Sustainable Coastal Science-Policy-Practice Interface Development: Municipal Coastal Governance Indicator System

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Abstract: - Coastal research-and-development studies conducted in Latvia do provide clear conclusions that local coastal stakeholders are neither satisfactory informed and knowlegable of their municipal coastal situations and nor aware of problemsolving developments. Looking for multi-stakeholder cross-sectoral and cross-level coastal problem complex governance solutions, first of all shall be done the integration of coastal nature science research results with those of social science research, both having mandatory/important part of citizens science local contribution also, in order to create nature-social science interaction and complementarity understanding for its eventual implementation into municipal integrated coastal management (ICM) agenda setting-planning-implementation, particularly according to the framework of national-local coastal area classification system initial necessary development. Further on for the complex municipal ICM development requested nature-social science interaction results could be transformed into local level science-policy-practice interface process and content development being based on structural design of first time local municipal coastal monitoring system in Latvia as well as complemented by municipal coastal indicator system.

Local municipal indicator system simultaneously provides input both, for the municipality ICM and the assessment and achievement of municipal strategic development goals. Assessment of indicator values is carried out by local municipality based on precisely elaborated system of algorithms, assuming active implementation of citizen science principle, external experts can be contracted initially while starting the system and only upon specific necessity later on. System is supplemented by external indicators that can be referred to local territory.

Key-Words: - integrated coastal management, coastal indicator system, municipal coastal monitoring, science-policy-practice interface, citizen science

1 Introduction

Importance of sustainable coastal governance is EU-widely recognized during the last decades. Such a governance has the integrative nature – this aspect has been already determined by repeatedly prepared EU guidelines, which require implementation of integrated coastal zone management (ICZM) at least at the national level by initial application of the disciplinary approach. Important and still open question is the development and implementation of integrated sustainable coastal governance by local authorities.

However, the practical development and realization of integrated coastal management (ICM) meets the obstacle of generic feature. General problems perceived for real ICM practice development particularly at the local municipality level and especially in Eastern Baltic region is to be seen at **both ends of governance cycle – science and policy**. There are recognized the lack of locally based coastal research knowledge and its interpretation into municipal both coastal/safety and socio-economic development planning. Namely, decision-makers and politicians at all governance levels, especially at local one, have **insufficient science-based information and understanding** of coastal specific to cope in practice with the ICM challenge. The scientific information currently available to the coastal/municipal manager about the physical state of the coastline from observations, models and scientific interpretation is often too complex and difficult to use directly. As a result, vulnerability to the impacts arising from the global changes, including climate change, are increasing and this increase of vulnerability manifests especially at the local level [1]. To cope with this, local communities' and stakeholders' awareness of the coastal situation/processes and understanding of the **coast as the complex socio-ecological system** shall be enhanced, as this is a precondition for sustainable coastal management. On the other hand,

the municipal planning and different cross-sectorial planning (coast, agglomerations, sectors, etc.) are demanding use of science based information as background for provision practical recommendations for the governance of the coast [2, 3].

The issue is to **provide interface between science and policy,** meaning preparation in an integrated manner the science knowledge that we can **translate, transfer and integrate** into ICM related decision making and implementation practice. This objective would require to elaborate necessary background and tools for both transfer process and products, in order to manage the interpretation of scientific data into language understandable for local, regional and national politicians and general public as well. To assess the coastal situation, science-based and at the same time easily applicable and interpretable **municipal coastal monitoring and coastal indicators system** should be created [4].

In this article we will demonstrate and discuss approach and principles of such system development to transfer coastal science integrated knowledge into coastal decision making to help to improve ICM decision planning and policy. This system, based on nature-social science factors and their interaction, including citizen science component, thus might become an effective instrument for the coastal governance at local level. To create this multi-folded system, the following main structural elements are needed:

(1) a kind of interface between science and policy,
(2) integration of coastal nature (physical) science research and knowledge with that of coastal social science knowledge to be acquired in parallel and complementary (e.g., flood risks shall be investigated both in nature science and social science point of view),
(3) creation of the management system to interpret the scientific data into language understandable to politicians, stakeholders and people in general,
(4) integration this knowledge into the whole municipal coastal governance cycle process/products with innovating and facilitating ICM decision making and policy renewal, complementary instruments based planning and implementation,
(5) development of coastal area classification system (physical classification including social elements) serving as a basis for science based general knowledge transfer and exchange between coastal territories/areas.

Coastal communication is seen here within two basic complementary frameworks: (1) as science-policy interface communication and also as (2) stakeholders' communication. Coastal science communication models shall be elaborated, based on nature and social science complex interaction application. It is necessary to design an integrated coastal science communication content/products and to prepare local authorities and stakeholders participated communication process with integrated governance process and governance instruments development.

All this shall result in ICZM development model for particular municipal coastal territory.

2 Principle of science-policy interface within municipal ICM

The Figure 1 demonstrates the structure and the key challenges realizing the science-policy practice interface. At **first**, the challenge is **coastal research development.** Our physical and social knowledge of land-sea boundary is known from a number of academic and applied studies, however we can still recognize the lack of locally based coastal research knowledge. Important, for local coastal municipalities, having direct coastal forcing and governing impact, there is necessary to have not only shoreline physical development characteristics, but also the knowledge of interests and behavior of **main stakeholder groups** and intermediaries, also collaboration capacity, traditions and overview of instruments available for existing ICM oriented practice.

Locally based coastal knowledge might be improved by applying combination of two approaches:

- in development and realization of new methods for research performance in the local level, which are feasible both in terms of financial, human resources and time contribution, i.e. significant investment there can provide citizen science development and cooperation between local governments and universities, finding the optimal shape of such cooperation;

- other one is to facilitate the transfer of research knowledge (as well as of best ICM practice knowledge) from one case/country to another cases/countries.

Regardless to a significant diversity, we may find quite many similarities of coastlines and coastal areas in particular regions (like south-eastern part of the Baltic Sea coast), then we do come to conclusion that we need to elaborate a locality based **coastal area classes (CAC) system**, to categorize various coastal units that can be mapped at

meaningful scales, in order to introduce classes/sub-classes of coastal physical, but not excluding also social, characteristics, as support tool for such transferability. Adaptation and socialization of existing models for SE Baltics, consideration of coastal geomorphologic properties depending upon their significance and attitudes toward ICM purposes are the biggest challenge of such approximation. We will not analyze those coastal research development aspects more detailed in this article, just indicate, that their solutions are some important research worth. It can be noted, that SE Baltics coastal peculiarities manifest in a way that majority of coastal sections are formed of unconsolidated quaternary sediments, main sediment input to the coastal system is provided by coastal erosion, and in addition also longshore sediment drift is widespread, linking waste portions of coast in to subsystem elements. Complex research data, being obtained in the decided academic research areas will justify the relatively simplified measurements, to be used for municipal monitoring needs.

Most important socio-natural processes and impacts parameters based scheme is the backbone of to be designed and applied **municipal coastal monitoring system** as **second** challenge, finding a key coastal indicators and improvement of ICM models and scenarios.

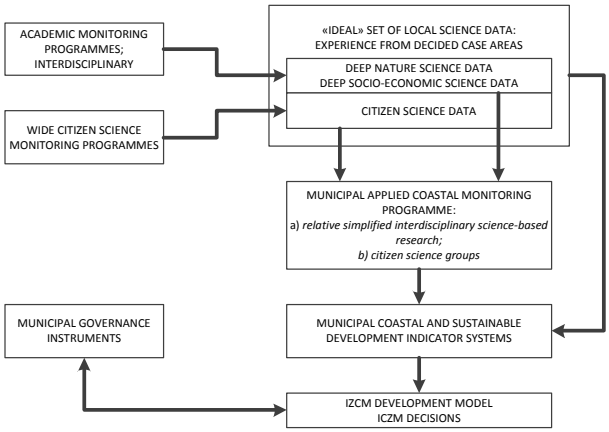

Fig.1. Principle of science-policy interface

The introduction of municipal coastal monitoring program, based on various types of applied measurements done by local employees and stakeholders/citizens groups, and being suitable for unambiguously interpretation of coastal state & conditions are those real instrument considered by authors that could be applied by coastal municipalities and used in practice for coastal policy development and implementation thus having municipal practice based way of ensuring the interface between coastal science and policy. Municipal monitoring program offers specifically minimal-optimal research amount, quantitatively describing the state of a coastal system. Important, the municipal applied monitoring should include both nature and socio-economic monitoring and particular programs of municipal monitoring should be adapted for different CAC.

Thirdly, the helpful and innovative tool might be **Coastal Governance Thematic Report**. Even called Governance Report, it considers the coast as the socio ecological system - not only governance report, but all parts of nature, economic and socio data by discussing them in the governance perspective. Such Reports fulfill the following requirements, which are important for science-policy interface:

- Report considers the coast as the socio ecological system;
- Report are science data based and contains a wide quantitative information;
- Report are easily understandable (if in proper language written) for local stakeholders/decision makers;
- Report come from values and reflect the values.

The Coastal Governance Thematic Report together with the Municipal Public Coastal Monitoring Programme is substantial coastal governance innovation in Latvian conditions. It:

- provides data for municipal coastal and development governance needs which municipality cannot obtain by themselves due to restricted resources;
- strengthens cooperation between citizens groups themselves, between citizens groups and municipality, and creates faithfulness;
- by demonstrating weak points and negative trends motivates to change the situation;
- is appropriate tool for starting a coastal governance improvements due to improvements might be started of different scale.

The **fourth** challenge is creation and application of **municipal coastal (and development) indicators system.** Indicators are a tool of information organizing, priorities determination. The contemporary complex and not satisfactory studied situation do require both sophisticated analysis and also applied municipal practice related solutions to those many overlapping and interrelated issues in the coastal areas. This is to be done by organization of physical and socio-economical as well as governance parameters, and their mutual integration, qualitatively and quantitatively

characterizing the subject into a coherent multilevel approach [5].

Indicator system must be designed under subsequent principles: (1) system and indicators shall be based on research results or reliable data sources, (2) spatial system must identify coastal zone with necessary resolution for municipal as well as national planning needs, allow to separate littoral zone from the reference area and to compare segments of littoral zone with each other, (3) system must be in accordance with criteria for application of information provided - important for reliability and comparison of results and usable in long-term scale, (4) system must be able to provide recommendations to be used for monitoring and evaluation of coastal sustainability at different governance levels, including municipal level [6].

Indicator systems development and adaptation for local ICM include two component parts: using results of complex research in specially decided (pilot) coastal areas and implementation of relatively simplified research in other coastal areas. Thus, the indicators system has two inputs: the first one – data from the municipal coastal monitoring program, the second one – data from the decided territories, which are transferred based on the similarities/CAC between them. The using of transferred data, where applicable, will help to avoid need for sophisticated analysis in particular municipality (see Figure 2).

There can be developed generic indicators system model which might be adapted for particular CAC. Application of the CAC, depending on the physical characteristics (and eventually also some socio ones as well) of littoral zone, provides the possibility to supplement obtained indicators in the pilot territories with local level indicators obtained by applying the comparatively simple methodology of their determination. The CAC concept is therefore innovative concept in relation to ICM practice, providing possibility to determine mutually comparable and relatively homogeneous coastal territories/areas.

This generic model of indicator system might be used as the draft model before sociological research in the particular area to understand what kind of questions and in what way to include them in sociology. When constructing indicator system, the principles of horizontal and vertical integration shall be taken into account (more deep discussed in next chapter).

The importance and suitability of indicators approach for science and policy integration is determined by an interface of principal factors:

(1) numerical value of each individual indicator, its determination, it is based on the solid methodological science, and at the same time;
(2) indicators group selection, which is used in decision-making reasoning, is based on values recognized by target groups/stakeholders, which with their selected decision makers functioning are reflected in definite ICM policies.

Coastal awareness rising, growing collaboration of municipal stakeholder groups, understanding of common societal and territorial development challenges and opportunities, and its implications towards collaborative decision making, are those **basic cornerstones for sustainable coastal development**, which undoubtedly will disclose in the selection of indicator system. Indisputably, indicator system includes certain indicators, whose value is to determine the involvement of experts. But at the same time an important component of indicator system are indicator values defined by citizen science, namely, stakeholders group desire to actively participate, by using scientific methodology, in the operation of indicator system, in combination with both above mentioned factors.

Problem issue is that the particular nature-socio economic system oriented indicators and their systems have been designed and applied so far mainly on national level, consequently this level is responsible for and carries out the assessment of values included into indicator system. A logical, national level indicator systems in their goals cannot so detailed uncover local community values. At the same time sustainable development of local coastal territories calls for concerted taking into account national and local value and development interests, formulating coastal governance policy. Also, there are various indicators and their systems of coastal evolution trends, but many are not suitable for local municipal level due to (1) sophisticated evaluation methods and expertise needed or (2) not enough specific for land-sea interaction. Namely, the indicator system models are often based upon functional analysis of system to be researched, or the problem analysis of the territory, but were not always linked with the practice governance of the coastal territory/area. Why haven't the local municipalities been offered such indicator system before? One of the possible answers is that the higher quality is obtained from indicator assessment on national level since it has been accomplished by the leading experts and governmental institutions and it is difficult to arrange such expertise on the local level due to the limited research and financial

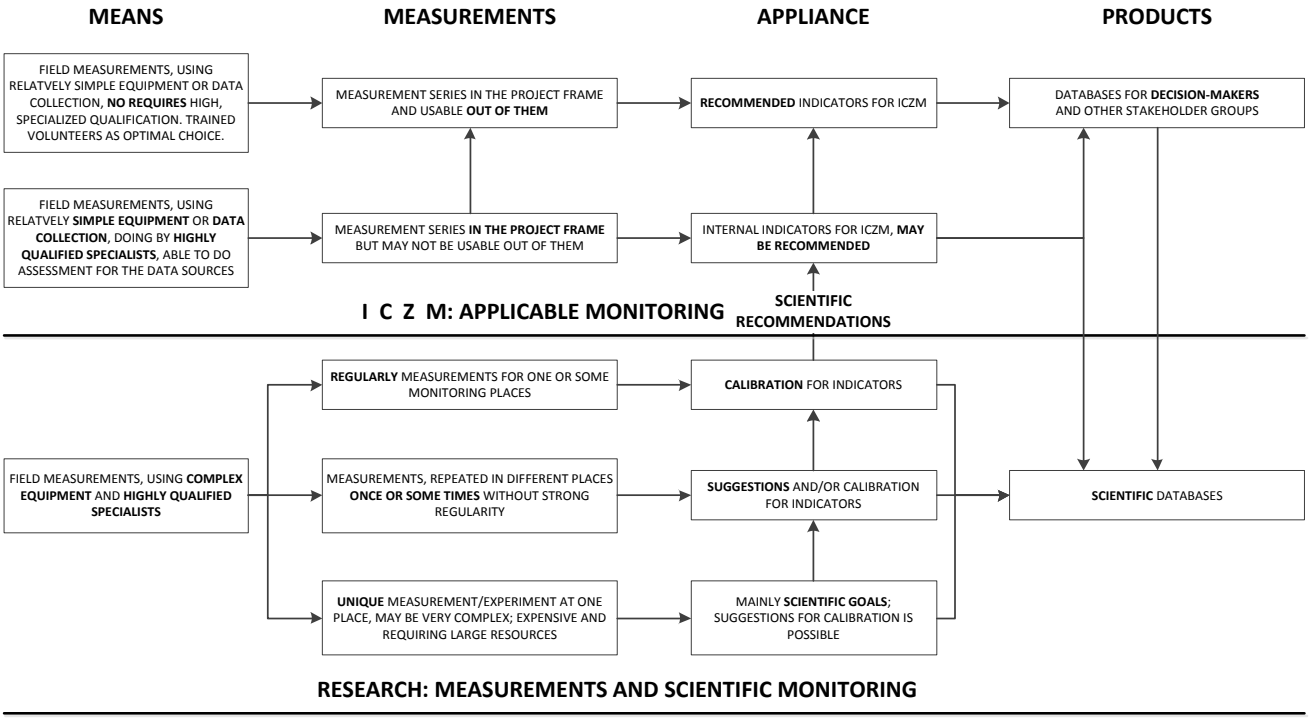

Fig.2. The methodological cross-linking for research, monitoring and indicators

resources. Our suggestion solving this problem by offering innovative approach for at the same time unambitious, and substantial natural science data, based and citizen science involved local/municipal indicators system creating and implementation.

Municipal coastal policy is implemented applying already existing **governance instruments**, at the same time particular ICM decision, made based on values, indicated by the indicators system, might need development and/or implementation of new governance instruments as well. Implementation of coastal governance/IC planning and management shall use all **main municipal governance instrument groups** (both in disciplinary and integrated way), such as political, administrative, legal (including ownership), planning, infrastructure, economic, communication (as coastal information, education & training, advisory measures, involvement/participation of target groups and their environmentally friendly behavior). It is necessary to specify the following problem aspects regarding the use of coastal governance instruments: (1) not all of these municipal governance instrument groups are actively or widely used even in municipal governance as a whole, (2) at the same time the situation is characterized in that not all of them are identified and adequately assessed exactly in the view of coastal governance, (3) in local practice still is not developed enough necessary **complementary tool application** to realize ICM, (4) particularly insufficiently is assessed the place of communication instruments and the role of communication products. The necessary municipal guidelines, recommendations and handbooks based on best practices shall be elaborated and widely communicated for both implementation of coastal governance in general and application of sustainable coastal development governance indicator system in particular.

Realizing the sustainable coastal governance, all **the stages of the governance cycle** should be considered as equally important and adequately assessed starting from:

(1) Problem analysis (cross-sectorial audit of governance area by sustainability dimensions), followed by;
(2) Policy development/construction (statement of main principles, and key planning elements such as vision, goals, priorities as integrative problem areas), and
(3) Planning & Programming (activity directions and main task/action groups), finalizing by
(4) Management ("real time" action planning, implementation supervision) and
(5) Monitoring.

Certainly, each of these stages includes interface between science knowledge and policy practice. The necessity to improve sustainable coastal governance requires to innovatively address, analyze, design, test up and implement new governance models particularly at local municipal

level, but not only, what is to be done in the general context and particular application of the sustainable development paradigm for coastal areas, emphasizing system approach and integration principle necessity for complementary development of the disciplinary and integrative ICM approaches.

3 Model for governance indicator system: process and content

A selected set of indicators is part of the data flow that can be used for qualitative decisions and well-planned activities making. Indicators are principal component of ICM at all stages of governance cycle: from the beginning of initial assessment until supervision of planning documents. However, in many cases the consideration of indicators system is linked only with the final 3rd -5th stage of the governance cycle (programming and monitoring). In our approach, the indicators development should be started from the beginning of governance cycle, namely, situation assessment and problems identification (stage one). Thus, the process of using indicators and an indicator set in all stages is directly connected to strategic development planning generally and ICM particularly.

Municipal monitoring of coastal state shall be defined around a possible minimum set of parameters that can quantitatively describe the state of a coastal system, including all sustainability dimensions: indicators are linked within natural, social, economic and governance/communication dimensions of sustainability and within particular problems of ICM at the given locality (as indicated by practices, the state of coastal communication unfortunately in many cases is missing when describing the coastal state).

For indicators describing natural environment-specific processes, research is the theoretical basis, justifying appliance of indicators, used regularly and at numerous areas. Complex research data, being obtained in the pilot areas will justify the relatively simplified measurements, to be used for municipal monitoring needs. For example, coastal profile measurements, transfer of materials and others, measured in pilot areas, could be linked with some simple measurements without complex equipment and highly qualified staff in other coastal areas. Prepared general indicators systems shall be adapted to particular main classes of coastal classification and elaborated in full detail for the pilot case sites. As a result, system in general and particular indicators are based on both local research results and reliable data sources from academic research; here comes the role of CAC approach. Practical recommendations shall be prepared for CAC's based municipal coastal governance in the relation to coastal science results transfer.

Developing indicator system, is necessary to analyze and assess such indicator system creating aspects as: (i) types of indicator classified in relation to the coastal zone, (ii) indicator system internal integrativity, (iii) indicator system horizontal integrativity, (iv) integration with national and regional systems (system vertical integrativity), (v) requirements for indicator informative background.

Indicator relation to the coastal zone can be characterized by 4 types: (1) **special coastal indicator** reflects directly and exclusively the structures characteristic to coastal zone, (2) **general coastal indicator** does not reflect any special coastal feature, but it is possible to correctly numerically distinguish within it the data referring to the coastal zone as it is defined for actual scale and spatial type, (3) **indicator applicable to the coastal zone** meaning that on the actual system scale, direct or indirect coastal impact can exist, but it cannot be correctly separable neither spatially nor numerically, however, qualitative or semi-quantitative assessment of coastal impact is possible, and, finally (4) **indicator has no coastal specifics** meaning that coastal influence, if any, is not separable in the scale of given system; however it can be determined in comparison with inland and/or other, similar coastal areas.

Given the integrated principles of planning, the indicator system must be integrated, too. **Integration must be horizontal and vertical**. Under horizontal integration we mean balanced inclusion of indicators in a frame, comprised by sustainability dimensions (nature, social, economic and governance & communication dimensions) at local level and indicators shall be linked within particular problems of ICM at the given locality and shall provide linkage of ICM with the strategic development of the given local municipality. Thus, this is where the **idea about common development planning could be directly perceived.**

Related to integrativity of indicator (see Figure 3) the three types can be distinguished: (1) **sectorial (sub-sectorial) indicator** refers mainly to the state of one sustainability dimension, relation to other blocks is remote, (2) **integrative indicator** characterizes several blocks (one of them could be dominant) and their intermediary links, such as integrative problem areas, (3) **integral indicator** reflects the studied area as one entirety [7].

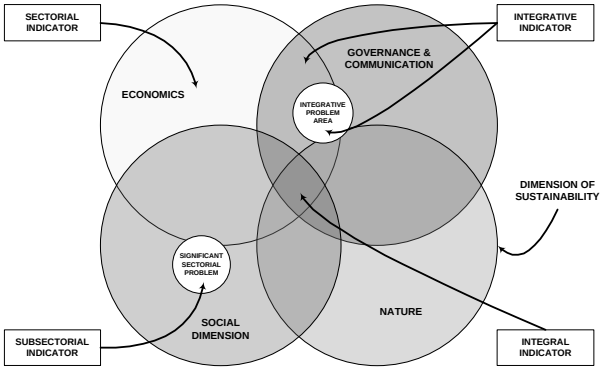

Fig.3. The principle of indicator system internal integrativity.

Horizontal integration of indicator system requires linking with other the same level indicator systems (with other municipalities for municipal case) and between different planning documents inside one planning subject. For example, at municipal case it could be local development long-term strategy and mid-term program, municipal sectorial planning documents etc.

Vertical integration of indicator system requires linking of indicator system with municipal, national or international level indicator system, including existing sustainability assessment systems at EU range of coastal zones and in general as well. Integration with national and regional systems of indicators is provided by the following: (1) indicators from highest planning levels must be included for comparison of success of development at all planning levels (vertical axis), (2) local indicators must illustrate common and different for all municipalities and their general groups, defined at national planning documents (horizontal axis). In addition, indicator system shall provide sectorial vertical integration by contributing into assessments needed for the fulfillment of the functions of the regional institutes of state responsible for coastal zone management such as regional environmental boards.

The requirements for indicators are well established during the last decade. The general requirements may be divided in three groups: scientific, functional and pragmatic requirements. The **scientific requirements** for the indicator include the following ones: measurable and quantifiable (adequately reflect the phenomenon intended to measure), meaningful for the user, clear in value, clear in content and used units, appropriate in scale, no redundancy or double counting (indicators are not overlapping in what they measure), robust and reproducible, sensitive and specific (indicators must be sensitive to changes in the system under study, and ideally respond relatively quickly and noticeably), verifiable, hierarchical (to allow a user to understand the level of detail necessary) [8]. The **functional requirements** include the following ones: relevant for all stakeholders involved, compelling (interesting, exciting and suggestive of effective action), leading (so that they can provide information to act on), possible to influence (indicators must measure parameters that are possible to change), comparable (if the same indicators are used in several systems, they should be comparable), comprehensive (indicator set should sufficiently describe all essential aspects of the system under study) [9]. **Pragmatic requirements** include the following ones: manageable (not too many to handle), possible to understand by stakeholders, feasible (measurable at reasonable effort and cost), timely (compellable without long delays), coverage of the different aspects of sustainability, allowing international comparison [10]. Apparently, the functional and pragmatic requirements relate to the policy part of the science – policy interface.

We paid special attention to establish requirements for the coastal indicators informative background and concluded on the following: (i) data must be as linear sequence or matrix of numeric values, (ii) the coverage and resolution in time and space must be defined, (iii) data for any point at time and space in the defined coverages must be comparable, (iv) data for all defined space and time must be accessible on acceptable conditions, (v) data must be reliable enough, (vi) indicator must be interpreted unequivocally, (vii) for stakeholder groups indicator must be illustrated by graphical tools (maps, charts etc.) [11]. Spatially system must identify coastal zone with necessary resolution for municipal and national planning needs, and to separate littoral zone from comparison area (including hinterland) and to compare segments of littoral zone with each other.

Elaboration of an indicator system embodies one of the most effective forms of public participation because of: (i) indicators offer new information for the public, (ii) elaboration of indicators, data gathering and calculation involves somebody possessing important information. It has to be noted that indicator initiative processes are not less significant than the result – the elaborated indicators.

In order to manage to inquire and acquire not only physical parameters of shoreline, but also the real picture at the social part of shoreline and that of the whole local coastal municipality there is

necessary to approach both **main stakeholder groups:** 1-municipal council (politicians, managers/ planners, subordinated); 2-households/inhabitants, 3- corporative (business) sector, and to be in close collaboration with 4 – state administrative institutions, and all intermediaries as mediators (media, NGO, educators, experts/science).

4 Science-policy interface the mediator tool

Sustainable coastal governance development shall be perceived and managed within both short and also long interests of all coastal stakeholders and successful communication process shall be oriented towards really wide and selective stakeholders' collaboration within whole research and ICM development process. In order to be successful when facilitating stakeholder attitude and behavior change it shall be started with comprehension and understanding of coastal processes from both nature and man-based impacts and their inter-linkage with interests of all local and other level stakeholders. Elaborated municipal monitoring and indicators systems shall be necessarily communicated and also this way tested within whole coastal science-policy interface communication process and products.

Interest should be devoted to communication frame and instrumentality to use coastal science communication complementary and in collaborative manner with the whole set of main ICM instruments. The facilitating process instruments shall be developed and tested, based on all main collaboration communication complementary components: **coastal information and formal/non-formal education/training, participation and coastal behavior change**.

The proposed science-policy interface might serve also as the effective mediator tool to serve predictable problems related to ICM implementation. Among these problems we would like to address the following ones:

- possible contradictions of municipal development planning interests with restrictions stated by national coastal and protected areas legislation. Science-policy interface and indicators system (indicators values manifesting problems and challenges) might be used as communication tool between municipal and state administration to define particular areas of municipal territory to be developed or to be preserved/conserved;
- the antagonism of opinions from different stakeholders – „developers" and „nature friends". This would refer to ICM decision making, but indicator system will offer adequate, scientifically proved information which might be used for exploration of different coastal development scenarios and recommendations;
- risk for increased focus on coastal areas, forgetting about hinterland and the need for comparison. There will be indicator systems of coastal strips**,** definitely within the rest of municipality context, through all four noted above sustainable development dimensions;
- the lack of unbiased information about processes (including physical, biological, social and economic) in coastal areas – spatial sporadicity of high precision measurements or on the other hand, insufficient spatial resolution. Therefore, would be useful for each of CAC, adequately elaborated / adaptable and optimal in practice municipal/ public monitoring plan, that could be realized without or only minimal annual participation of scientists/experts and simultaneously with active citizen science involvement;
- insufficient understanding about ICM on municipal level. ICM has to be shown/presented in municipality through well-known noted above six governance instrument groups, in addition, coastal communication should be planned including focus on **communication times 4 of its instruments.**

5 Developing science-policy interface practice in Latvia

As the pilot the Sustainable coastal development governance indicator system has been developed for Saulkrasti municipality, accepted by Saulkrasti local authority as a part of supervision for municipal long-term strategy and mid-term program.

The system contains a 65 indicators, including: (i) 19 environmental indicators, divided in 7 thematic groups, (ii) 20 economic indicators, divided in 6 thematic groups, (iii) 15 social indicators, divided in 5 thematic groups, (iv) 8 governance indicators, divided in 3 thematic groups, (v) 3 integral indicators. Most of indicators are integrated at least for 2 dimensions of sustainability. In this pilot system 21 of indicators directly or indirectly describe the coastal impacts and processes [12].

CONCLUSIONS

By this it is offered the comparatively innovative approach for science-policy-practice

interface within municipal ICM based on local municipal coastal monitoring and coastal indicators systems and on substantiated data/information of natural sciences as well of social sciences and having important part of citizen science too.

Municipal indicators system is important part of this interface. Integration of social research results with those of nature research shall be done in order creating of nature-social science interface understanding and its implementation into municipal and ICM planning, particularly according to the steps of design of coastal area classification system and municipal applied monitoring system application.

Three principal conditions simultaneously are to be fulfilled within local/municipal indicator system:

(1) indicator system is designed for accomplishment of ICM within the local coastal municipality and simultaneously provides input both, for municipality ICM and the assessment and achievement of municipal strategic development goals;
(2) assessment of indicator values is carried out by local municipality based on precisely elaborated system of algorithms, assuming active implementation of citizen science principle in indicator's values assessment, external experts can be contracted upon necessity;
(3) system is supplemented by external indicators that can be referred to local territory and which are obtained from coastal pilot (deep academic research) territories and reveals characteristic processes to the coastal region.

The capability of the local municipality regarding the assessment of ICM indicators within its own territory results in: (1) increase of local reliability on the obtained assessment result and crucial problem points based on this assessment (2) the local authority/government, in particular, is the initiator for the discussion about coastal values and their development in local municipality, that is, these values are not introduced from outside; (3) seeing the interrelationship of ICM with the development of the whole municipality, the local government appears to be much more motivated in accomplishment of ICM, furthermore carrying out it with general public and main target groups.

As far as possible, the necessary socio economic research within the particular coastal area/municipality shall be designed and done jointly with national research programs/international research projects, but allowing space for national and local coastal area specifications and traditions.

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