JSACE 1/28

Investigation of Social Opinion on Green Lifestyle and Eco-friendly Buildings. Decision Making Criteria

Received 2020/12/07

Accepted after revision 2021/01/19

# Investigation of Social Opinion on Green Lifestyle and Eco-friendly Buildings. Decision Making Criteria

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http://dx.doi.org/10.5755/j01.sace.28.1.28092

The present paper develops decision-making criteria through literature research to assess the social opinion on green life style and eco-friendly buildings. Validity of criteria was ensured among company executives and academic staff, based on elaborated criteria small pilot survey was performed and analysed. Current research focuses on the influence of demographic variables (e.g., age, gender) and individual subjective characteristic factors; external influencing factors (e.g., social norms, policies) are not used. According to the research results, our concept helps to outline the most crucial factors in industry regarding customer subjective requirements on eco-friendly building and innovative building materials. Nowadays companies need to meet customer requirements in order to adjust them in terms of eco-innovation approach and industry's green ecosystem development and remove the gaps in value preposition. This paper helps to investigate respondents' awareness, requirements, and willingness-to-pay for the eco-friendly houses.

**Keywords:** sustainable development, eco-friendly-house, green life style awareness, eco-innovation, willingness to pay, eco-feedback

## Introduction

Eco-friendly homes need to be integrated with energy economical technologies to avoid wasting resources and increase customers` comfort. Though the green-house technologies and assessment tools are utilized in the housing market, problems like cost, comfort and performance expectation issues in client behaviours should be disclosed.

The aim of the study is to identify factors that influence the decision to choose green lifestyle, new eco-building materials and discuss them in focus groups in order to develop a valid questionnaire. The main task of the study is to develop a valid questionnaire for opinion assessment. The present research develops a questionnaire survey, investigates the willingness-to-pay (WTP) and awareness factors that have the influence on Eco-friendly houses. Respondents' priorities and awareness towards eco-friendly houses: like eco design, air ventilation, sound protection, illumination, and also the management of house performance are known, analysed and discussed. According to the respondents' awareness and factor priorities, along with behaviour model the conceptual guidance for eco-friendly developers, designers, and engineers in developing Eco-house with best performance and price may well be elaborated.

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Journal of Sustainable Architecture and Civil Engineering
Vol. 1 / No. 28 / 2021
pp. 56-71
DOI 10.5755/j01.sace.28.1.28092

The full research design is explained on Fig.5, but shortly - we built a conceptual model (Fig. 2) for the questionnaire dimensions, then used Systematic Literature Review as main methodology to elaborate criteria for the survey and validated them in focus groups (during 2 weeks, interviews among company executives and academic staff were conducted). The authors chose *triangulation* to ensure the research validity and reliability (data validation through expert focus groups, expert interviews, and feedback from pilot groups). After obtaining the survey questions, we conducted a small pilot study among respondents to ensure that all questions are finally valid and to have preliminary results for the upcoming big scale survey which will be performed later. Our future research direction will be to identify correlations among factors.

Recycling and energy efficiency are the most contemporary approahes important for the European Union green policy in order to enhance environmental sustainability (Hinchliffe and Akkerman 2017). In this context, engineering products with eco-efficiency, selection of environmental-friendly materials and technologies to meet requirements with a low environmental impact is extremely topical. So, there is an increased consideration of the design concept and material selection concurrently at the early stage of the product development (Shqipe Buzuku 2017). As a result, eco-design tools are necessary to minimize the environmental impact due to the product's materials and related processes. But these tools need to satisfy customers and collaborate with the entrepreneurial ecosystem in order to create a circular economy. Geissdoerfer (Geissdoerfer *et al.* 2017) defined a circular economy as "a regenerative system in which resource input and waste, emission, and energy leakage are minimised by slowing, closing, and narrowing material and energy loops. This can be achieved through long-lasting design, maintenance, repair, reuse, remanufacturing, refurbishing, and recycling." A circular economy is built upon industrial ecology, eco-efficiency, cradle-to-cradle manufacturing, as well as sustainable production and consumption (Kuo and Smith 2018). The provision of information about others' energy consumption and one's own performance, a process called eco-feedback, could thus improve household energy conservation (Kuo *et al.* 2018). The collaborative environment with clusters of industrial technologies, materials and engineering reveals up possibilities to upgrade the eco-house practices of companies towards an customized innovation strategy requiring understanding of market demand structure. Another objective of innovation strategies is to promote the increasing awareness of sustainable materials, using different activities like dissemination of results, virtual and physical user-experiences with models, prototypes and concepts (Cicconi 2020). Only several studies have been conducted to explore the relationship between eco-house factors and energy consumption behaviour (Shen *et al.* 2020).

However awareness and dissemination can raise residents' sense of responsibility to increase energy efficiency to some level, but such efforts seldom translate into changing the responsible energy consumption of a customers (Azar and Al Ansari 2017). Usually in situation when individuals realize environmental impact and receive information on how to improve one's own eco-behaviour, their could change their behaviour (Asensio and Delmas 2015). For instance, a study conducted in Sweden showed that although households have awareness of the issue of energy conservation, they lack sufficient knowledge about how to reduce their energy consumption (Vassileva and Campillo 2014). Many research shows that lifestyle and perceived value of comfort define an individual's participation in energy-saving programs and products (Thondhlana and Kua 2016). Overall eco-environmental behaviour and attitude is positively related to willingness to buy energy-efficient products (Trotta 2018).

In this paper, the research focuses on current awareness of sustainable materials and eco-building usability and maintenance. We also try to assess factors which customers find important when selecting appropriate building in order to provide guidance for eco-friendly house developers.

## The eco-friendly framework

To provide a more precise understanding of the consumer behaviour towards eco-friendly products and services, we provide a concept analysis. The eco-innovation approach has been emphasized since the 1990s based on the concept presented by Claude Fussler and Peter James (Fussler 1996). These authors determined that eco-innovation is a 'process of developing new products,

processes, and services, which generates value for the company and for the customer, along with a reduction in environmental impact' (den Hond 1997). Bitencourt (2020) sees eco-innovation as 'research and contribution for ecological economics' (Bitencourt *et al.* 2020). They investigate the main drivers (capabilities and resources) and results (consumer value) of eco-innovation.

Another significant factor of **ecological awareness** – acknowledge of environmental impact of on ecosystems (Carson 1962), is one of the aspects which affects consumers' decision. We have a practical approach to consumer choices; consumer behavior research could be concentrated more on studying actual product decision rather than environmental attitudes (Rokka and Uusitalo 2008). Move towards understanding 'actual behaviours within their decision-making contexts' (Lockrey *et al.* 2018).

There are a plenty of strategies designed to implement sustainable development, such as the case of eco-efficiency 'which establishes the relationship between economy and ecology' (Vasquez *et al.* 2019) (Vasquez *et al.* 2019). In 1898, a theory of communication called the AIDA model (Attention, Interest, Desire, and Action) was developed based on a study of the life insurance industry that describes the cognitive phases experienced by an individual receiving a new idea or a new product (Michaelson and Stacks 2011). According to Heath and Feldwick (2008), the AIDA (Awareness, Interest, Desire, and Action) model contains 'a four-step formula to get attention, attract interest, create desire, and then take action' that is the purchase (Heath and Feldwick 2008). This model is very crucial in assessing the impact of advertising since it is helping to control every step of the psychological transformation up to the purchase made by the individuals (Kojima *et al.* 2010). Although the model is very old and has a variety of modifications, the basic principle remains unchanged and is still useful nowadays, so we use it to explain a customer decision process.

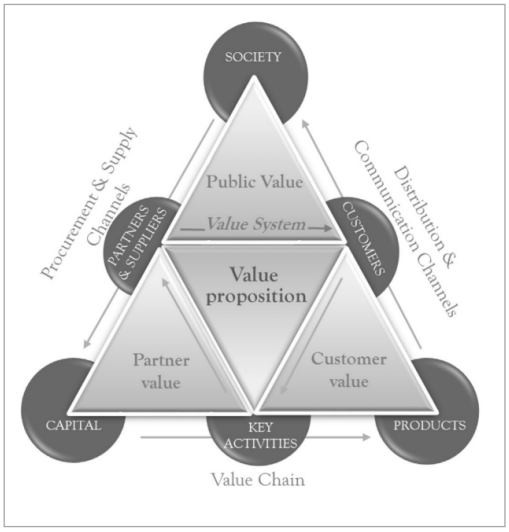
Another widely adopted socio-psychology theoretical model is the Theory of Planned Behaviour (TPB) (Ajzen 1991). The TPB suggests that 'an individual's behaviour is entirely determined by intention and perceived behavioural control', and the willing to buy is also defined by perceived behavioural control, individual`s attitude and other subjective norms. Customers still need to receive awareness of a product, then show interest in the product according to the benefits of the product, and then show a desire to have these products since they satisfy they demand and decide to purchase (Michaelson and Stacks 2011). However, Echegaray and Hansstein (2017) argue 'there might be a gap between an intention and behaviour since an intention to do something cannot always be translated directly into action' (Echegaray and Hansstein 2017). It means that even if a customer is willing to pay (intention or desire), the action itself could require something more. There are also external factors important for society in eco-innovation, besides personal satisfaction. The Human Development Index (HDI) demonstrates that eco-innovation is promoted in countries with environmental problems (Sarasini 2009, Bitencourt *et al.* 2020). As methodological research Gimenez (2012) recommended to take into account eco-innovation and relationship with 'eco-demands of all stakeholders' (Gimenez *et al.* 2012). So, in these countries it is necessary to provide more advantages to raise awareness and it should be a significant part of the research.

Based on the results of the 20 BM frameworks analysis, Biloslavo et.al (2018) proposed a new BM framework termed "Value Triangle" (VT).(Biloslavo *et al.* 2018). The VT (Value Triangle) defines 'co-create value within a business ecosystem that includes society and natural environment' (Stubbs and Cocklin 2008). More specifically, the Value Triangle is showing how company co-creates and co-delivers value with its stakeholders and capture economic value from it (Fig. 1).

The framework is developed by using Richardson (2008) three main components: value proposition, value co-creation and co-delivery system, and the value capture system (Richardson 2008). The value proposition includes: Public value, Customer value, Partner value. Value created by a company is delivered to different stakeholders. In the Value Triangle value is received by customers, partners, suppliers, social actors and by the company itself (Biloslavo et al. 2018). From Biloslavo (2018) analysis is

concluded that the knowledge relating to the sustainability and eco-values as such a collaboration, co-creation, are drivers to deliver a sustainability.

We also believe the current study gives basis for rethink and change the company' behaviour forward to the process of developing a eco-system according to the sustainability, but we wish to contribute more in this research in Customer Value proposition. The innovation is, of course, considered as organizational involving the reorganization of structures, processes, new approaches of management, organizational systems (Klewitz and Hansen 2014, de Oliveira Brasil *et al.* 2016). In order to build green value proposition for customers or society, designers and engineers should propose certain tools for eco-innovation.




Source: (Biloslavo *et al.* 2018)

Fig. 1
The Value Triangle (VT)

According to scientists 'eco-innovation has the capacity to attract green profitability by reducing the environmental impact and creating value for customers and reducing costs' (Andersen 2008, Arundel and Kemp 2009). So, we expect to build a customer behaviour model which is strongly linked to the eco-innovation concept and creating value for customers while reducing costs by investigation of main drivers that affect customers decision.

## The customer behaviour model for eco-innovation products

As one of crucial aspects, our model is consideration that environment-related behaviour could be culturally and regionally different (Gallego-Álvarez and Ortas 2017). Thus, variation in the level of individualism among countries could influence the eco-innovation results (Bitencourt *et al.* 2020). The difference between country awareness and individual responsibility is possible to overcome through dissemination of knowledge about awareness and eco-efficiency (Cucuzzellaa *et al.* 2020). Nonetheless, consumers tend to focus on egoistic product attributes (Schuitema and de Groot 2015). Willingness to pay (WTP) is usually seen as the Hicksian consumer surplus measure, and is often defined as the actual price paid (Atinkut *et al.* 2020), so in some countries individual responsibility will prevail over egoistic decision (e.g. price).

The studies we examined/overviewed have demonstrated that customers behaviours in energy and water consumption of eco-houses, their awareness, perceptions, according to environmentally friendly products are important (Scott and Vigar-Ellis 2014). Customers who respect environment are purchasing the eco-friendly products. Awareness of an individual in concerns about the environmental is one of the determinants for environmental friendly behaviours (Leszczyńska 2015). Koenig-Lewis et al. (2014) also supporting environmental friendly behaviour correlation with willing to buy purchase practice and it is affected by social concern, not only rational. (Koenig-Lewis *et al.* 2014). So, we put these factors as other non-price factors affecting a customer choice (Fig.2).

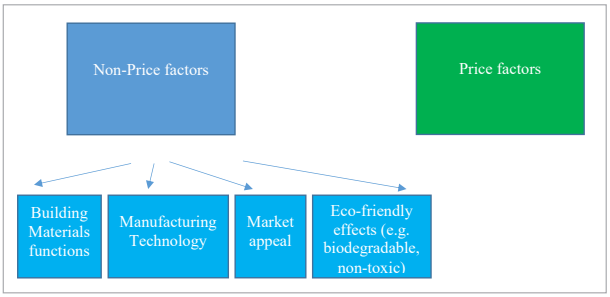
Perceived benefits are an important factors of willingness to buy eco-friendly products (Kayaman and Arasli 2007, Kearney 2014). Packaging materials, manufacturing technology, and market appeal are necessary criteria (Nguyen *et al.* 2020) to be incorporated into the model. The studies examined also showed that consumers are willing to buy an eco-friendly products as long as the quality is higher than usual products (D'Souza *et al.* 2007), so quality should be considered. Van Birgelen et al. concluded that 'Consumers are willing to trade off almost all product attributes in favour of environmentally friendly packaging of beverages, except for taste and price.' (van Birgelen *et al.* 2009).

Young (2008) showed customers of unbranded products are showing less than 10% environmental aspect interest (Young 2008), as a result design is one of the significant factors in the model.

Individual values are also important in defining eco-friendly behaviours (Zhang *et al.* 2018). Individual subjective factors such as the degree of awareness, responsibility, environmental values, external factors have important role in affecting eco-friendly behaviours (Zhang *et al.* 2018).

Fig. 2

The customer behaviour model. Choice is affected by cultural differences and individualism. Source: Developed by the authors based on classical models and the Value Triangle




Source: Developed by the authors based on classical models and the Value Triangle

In order to build a final model of customer behaviour (Fig.2) we chose rationalisation - we decided to use the classical model with certain eco-benefits (customer values on the left) and perceived consumer costs (Scott and Vigar-Ellis 2014, Magnier and Crié 2015, Lindh, Olsson, *et al.* 2016) on Fig. 2.

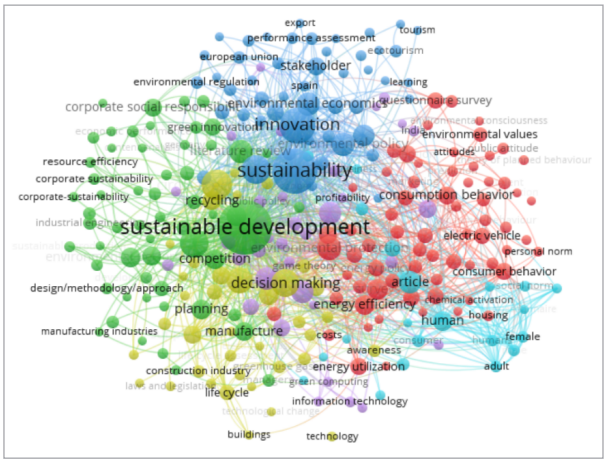
So, the main aspect in our model is price and non-price factors decision. In order to make model simple, we grouped all factors into several dimensions: building materials functions (benefits), manufacturing technology benefits (green values), market appeal (design and quality), and factors with eco-friendly effects (e.g. biodegradable, non-toxic, energy saving, and other environmental values the could be important for customers).

## Literature Review methods on eco-friendly products and services

In this paper we do not focus on factors influencing certain pro-environmental behaviour or price-based behaviour. There is a plenty of research that indicate limited value of sociodemographic characteristics for defining environmentally friendly behaviours of customers (Stern *et al.* 1995). Other studies focus only demographics factors (McDonald and Dunbar 2012), these studies showed that the willingness to buy eco-friendly products is highly related to demographics. The results concluded that the age group and marital status have an great impact on willingness to buy eco-friendly products (Shahsavar *et al.* 2020). Non/demographic factors that influence eco-friendly behaviours, were grouped as 'psychographics, knowledge, beliefs, and attitudinal variables' (Laroche *et al.* 2002, Szerényi *et al.* 2011). Later, 'perceived consumer effectiveness, environmental knowledge, and environmental concern' were also respected as important variables on eco-friendly behaviours, while environmental concern was the most respected (Do Paco and Raposo 2009, Meyer and Liebe 2010) followed by perceived consumer effectiveness (Albayrak ***et al.*** 2011, Fisher *et al.* 2012). Some studies also showed that the education level and income level have a positive impact on the eco-friendly behaviour and eco-friendly willingness to buy as well as demographics (Chan 2001, Junaedi 2012, Tran 2014). So, we tried to go through phenomenological approach, and did not put any theoretical findings as hypothesis. But we payed attention to the educational level, age, and other factors as possible correlations.

