal Monitoring System**

Municipal Coastal Sustainable Development Monitoring Programme:

- for regular/actual info provision and also 2-4 years Coastal Outlook update, incl.  
and to be used separately also, the following:

- Coastal Indicators System (incl. list of necessary indicators within SES frame)
- Public Coastal Monitoring Programme Outline (**Citizen science** approach)

### **-3- Integration Guidelines**

Blueprint for data/monitoring/procedures integration into mandatory municipal  
planning PROCESS AND DOCUMENTS – Municipal Development Program (for 7  
years period with annual upgrade) and also Spacial Planning/spatial plan



# HIGHLIGHTS – APPROACHES REALIZED

- System Analysis Framework (SAF) as the general frame was applied to create, based on public/stakeholders involvement/recomendations, better coastal development planning and **coastal governance processes innovations** at the local level for both:
  - **sectorial** integrated coastal governance (ICZM) **application**, and
  - **integrative application** as for sectorial ICZM to be integrated into formal development planning and process (horizontal and vertical intergation);
- Designed coastal **science-governance interface** model with particular **ICZM INSTRUMENTS** for case territory (to be transferable to all coastal municipalities in Latvia) – **all products as national inovations in Latvia**;
- e.g. SAF methodology was applied to governance PROCESS case to create local coastal municipality owned **COASTAL INFORMATION SYSTEM** as **pre-condition for decision making** – based on social-ecological system (SES, incl. also governance system/resources) modelling and later adaptation to national/local information possibilities/needs:



