# HOUSEHOLD PRO-ENVIRONMENTAL BEHAVIOR DEVELOPMENTS: LOCAL PRACTICE LIMITATIONS AND PERSPECTIVES IN MUNICIPALITIES

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**Abstract**
After an initial national-level representative household survey was conducted to study pro-environmental behaviour (PEB) developments in Latvia, a directly related representative local household survey was performed in two chosen township municipalities. The survey was combined with deep semi-structured interviews of selected households and selected experts/specialists aiming to study backgrounds of existing PEB practices in local municipal socio-ecological systems. Survey scope included not only the basic environmental thematic sectors, but, also non-traditionally, sustainable consumption clusters-based sectors, as well as, considering the governance stakeholders PEB situation and governance instruments applications (Triple Governance Dimensions model frame). The study complementary included also PEB related territorial observation studies, analysis of municipal data, statutory and voluntary documents as for Case Study Research methodology application. The Research-and-Development framework approach was used and pre-planned research collaboration started not only with both municipalities, but also with local Eco-schools as introducing the Socially Engaged Research frame too, involving school students into the research process. Similar to the national survey, most of households consider themselves as at least PEB-oriented, although it does not always translate into PEB practice – known value-action gap was seen as caused by various barriers, actually, recognizing a set of barriers and their direct correspondence to the whole list of PEB governance instrument's groups - regulatory, institutional, planning, economic, infrastructure, and communication barriers limiting PEB instruments. Upgrade and systemic development of PEB governance instruments are required, and especially, in partnership with mediators the complementary development of communication instruments - information, education/training, involvement/participation, and practical PEB demonstration use.
**Keywords:** governance dimensions, sectors, instruments, stakeholders, communication, socially engaged research.

## Introduction

Promoting sustainable consumption in society is the basis of the sustainable development concept and is one of the long-term development priorities of the European Union. Accordingly, the long-term National Sustainable Development Strategy in Latvia also provides for the practice of a sustainable lifestyle in society. Housing is the first provision for human life. Individual can take initial responsibility for reducing environmental management practice problems by maintaining their home in an environmentally friendly way practicing a pro-environmental behavior (hereinafter – PEB) and lifestyle.

A grand prerequisite towards achieving sustainable development goals is the practice of PEB by all types of organizations - institutions, interest groups, communities and individuals in everyday life. The main consumption sectors that have the greatest impact on the environment, assessed both by the ecological footprint and the amount of greenhouse gas emissions generated by households, are food, housing, and transport. The loads created by other sectors, such as communication, education, and financial services, are much smaller.

To promote PEB, it is necessary to achieve a balance between economic growth, social development and environmental conservation, as well as to achieve the development of the attitude and behavior of the population in the context of sustainability on a global, national and local scale, as well as in households, respectively in household environmental management (hereinafter – HEM), as the hitherto under-estimated and purposefully updated, truly the lowest and closest level of environmental management to the population (Stern, 2000; Ernsteins, et al. 2011).

Efforts to define a sustainable lifestyle are a complex process, as they include different understandings of each individual and the entire society as a whole about what is the environment and the actions and behavior that are friendly to it. The definition proposed by the UN Commission on Sustainable Development states that a sustainable lifestyle is a pattern of consumption and behavior that satisfies basic human needs; ensures a better quality of life; reduces the use of natural resources; emissions of waste and other pollutants throughout the product's life cycle and does not threaten the needs of future generations. In turn, the Latvian Sustainable Development Strategy for 2030 defines it as a healthy and environmentally friendly lifestyle, which includes: a careful attitude towards the environment and nature, remembering the needs of future generations; thoughtful decisions and reasonable actions, creating the best possible life for oneself and children. The concept of PEB is closely related to the concept of environmentally significant behavior found in the literature, the validity of which can be defined by the impacts on the environment created because of a specific behavior (Stern, 2000). Paul Stern classifies the manifestations of PEB into two groups: 1) actions that are oriented towards intentions (actions that the person acting considers to be environmentally friendly); 2) actions that are oriented towards impacts.

PEB and lifestyle are a set of important factors and actions that strengthen the concept of a resilient community and promote sustainable development. The sectors of separate waste collection, energy, transport and food are those in which PEB has been popularized to the greatest extent in Latvia so far. In general, it must be said that an environmentally

friendly lifestyle has not become widely popular although individual PEB actions have taken root, which have most often been related to financial or accessible infrastructure aspects. Ensuring the development and practical application of environmental communication (Ernsteins, et al. 2017a), in general and specifically HEM, in all its complementary instruments, is essential to promote individual awareness (Ernsteins, et al. 2017b).

The aim of this paper is to account and system-based assess PEB activities and its background settings in Latvia's households based on the results of national and local sociological surveys, and complementary case study research methods, paying special attention to the two key approaches.

Initially, a three-part set of factors that explain the most important factors determining our behavior: individual (skills, values, knowledge), social (social and legal norms), material (infrastructure, technologies, products and delivery systems) (Blake, 1999; Entwistle et al., 2015).

Also, another three-part set of complementary governance dimensions approach being seen as potential PEB governance dimensions framework (Ernsteins, et al., 2017b) - PEB sectorial thematic content, related to each interest group's role and behavior, as well as, PEB barriers overcoming governance instruments.

***1. Frameworks for environmentally friendly actions***

In the context of the environmental management process, PEB can be defined as actions motivated by the environmental awareness of society and the individual, which are manifested in professional and everyday activities and whose goal is the identification and resolution of environmental problems (Ernsteins, 1999). They are manifested as individual and collective actions aimed at the conservation and development of natural capital: reducing resource depletion and pollution, increasing ecological capacity and preserving and developing ecosystem services.

According to the motivation for action, PEB can be divided into unconscious, impact-reduction-motivated and intention-motivated actions, which do not necessarily provide significant environmental benefits. The proportion of motivated (conscious) and unmotivated (unconscious) actions in the PEB of an individual and a community indicates the sustainable behavior of an individual or a community.

The practice of PEB in everyday life is influenced by a number of factors. These are environmental values, which are based on personal orientations towards the environment. Namely, people with a greater set of eco-centric values tend to be proactive in reducing environmental pressures. At a basic level, the availability of environmentally friendly goods and services (infrastructure) is crucial. Social factors largely help us to differentiate people according to their level of PEB, and relate not only to people's demographic profile, but also to structural features (e.g., waste sorting capabilities) and situational factors (e.g., knowledge of environmental problems and opportunities to solve them) (Steg & Vlek, 2009). Theories explaining behavior vary, but in this case, we will use both above mentioned three-part sets of:

- factors as un individual, social and material context approach that determines our behavioral habits;
-governance dimensions as structured into communication contexts and socio-ecological systems governance context approach, that necessarily emphasize PEB encouragement and step-wise establishment, as well as governance framework.

***1.1. Individual context***

Individual factors can include, for example, personal values, attitudes and skills, as well as rational considerations that a person makes before acting, including the assessment of personal benefits and costs. However, recent research has shown that making choices is largely based not on pragmatic calculation, but on basic heuristics, generalizing from accumulated experience and emotional events.

How people feel about something – their emotional response – is another aspect of their behavioral choices (e.g., fear, kindness, or apathy). Some theories contrast spontaneous, emotion-based decisions with pragmatic, rational choices. This distinction is often related to a person's self-control and self-confidence in their ability to complete a behavior. A person needs skills to know to perform an action, including knowledge of a procedure (e.g., the skills of driving a vehicle in an energy-efficient manner) (Shove et al., 2012). Habit is a behavior that is performed automatically and frequently, usually at the same time and place. It can also be understood as a routine. The range of factors influencing behavior shows that human behavior is not always conscious and rationally balanced.

***1.2. Social context***

Opinion leaders can be considered people who have a strong influence on others, for example, in the formation of social norms. In social networks, these people can be nodes in a network that connects many. Also, institutions influence the behavior of groups of individuals when they participate in specific activities or interact with other people. Institutions can be formal (such as the normative framework established by the government) or more informal (such as family life). In both cases, there is a specific behavior that is expected of participants. People's perceptions of how other people evaluate their behaviour have a strong influence on the decisions they make. People in society play different roles (mother, employee, football fan, etc.), which determine a person's different patterns of behavior and attitudes. A related concept is identity, which is a person's 'inner' sense of who they are (e.g., being a good person or identifying as 'green'). The web of relationships between people, characterized by mutual acquaintance, trust, and interaction (sometimes called 'social capital'). Social networks can help explain how ideas, innovations, and behaviors spread (e.g., growing your own food).

***1.3. Complementary communication context***

Various research done in recent years are characterising both the sector-based behavioural aspects or more engagement-based practices, but all together coming to some emerging patterns or another PEB development contexts, particularly, stressing communication process, content and instruments (Ernsteins, et al., 2017a) towards carefully studied and selected stakeholder sub-groups and well-planned governance frameworks (Brizga & Ernsteins, 2016).

The model of action-oriented collaboration communication (Ernsteins, 1999; Ernsteins et al., 2017a) emphasizes that the full-scale communication process is realized as a result of the sequential and mutually complementary use of the four dimensions or instrument groups – information, education-training, involvement-participation and PEB development and demonstration, subsequently step-wise with usage of each next instrument, are acquiring knowledge, experience, understanding, skills, attitude, motivation and, most importantly, not only readiness for specific action, but also the practice of self-experience of each specific thematic action. Further ok leading to the formation of a specific thematic environmental awareness and, in the context of repeated cycles, a gradually integrative environmental awareness is possible (Ernsteins, 1999). Accordingly, the PEB is viewed as a motivated action of society in general, various interest groups and stakeholders, and everyone in their professional and everyday life activities.

Research indicates that individuals with high self-efficacy, civic engagement, and those in rural areas are more likely to engage in environmental co-production - compatibility between local services and citizen needs also plays a crucial role (Alonso et al., 2019). A study on household recycling practices found that reputational concerns, as avoiding shame, significantly influenced PEB. This highlights the role of social esteem in driving environmental actions (Alpizar & Gsottbauer, 2015). Researchers found also a positive relationship between personal values (egoistic, altruistic, biospheric) and pro-environmental attitudes, which influence waste sorting and sustainable consumption, stressing the importance of fostering responsible consumption (Majumder et al., 2023). Personal and social norms, and perceived behavioural control are major factors influencing waste separation behaviour (Goh et al., 2022). The environmental knowledge and values were found to positively correlate with efficient household water consumption (Sarpong et al., 2022).

There could be recognized certain emerging patterns arising from scholars made studies, just to mention some key characteristics:

- Information and education: effective communication and education are crucial complementary communication instruments for overcoming barriers to PEB and motivating sustainable practices (Ernsteins, 1999; Sarpong et al., 2022). Empowering individuals through training and resources enhances their ability to adopt sustainable behaviours (Majumder et al., 2023; Alpizar & Gsottbauer, 2015).
- Participation and PEB actions/demonstrations: suggesting interventions as possibly collaborative should aim for socially rewarding PEB actions as own participation and publicly available PEB practices can motivate pro-environmental behaviour (Majumder et al., 2023; Esfandiar et al., 2021; Brizga & Ernsteins, 2016; Alpizar & Gsottbauer, 2015).
- Policy and public support: inclusive and collaborative policy frameworks are essential for successful environmental governance, considering demographic engagement towards collaboration (Alonso et al., 2019; Alpizar & Gsottbauer, 2015).

***1.4. Socio-ecological system governance context***

The development of the household environmental management (HEM) focuses on two basic aspects: improving the living environment inside the dwelling and enhancing cooperation with other households in the outside/public environment. This includes promoting and influencing the availability of external conditions for environmentally friendly management of the dwelling. The work does not analyze the consumption approach separately, but by looking at the most important consumption clusters, namely housing, food and mobility, an integrated approach is developed to include info HEM all three clusters. When formulating the content structure of HEM, it is necessary to supplement it with a description of the development of HEM processes, namely, HEM includes the entire environmental management cycle from situation assessment and environmental policy development to action planning for practical implementation and later monitoring in the management of housing and its internal and external environment.

***Clusters and sectors of the HEM dimension.***

The division of HEM sectors according to the European Topic Centre on Sustainable Consumption and Production (ETC SCP) is three consumption clusters: housing and building; food and drinks cluster and mobility/transportation cluster. However, such an approach in the context of HEM does not fully cover all elements of the HEM functioning as socio-ecological system (SES); therefore, we offer a modified SES-based three-cluster model for HEM: natural, engineering and built environment as infrastructure cluster; social, cultural and economic environment as lifestyle cluster; separately also management and communication environment as stewardship cluster (Ernsteins et al., 2011).

Subsequently, the following list of thematic sectors needs to be built to be considered for adequate HEM sector-wise implementation. The **HEM Infrastructure cluster** may include 5 sectors: Nature environment (including external environment with land resources); Built environment; Energy; Water and Waste. **The HEM Lifestyle cluster** would consist of

also 5 sectors: Environmental health; Food consumption; Consumption of household products, objects and services; Leisure activity/recreation (including culture environment) and Inhabitants mobility. Finally, the HEM **Stewardship cluster** includes just 2 main sectors: Management sector (including 6 groups of main instruments) and Communication sector (including 4 groups of instruments – environmental information and education, public participation and PEB) (Ernsteins et al., 2011). Those two last sub-sectors of Stewardship cluster are integrative and **horizontally-oriented sectors** compare to **vertically-oriented sectors** for Infrastructure and Lifestyle clusters.

Moreover, besides this governance content basic specifications as governance content dimension there is to be added also governance stakeholders' dimension and governance instruments dimension to be altogether realized as complementary dimensions (who, what and how is realizing governance process). This **Triple-Dimensions Governance framing model (TDG)** potentially are to be seen as PEB governance framework (Table 2).

**Materials and Methods**

To assess the household's environmental management (HEM) and their related PEB, the National research grant-based project study used both quantitative and qualitative sociological research methods and there were two research stages – national level overall PEB study in Latvia and municipal level study in two chosen township municipalities.

***National household's PEB survey: realization.***

Initially, the national household PEB survey questionnaire was developed (R. Ernsteins, J. Brizga, J. Kaulins) and implemented (number of respondents sufficiency: n = 1009; confidence interval: 3%) in the frame of the national research grant project SUSTINNO (2015-2019). The survey, using stratified random multistage sampling and face-to-face interviews in the places of residence of respondents overall in Latvia, was conducted by the permanent national network of interviewers as for this data gathering there was commissioned sociological consultancy company TNS (Latvia). Realization of the questioner filling-based interview requested from interviewer and respondents 45 – 60 minutes. Results of this survey are published (Brizga et al., 2017)

***Municipal household's PEB survey: introduction.***

Following, the next project stage was realized: in-depth studies of household PEB practice at the local municipal level in Latvia, and chosen two township municipalities - Liepaja and Valmiera (Table 1).

Both municipalities are statutory orienting their development planning documents and implementation process towards Green Municipality perspective (Valmiera have the voluntary Environmental Declaration (2015) approved by the City Council) and are municipal environmental governance forerunners in Latvia. During previous years both municipalities have developed both top-down and also bottom-up based various municipal administration and main local stakeholders PEB oriented activities.

**Table 1**

*Characteristics of both pilot areas*

| ***Indicators*** | ***Liepaja*** | ***Valmiera*** |
|---|---|---|
| Number of residents | 67 398 | 22 811 |
| Area ($km^2$) | 68.02 | 19.36 |
| Population/people per $km^2$ | 1 313 | 1 221 |
| Households, thousand | 32.6 | 9.9 |
| Average household/persons | 2.04 | 2.26 |

Source: (Central Statistical Bureau, Latvia, 2025).

They are having different basic statistics (Table 1) and located in different ethnographic and planning regions of Latvia, also having comparatively different development histories previously, even both being also actively supporting industrial developments. Liepaja (about 75,000 inhabitants) as costal town at the Baltic Sea is located in Kurzeme region, western part of Latvia. Valmiera (about 25,000 inhabitants) is spreading at both coasts of Gauja river, located in Vidzeme region, north-east part of Latvia. Both cities can be characterised comparatively similar – regional, industrial and transportation hubs, green, recreation, sport, education and culture centres.

The study in both municipalities was aiming to assess background settings of existing municipal PEB practice situation and existing/required pre-conditions, households' motivation, limitations barriers, existing and to be developed whole set of governance instruments and, particularly, communication instruments (Ernsteins et all., 2017a) (Table 2).

***Research-and-development (R&D) framework.***

R&D was functioning towards also enhancement of PEB policies and its implementation qualities locally as project was realized in close partnership in regular communication and various seminars, knowledge exchange with both municipalities, as well as, in research partnership with local Ecoschools as for students' research involvement.

***Case study research (CSR) methodology.***

CSR was implemented complementary combining various sociological research methods. Initially, municipal and other data, along with statutory and voluntary municipal planning, regulations and other related documents, were studied. This was combined with related territorial and process observation studies un relation to PEB practice by various stakeholders.

To evaluate the data obtained in the national questionnaire and further on to test and adapt national questionnaire to the particular municipal level, before the local survey began, 10 in-depth semi-structured household interviews were conducted Valmiera and 14 in-depth interviews were conducted in Liepaja. The interview averaged up to 1 hour, as the interviews had the same questionnaire as the national (and later also

local) survey. Interviews were oriented to go into the detail of reasoning behind households PEB contexts, decisions and behaviors in all environmental infrastructure - lifestyle - stewardship clusters, also stakeholders' participation and their PEB, barriers recognized and instruments used, altogether as of Tripple Governance Dimensions model (Ernsteins et all., 2017b) as PEB governance framework (Table 2).

Also, after conducted surveys in both municipalities, an in-depth semi-structured interviews based on survey's thematic blocs and environmental governance dimensions was realized (up to 1 hour in length) with two groups of specialists – with three environmental issues related specialists in Valmiera municipal administration and four similar specialists in Liepaja administration, as well as, with three academic experts with extended research and practice collaboration experience in municipal environmental governance and PEB.

***Socially Engaged Research (SER).***

The studies in both municipalities were conducted with extended element of SER. The results of these local in-depth interviews as well as results of the national questionnaire were presented and discussed in focus group interviews with main stakeholders invited in both municipalities of Liepaja and Valmiera. Later, survey results and focus group results were presented to representatives of local governments at the Liepaja City Council's Environmental Commission and at a roundtable discussion with municipal specialists and experts in Valmiera municipality (no existent municipal Environmental Commission etc. alike).

All results and local recommendations from the discussions were used to adapt the national questionnaire for local municipalities. While the same structure and questions were kept, some recommended local specifics were added, particularly questions about residents' satisfaction with the environmental services provided by their municipalities.

SER approach application, involved establishing a partnership not only with municipal administration and its specialists, but also full-scale research cycle involvement of local Eco-schools (Green Flag schools). The planning and management process of the survey implementation in both townships included several necessary collaboration steps with participating schools. These steps were: introducing results of the national survey and main concepts and models behind the studies, presentation and discussion of the local survey questionnaire, training students and teachers, supervising the survey process, gathering results, evaluating and discussing findings. Volunteering students were assigned to particular districts of the city and as prescribed were visiting households there and conducting questionnaire-based interviews. Finally, students made practical recommendations for municipal administration.

***Municipal household's PEB survey: realization.***

To assess in-depth HEM and PEB, a local household survey was conducted with necessary representation: in Valmiera with n = 373; in Liepaja with n = 361; and confidence intervals - 5%. Table 1 represents the main quantitative characteristics of both pilot territories. The survey in municipalities was practically conducted by Eco-school students, primarily from secondary schools, being supervised by teachers/Eco-schools coordinators. The processing of the questionnaire data done by company TNS was financially supported by both municipalities.

The structure of the questionnaire was based on designed 3 thematical PEB management clusters described above and consisted of 5 thematical parts, including more than 40 questions (Brizga et al., 2017):

1. general SES-based characteristics of the household,
2. household environmental pressures - assessing all traditional environmental sectors one-by-one in detail (infrastructure cluster),
3. household consumption pressures - assessment of all goods and services used, mobility (lifestyle cluster),
4. household environmental values, participation and overall management (stewardship cluster),
5. household PEBs and their motivations.

The research covered the entire municipal environmental governance process, including evaluations of all the process cycle stages from situation analysis, policy design, planning, till implementation management and monitoring (Ernsteins et all, 2017b) and, covering three governance dimensions – governance sectors, stakeholders and instruments (Table 2).

**Table 2**

*Case study research frame: three governance dimensions*

| ***Sectors** (extended)* | ***Target groups*** |
|---|---|
| Nature/biodiversity | State/National government |
| Land resources | Municipal government |
| Water resources | Entrepreneurs/bussines |
| Energy | Society/households |
| Air protection | Media |
| Waste | NGOs |
| Building/housing | Educators (non/formal) |
| Transport/mobility | Science/Academia |
| Food & drinks | **Instruments** |
| Other products/resources | Political and regulatory |
| Recreation/culture | Institutional/admin |
| Environmental health | Planning |
| Household stewardship | Financial/economic |
| Communication sector | Infrastructure/technologies |
| Climate change | Communication |

Source: (Ernsteins et all., 2017b).

**Results and Discussion**

***Municipal case study research***

This paper mainly reflects and analyses the results of local municipal level surveys, Limited number of interviews and municipal data and document analysis, but the national survey data is used only for comparison and could be followed separately as partially published (Brizga et al., 2017).

***1. Environmental sector problems around the house***

Respondents in the cities of Valmiera and Liepaja are recognizing various environmental problems in traditional urban environment thematic sectors (Figure 1). Dust was most frequently mentioned as a permanent or frequent environmental problem near their home by both respondents in Valmiera (29%) and Liepaja (49%). The second most frequently mentioned environmental problem is noise, which was mentioned by 37.3% of respondents in Liepaja and 28% in Valmiera. Polluted natural waters were mentioned the least (6.8% in Liepaja, 4.3% in Valmiera).

Respondents in both cities are mostly satisfied with the quality of many environmental and other services available at and near their homes - the proportion of very satisfied and satisfied respondents is in the range of over 50% to 80%. At the same time, it should be emphasized that the lowest satisfaction applies to very important sectors – preschool educational institutions and children's playgrounds. Although the differences in the overall satisfaction of respondents (very satisfied + satisfied) are small in both cities, the number of respondents who answered very satisfied is lower in Liepaja city.

**Figure 1**

*Environmental problems near the home that respondents mentioned as constant or frequent (%)*

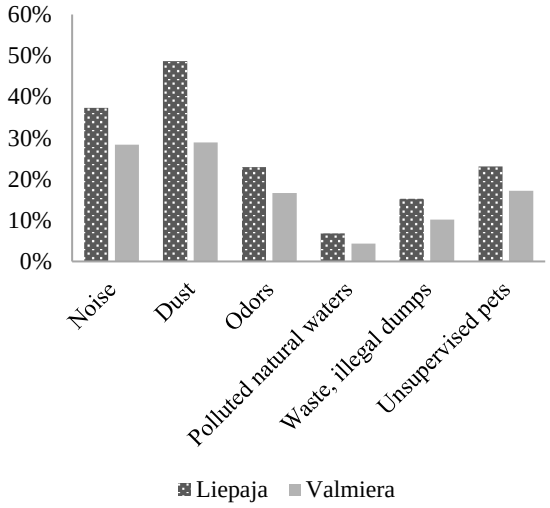
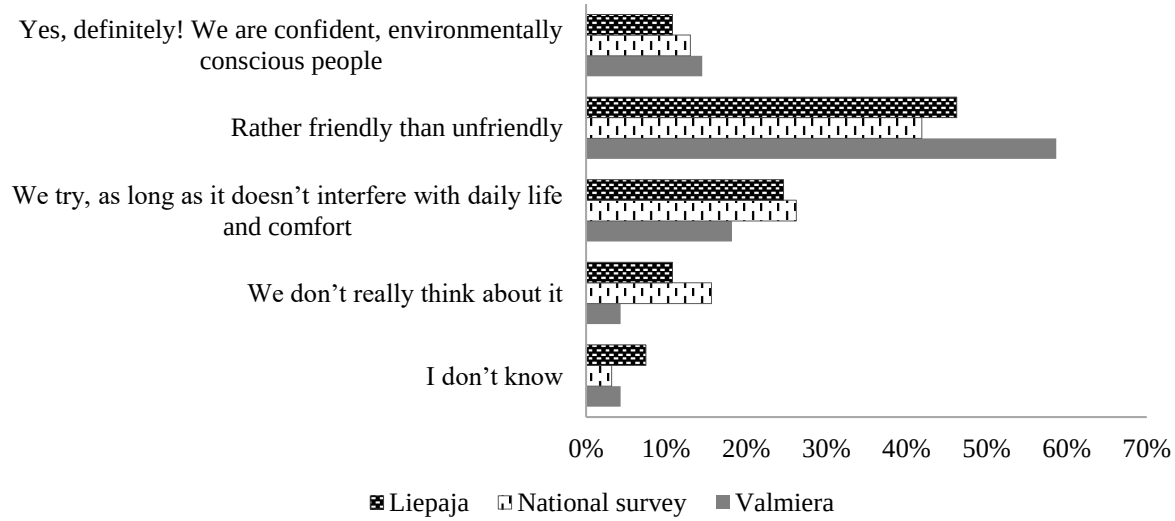



**Figure 2**

*Overall, how would you rate whether your household is environmentally friendly?*




50% of respondents in Valmiera and 35% in Liepaja consider the environmental quality of their home surroundings to be good or very good. However, there are also relatively many people in Liepaja (11%) who consider the environmental quality of their home surroundings to be poor.

***2. Integrative assessment – PEB in general***

The national survey shows that environmental protection is very (40%) or quite important (49%). Only 2.9% of respondents consider it not very important, and 0.5% - not at all important. Similar, but even much higher positive scores are also found in Valmiera and Liepaja: in Valmiera, 89% of respondents, but in Liepaja, 82%, believe that environmental protection is very or quite important to them (Figure 2).

Most respondents consider themselves to be committed to being green, or rather, environmentally

friendly. 13% of respondents in the national survey consider themselves to be convinced green-minded. The residents of Valmiera (15%) consider themselves to be more 'green' (Figure 2) as in Liepaja (11%).

To the question 'Which of these areas do you think the municipality should improve so that residents can live a 'greener' lifestyle?' respondents from both Valmiera (51%) and Liepaja (53%) most often answered that by providing better infrastructure. The ability to monitor how we consume resources more and stimulate change was mentioned much more by the residents of Valmiera (46%) than by the residents of Liepaja (25%). By way of example, the municipality implementing sustainable consumption, supporting those who want/do it, was mentioned by almost half of the respondents in Liepaja (49%), but only a fifth in Valmiera (21%). The public transport planning and communication, informing residents was similarly rated by respondents in both cities.

From the interviews taken there was affirmed quite radical PEB change to more environmentally friendly household behavior after a child is born in the family or in cases of changing a number or type of inhabitants of particular household. Three of the respondents interviewed had children who were a few months old. The birth of a child in these families has increased consumption, both in terms of the child's clothing, furniture, belongings (toys, diapers, etc.) and food purchases, as well as mobility and health care. However, on the other hand, families with newborns are starting to pay more attention to the use of environmentally friendly detergents and a healthier, more environmentally friendly diet etc.

So, changes in consumption habits usually occur when people's living conditions change, e.g. several respondents pointed to the following relationships:

• the widow claimed that she started buying fewer, but better-quality goods; goods in smaller packages;

• the young family, in turn, pointed out that the need for transportation, health care and food consumption habits have also changed.

Interviewees who pay increased attention to chemicals in household admit that they sometimes encounter resistance and disinterest in their families, which hinders their PEB, because people do not want to conflict with their loved ones.

Often, several generations live in one household, with different environmental awareness and environmental values. These differences also hinder the implementation of PEB. It is interesting to mention several examples regarding the use of cleaning products, which were indicated by the respondents:

(1) one of the respondents resided with her in-laws. Although she is concerned about the impact of household chemicals on the environment and their children's health, since living together she has started using environmentally friendly cleaning products less often, because her in-laws do not trust them and do not consider it necessary;

(2) one of the respondents, answering the question about the use of natural cleaning products (lemon juice, vinegar, soda, etc.), indicated that it is stagnant and a tradition of the socialist era, when people did not have access to modern cleaning products;

(3) there are also respondents who without any problems admit that they use vinegar or soda to clean surfaces. People also indicate that they choose environmentally friendly cleaning products and organic food in cases having allergies in the family.

**3. *PEB awareness: most to least popular behaviours***

Local surveys also show which actions people in the PEB are already implementing and which they would not be willing to take (Figure 3). One of the most popular actions is the use of cloth shopping bags (62% in Valmiera, 63% in Liepaja). Respondents claim that they already sort waste (63% of respondents in Valmiera, 31% in Liepaja), eat organic food (37% in Valmiera, 39% in Liepaja), live in insulated housing (35% in Valmiera, 24% in Liepaja) and use public transport (34% in Valmiera, 36% in Liepaja).

However, there are also actions that people would not be willing to take. A large proportion of people (41% in Valmiera, 46% in Liepaja) would not be willing to reduce the consumption of animal-derived food products, reduce indoor air temperature (39% in Valmiera, 52% in Liepaja), cooperate with neighbours, friends, share household electrical appliances, cars, etc. (38% in Valmiera, 47% in Liepaja) and use electrical appliances less (29% in Valmiera and 38% in Liepaja). The use of an energy-efficient car is also unpopular in the PEB (in Valmiera, only 7%, in Liepaja, 8% of respondents would be willing to do so). Many of these actions appear on both lists, namely people who would never be ready to give up meat in their diet, but would gladly reduce the amount of waste, and vice versa (Figure 3). Some respondents emphasise that they would never be ready to reduce the indoor air temperature or give up their car but would consume organically grown food daily. In the in-depth interviews, people also indicate that there are things that they simply cannot change, for example, the heating system or the energy resources used if they live in an apartment building connected to the city's centralized heating. At the same time, the study revealed a significant problem: people are reluctant to be more actively involved in environmental protection, to invite others to act for PEB, or to actively educate themselves about environmental issues.

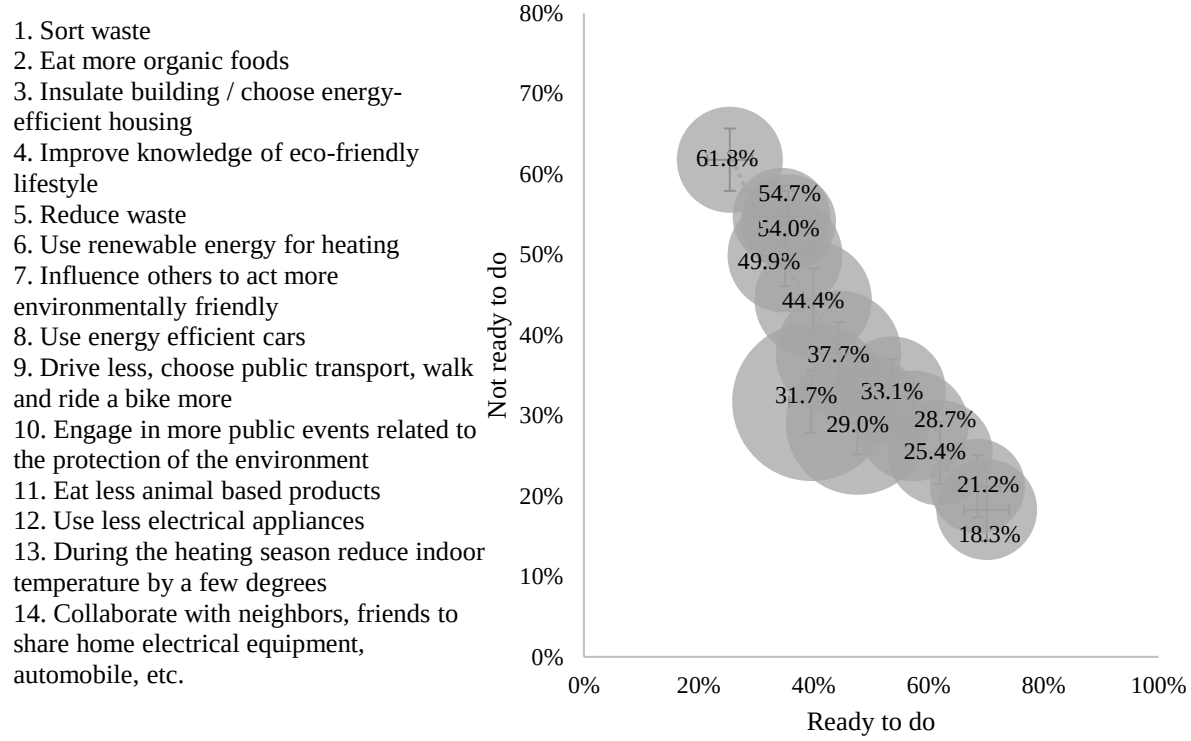
As the main reasons that slow down and reduce people's desire to act environmentally friendly in their everyday lives, respondents usually mention indifference and laziness (66% in Valmiera; 63% in Liepaja), unwillingness to reduce the existing level of comfort/sacrifice personal comfort (43% in Valmiera; 44% in Liepaja), an unsatisfactory level of personal well-being (28% in Valmiera; 27% in Liepaja), as well as ignorance. As the most frequent reasons that contribute to people's desire to act environmentally

friendly in everyday life, the respondents mentioned the values prevailing in the family and caring for their child. The values prevailing in society, the example of other people and a satisfactory level of personal well-being were also often mentioned.

However, respondents assess that the bad example and information about environmental problems do not appeal to them. At the same time, only 54% of respondents in Valmiera and 40% in Liepaja believe that they have full or partial access to information about environmental problems and their solutions. A significant proportion of respondents also mention ignorance and lack of information (36% in Valmiera; 38% in Liepaja).

**Figure 3**

*Towards Environmental Awareness: most to least popular behaviours*




### *4. Barriers to PEB developing and governance instruments for interventions*

Results of survey and interviews with households and environmental experts and specialists suggest that PEB is undergoing an evolving and uneven process across different lifestyle domains and economic sectors. Even although a wide spectrum and diversity of types of PEB is already practised, most respondents acknowledged the existence of numerous obstacles hindering the fuller integration of such behaviours into everyday life. As with PEB itself, these barriers are varied in nature. Some necessitate behavioural change not only at the household level but also within private and public organisations, including municipalities, national agencies, and non-governmental organisations (NGOs). Nevertheless, both individual and institutional actors are engaged in positive initiatives, ranging from internal organisational PEB reforms to public-facing environmental activities.

In Liepaja, a principal impediment to PEB progress is perceived to be the limited cooperation between various target groups, even municipality has developed Environmental protection and public participation unit, expanding communication activities to all groups and also having long term support mechanisms for NGO's. Comparatively, in Valmiera, the main challenge lies in the fact that, although the existing municipal institutional framework, even without Environmental unit, functions quite effectively, actually supported by the high environmental awareness of a number of senior specialists, but existing system possibly has reached its developmental limit. The establishment of a formal environmental governance structure within the municipality is now next stage necessity as mentioned especially in interviews.

A notable constraining factor is the detachment of national/regional institutions from local environmental policy. **The notion that exactly traditional financial constraints present a major obstacle is seldom** expressed in Valmiera. To some extent, the state of PEB is shaped less by the degree of formal institutional organisation and more by the **general level of environmental awareness within society and the intensity of communication between groups**. While financial resources are not the primary determinant of PEB adoption, significant infrastructure requirements and the need for additional human resources underscore their relevance. The creation of a coherent

organisational structure and coordination mechanism for environmental governance should therefore be regarded as a priority.

Barriers to PEB implementation identified in survey and particularly discussed during the interviews in both municipalities can be described as well overlapping by general-type of activities, however, obviously, having specifics due to biogeographical, economic and also some social and culture-historical differences. All in all, barriers recognized could be grouped into **six barrier's categories,** what actually is directly aligned with the same number and type of **six environmental/governance instrument's groups**, subsequently, the most relevant for addressing them and to be integrated into municipal statutory planning documents. Here is represented a short summary of most mentioned typical barriers and to be taken into account by municipalities first of all.

**1. Regulatory barriers**. National level possess two types of regulatory constraints as were identified. Firstly, certain statutory limitations, particularly affecting state/regional agencies, resulting into reduced capacity and instrumentation to address environmentally harmful practices effectively. Also, excessively rigid regulatory frameworks or their over strong application. Municipal regulations basically cover most of environmental and, directly, PEB needs, but implementation with supervising/controlling capacities are still limited and barely covered by communication means.

**2. Institutional barriers**. Within municipalities, institutional constraints are most often linked to limited capacity, resulting in an inability to prevent or penalise environmentally damaging behaviours such as littering, graffiti, and other offences. Enforcement mechanisms to maintain environmental cleanliness are underutilised; those who already act responsibly continue to do so, whereas offenders not always are affected either by administrations and/or by limited awareness campaigns, for example, the absence of a dedicated environmental education coordinator.

**3. Financial and economic barriers**. Funding shortages affect both the recruitment of necessary personnel and the maintenance and expansion of infrastructure. Residents often lack the means to renovate internal utility systems or improve energy efficiency, particularly in multi-apartment buildings. Funding constraints limit the ability to support all proposed community clean-up projects. As a result, events that should be held regularly often occur only sporadically, especially in waste management and environmental cleanliness initiatives and dome, even popular, recreation areas may suffer from under-management.

**4. Infrastructure-related barriers**. These are often linked to financial and economic constraints but can also occur independently. Waste sorting was a recurring theme, frequently discussed in contradictory terms. Some argued that sorting was being introduced too rapidly, outpacing both infrastructure development and public awareness. Others contended that low levels of participation were due to insufficient sorting infrastructure. Additional issues include the absence of a municipal composting facility for organic waste.

**5. Planning process and documents-related barriers**. Municipalities themselves or regularly encouraged by national/regional authorities traditionally are oriented first of all towards environmentally non-friendly processes and activities, but PEB type activities, even well-known, are lacking behind – not well discussed and planned during municipal planning processes of statutory documents (traditionally once in seven years of development planning cycle) as competing also with prioritized social and economic work directions. Subsequently, the statutory documents as main 7 years municipal Development Program have very limited number of PEB activities being integrated, besides general environmental infrastructure activities as being mandatory for municipalities – being so seen even for pro-environmentally oriented municipalities. This directly leads to the interconnected municipal budgeting. Outside project-based funding becomes the main PEB developments resource.

**6. Communication barriers – complementary informational, education, participation and PEB design/demonstration barriers**. Incorrect waste sorting was often attributed to insufficient or unclear information, lack of training activities and practical demonstration cases. These primarily relate to inadequate information exchange between stakeholders, notably between waste management providers and households. Municipal overall engagement with both the media and the public is improved especially in social media, but positive developments receive not adequate coverage, leaving little room for positive, educational, or instructive stories. Environmental topics are also irregularly featured and are often lost amid other content. Lack of environmental NGO's, even some other sector NGO's do perform also some environmental activities. The most persistent obstacles are behavioural, rooted in established habits and reluctance to compromise personal comfort. Attitudes towards environmental cleanliness and waste sorting vary by neighbourhood, often correlating with education levels and the prevalence of harmful habits. Deliberate damage to public infrastructure were reported more in disadvantaged areas.

As mentioned above, both national and local questionnaires show that most respondents consider themselves to be more or less environmentally friendly. However, this high environmental awareness does not always translate into PEB and a number of barriers do exist as well as governance instruments to overcome them.

Most respondents consume animal products in their daily lives, as this is common practice, and often travel by private car, as it is more convenient to get to the desired place, while often the public transport is used

by those who cannot afford private transport. But the most common PEBs do not always ensure sufficient reduction of environmental loads. People's actions are embedded in existing social norms and infrastructure - survey show that people are generally satisfied with the quality of these centralized services. For example, supply systems and infrastructure (traffic, food and heat supply) largely determine people's behavioral habits. In Liepaja, where public transport is more developed, more people use it; in Valmiera, more people live in insulated apartment buildings and sort waste, because the Vidzeme region has a much more developed waste sorting etc. waste infrastructure as regional municipalities were establishing a joint municipal company (ZAAO, located un Valmiera) for waste management, performing also waste communication function for different groups of inhabitants, what altogether strengthens waste sorting in daily practices and social norms.

Waste-related actions are also some of the most popular PEBs mentioned by respondents, such as using shopping bags and sorting waste. There is a belief that such small PEBs can lead to environmentally friendly behavior on a large scale, but there is a lack of evidence for this. Studies (Austin et al., 2011) have shown that there is no correlation between whether people undertake one PEB or several. Although PEB helps people feel more environmentally friendly, research shows that the idea of being green in relation to a specific, often relatively simple action can give individuals a sense of having done their bit for society and thus justify other non-PEB actions.

One of the biggest challenges is to find the most optimal way to promote positive changes in the daily behavior of individuals and households, making it more environmentally friendly and sustainable. Influencing behavior is a key task of public policy.

In recent decades, factors influencing behavior have been widely analysed and decision-makers should take this research into account, because changing behavioral habits can be a good tool to promote, for example, such important PEBs as waste sorting, use of public transport or a vegetarian diet. Policies aimed at behavioral changes can also be financially effective.

One of the main tasks of most policies is to achieve behavioral changes. To do this, several strategies can be used. The most common governance instruments are regulations that can set different norms of behavior. This approach is often effective, but it is very expensive and may be inappropriate in many situations. Therefore, decision-makers are increasingly using other, less regulatory, but often very effective methods. For example, those that incentivize the choice of certain behavioral habits (e.g., excise tax on fuel) or inform (e.g., public health guidelines), as well as sophisticated communication techniques.

However, it should be noted that existing instruments, such as economic and information, are not always effective, because they are based on the assumption of rationality of decision-making - if carrots and sticks are provided, together with clear information, people will weigh the costs and benefits of their actions and act rationally. Unfortunately, research shows that human behavior is not always perfectly rational, and knowledge does not always lead to action.

Our study shows that respondents do not consider environmental information to be a significant incentive for environmentally friendly behavior (Figure 4). Other studies (Oullier & Sauneron, 2011) also confirm that the statement informed people make the right choices does not hold true in practice. A large amount of information can sometimes even reduce people's ability to make the desired choice (Ölander & Thøgersen, 2014). However, it is information campaigns that are often used to promote behavioral change. Information campaigns can be significantly improved if the latest findings about human behavior are considered:

• Previous experience, emotional associations (e.g., a strong desire to avoid losses), habits and routines have a very strong influence on behavior, especially that which is repeated semi-automatically in everyday life.

• The amount of information and the relative importance assigned to it are important in deciding. However, the effectiveness of information depends on how, when and by whom this information is presented. So, it's necessary to combine the content and process of information, actually communication.

• People are strongly influenced by the actions of those around them (Figure 4), but people act in ways that make them feel better about themselves.

• People often go with the flow and stick to familiar choices anchoring to cope with the complexity of choices (Oullier & Sauneron, 2011).

• People discount the future – they place greater value on the immediate future and do not consider future costs or savings,

• People are attracted to new and seeming appropriate.

• Complexity can lead to avoidance of decision-making and sticking to current practices.

Therefore, an approach that focuses on changing the context – the environment in which we make decisions and respond to cues – has the potential to produce significant changes in behavior at a relatively low cost. Designing policies closer to our innate responses to the world offers a potentially powerful way to improve individual well-being and social well-being. Therefore, it is important not only to inform people about PEB, but also to show good examples, encourage and educate, involve and create various incentive mechanisms and eliminate the most harmful actions with the help of rules and restrictions.

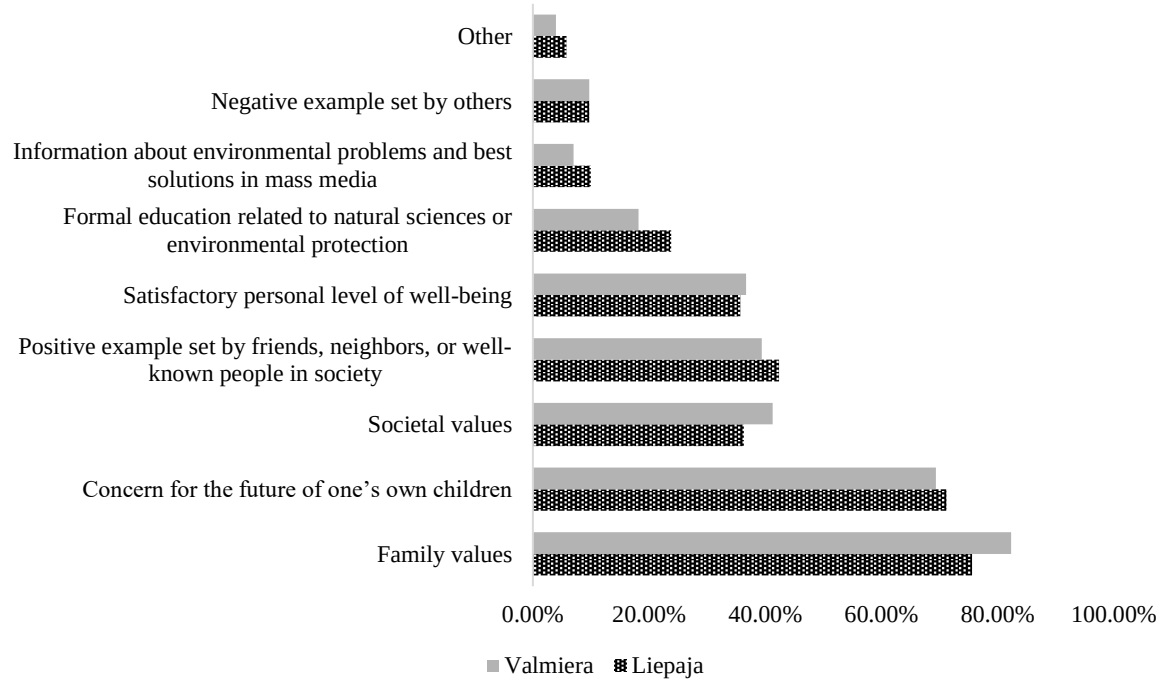
Research shows that behavior based on routines and cultural habits (e.g., high meat consumption, transportation habits, or waste management habits) can be associated with various biases and selective perception: people select information that confirms their preferences and ignore information that does not

match their habits (Steg & Vlek, 2009; Gifford, 2011). This is a significant challenge in the development of PEB. Although many respondents say that in the future, they would be willing to reduce their consumption, use private cars less, or learn more about sustainable lifestyles, there is no certainty that people will be able to break out of their usual routine and translate their good intentions into action.

The study also reveals that the desire to protect or improve the environment is rarely the primary motivation for people's PEB but can reinforce it. Several PEBs appear to be motivated by the desire to save money, improve health, clean up the environment, increase property value or gain recognition from others. However, the costs of PEBs are also relevant issue in Latvian society, since the income of most of the population could be a limiting factor as well.

**Figure 4**

*What, in your opinion, encourages people for PEB in their daily lives? (3 possible answers)*




There is also the free-rider problem – the behavior of those members of society who benefit from the environmental protection actions of others but are not prepared to pay for it themselves. This can lead to ignoring unpleasant environmental considerations.

Since an individual's behavioral habits depend on both the individual himself and collective practices, norms, technologies and infrastructure, etc., PEB management must take place at both the individual and community levels. Efforts to change behavior should not only focus on the psychological and functional needs of a person but should also consider the social and symbolic value of a modern lifestyle.

The physical environment can play a significant role here, for example, infrastructure and supply systems that form social norms can play a decisive role in the development of PEB. The issue of infrastructure is particularly relevant in the areas of waste management, transport and energy supply. In turn, supply systems (people mostly shop in supermarkets) determine the range of available products, design, packaging, etc. Consequently, as supply systems become more sustainable, wider opportunities for PEB open.

PEB should be strengthened in society's everyday practice, promoting:

• a decrease in consumption volumes in population groups with higher incomes;

• changes in the structure of consumer spending, redirecting spending to consumption sectors with lower environmental impact and promoting the availability of PEB oriented (eco-efficient) sustainable products and services on the market (technological solutions, delivery systems and infrastructure);

• decommercialization of meeting the needs of the population, developing product sharing, intensification of use and reduced use;

• development of sustainable value orientation in society, strengthening a non-materialistic lifestyle.

**Conclusions**

The results of the municipal household PEB questionnaire and in-depth interviews in Valmiera and

Liepaja cities allow us to draw certain general PEB **research-and-development conclusions.**

1. While the two cities studied are really different as a complex socio-ecological systems, except that both have a pro-environmental orientation inclination, most of the **PEB basic sector characteristics are similar** or with similar tendencies, **except for lifestyle cluster.** Basic infrastructure cluster sectors, where clearly understandable differences are due to the town's size and type, settlement structure, etc., both cities are facing first of all main typical urban environmental issues – dust, noise, odours, unsupervised street pets, but already much less waste, water, heating related ones as statutory municipal responsibility.

There are real PEB differences, as per the answers provided by respondents – newly introduced/accepted non-traditional environmental sectors and sustainable consumption clusters-oriented sectors (lifestyle cluster) as being not system-based developed yet and definitively less or/and differently approached.

2. There is to be necessary further and selectively detailed PEB governance improvement of traditional environmental sectors, but, particularly, **both newcomer-PEB sectors of municipal governance – new environmental and consumption clusters' sectors,** having high climate impacts e.g., households' lifestyles, mobilities, food & drinks consumption. This requires interest groups-based interactive governance process in the municipalities, what have been really recognized in post-research period in both municipalities - including **PEB step-wise integration info all and each of governance processual cycle stages**, particularly for necessary well-designed SES-based monitoring stage, what could be well used also for public monitoring involvement, including participating Eco-schools as discussed by them too.

3. The assignment of traditionally used governance instruments – such as regulatory and informational ones - is clearly not enough to succeed with PEB. **A whole set of complementary governance instruments is necessary for the PEB governance framework.** The proper and selective considerations of design and implementation quality of this set of instruments and their intercommunication are the main success precondition. Policy and regulatory, institutional and administrative, planning, economic-financial, infrastructure and technological ones, as well as, set of communication instruments, are forming the **PEB governance framework.**

4. Even though in both cities as similarly in the national PEB survey done before, most households consider themselves almost or directly environmentally friendly, but this **high environmental self-evaluation does not always translate into PEB.** This internationally known value-action gap is traditionally explained by the psychological, social, and physical barriers that limit the development and spread of PEB in society**.** Our PEB studies revealed a more detailed list of barriers.

5. Traditional and well-known PEB barriers as infrastructure, economic, information, education (incl. psychological, social, etc), etc., are just a part of those recognized during PEB studies. The **whole set of PEB barriers**: **policy and regulatory, institutional and administrative, planning, economic-financial, infrastructure and technological, and, set of communication barriers** are responsible for limiting PEB developments in the municipalities studied. It's understandable, but still encouraging that this set of six main groups of PEB barriers directly comes together with the same set of governance/PEB instruments.

6. Some of the PEB actions are more attractive than others for citizens, also for municipalities and other actors, so that one person or organization can easily accommodate parallel environmentally damaging and sustainable behavior. The motivation to protect or improve the environment is rarely the primary motivation for people's PEB, but it can reinforce it. **PEBs are often motivated by the desire to save money, improve health, increase property value, or gain recognition from others.** Much more attention should be paid to the socio-psychological factors of people's decision-making (feelings, desires, social pressures and norms) – actually, for all communication instrument's orientation and selective usage.

7. Even further developing and also use of non-traditional information instruments its insufficient for changing behaviour. A complementary set of action oriented and collaboration development instruments should be more developed and applied - our environmental & PEB communication collaboration model (Ernsteins, 1999) includes, **besides information also education & training instruments, involvement & participation instruments, and PEB practice demonstration instruments,** which all are to be complementary and adjusted to the societal groups.

8. Household behaviour is driven by a complex set of factors and they vary depending on the different interest groups of society. First, we recognize five main and wholly complementary societal stakeholder groups or governance segments: **households-inhabitants, governmental and also municipal segments, business-entrepreneurs segment and nowadays also mediator's segment too.** Further on, we shall consider various and very many specific interest groups within those governance segments and within various socio-ecological systems those particular groups live and perform. We should consider this societal heterogeneity very carefully and not only around interests, but also taking into account behavioral history, traditions, age, family types etc., when planning the PEB communication process and instruments - very selectively targeting and performing for this **high societal diversity and applying related complementary communication instruments.**

9. Pro-environmental behavior should be strengthened in overall municipal planning and management practices by facilitating a tailored PEB policy

approach to bridge behavioural gaps and overcome PEB barriers. Those and other PEB weaknesses shall be **regularly monitored and appropriately integrated into the entire municipal development (and environmental) governance process,** including integration into each of all the process stages from situation analysis, policy design, planning, till implementation management and monitoring. Importantly, the key PEB success **precondition** is recognition and application of **all three complementary governance dimensions** – Tripple - Dimensions Governance **(TDG)** framework model as also PEB governance framework - governance sectors, governance stakeholders, and governance instruments.

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