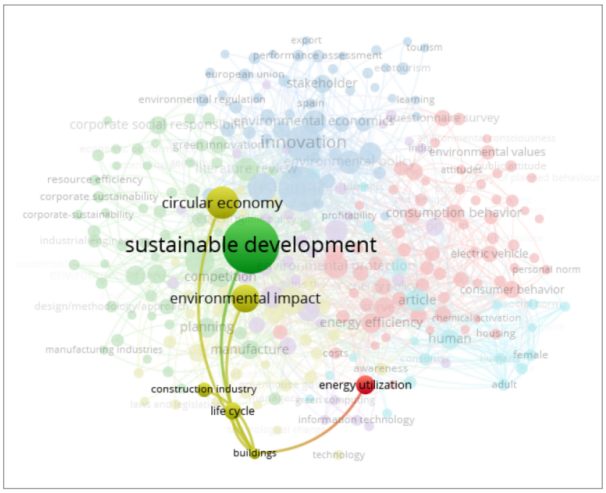
Fig. 3

Preliminary search results




Source: developed by the authors using the VOSviewer

*The literature research* in order to reveal theoretical findings for the questionnaire was performed from the 1rst of June 2020 till the 20th of June 2020. The first stage of our literature analysis was using keywords in the Web of Science database: awareness, Sustainable development. We found 217 116 papers, which was a rather considerable amount. After adding a new keyword – "eco" we found 19 636. During the introduction phase with the most relevant papers, new keywords were found: Ecological awareness, eco-innovation, willingness to pay, and eco-feedback.




Source: developed by the authors using the VosViewer

Fig. 4

Preliminary clusters search results for buildings

After the preliminary search, we started to narrow the search and used the following search formula according to our research goals: *( eco-innovation ) OR ( eco-house OR eco-building ) AND ( ecological AND awareness )* with 674 papers. After using the content analysis platform, we found 6976 links and 6 clusters with 271 items (Fig. 3) in the VOSviewer software (Web of Science database).

In order to build a framework, we chose most relevant links (Fig.4) in the VOSviewer results.

As it could be seen, the most relevant clusters include several common links as keywords. After selecting most relevant papers based on results (40 papers in the Web of Science) we synthesised the following criteria and used dimensions (groups) created throughthe concept analysis (Fig.2) - Table 1 shows the elaborated criteria based on our literature review (for full list of factors see Appendix 1).

Table 1

Elaborated criteria based on the systematic literature review

| Authors | Dimensions/groups | | | | |
|---|---|---|---|---|---|
| | Price | Building material functions/ functionality | Manufacturing Technology | Market appeal/design/ appearance | Eco-friendly effects/ environmental impacts |
| (Nguyen *et al.* 2020) | yes | Functionality | New and advanced technology for production | Visually attractive graphic design | Biodegradable, Non-toxic, easily decomposed, Reusable Recyclable, Paper-based, Natural and organic sources of materials used in production, |
| (Scott and Vigar-Ellis 2014) | yes | No data | Eco-friendly manufacturing process. | No data | recyclability and reusability |
| (Young 2010) | yes | No data | No data | No data | Mostly recycling |
| (Lindh, Williams, *et al.* 2016) | yes | No data | No data | design | Reusable |
| (Magnier and Crié 2015) | yes | Yes, enlargement | No data | Design, shape, size | biodegradability, recyclability and reusability. |
| (Lewis and Stanley 2012) | No data | No data | No data | No data | biodegradability, recyclability and reusability. |

| Authors | Dimensions/groups | | | | |
|---|---|---|---|---|---|
| | Price | Building material functions/ functionality | Manufacturing Technology | Market appeal/design/ appearance | Eco-friendly effects/ environmental impacts |
| (Bertolini *et al.* 2016, Herbes *et al.* 2018) | | | | | Life Cycle Assessment |
| (Palombini *et al.* 2017, Boesen *et al.* 2019) | | | | | Eco-friendly raw materials |
| (Mueller *et al.* 2010, Reimann *et al.* 2010, Gwozdz *et al.* 2015, Tait et al. 2016, Wagner *et al.* 2019) | | | | Design Subfactors: *S1 minimal/ minimalistic - reduced,timeless silhouettes S2 durable – robust, high-quality fabrics S3 multi-functional – functional (e.g., reversible) garment S4 dynamic – good fit/size (e.g., adjustable for mobility or growth) S5 unique – uncommon style S6 decorated - xcreative/* (Wagner et al. 2019) | |
| (Verghese and Lewis 2007) | | Functionality | | | |
| (Martinho *et al.* 2015) | | Mostly price | Quality, functionality | design | sustainability |
| (Chalal *et al.* 2020) | | energy consumption | Heating system, energy ratings, energy usage in KWh | | Energy savings, efficiency control e.g. through smartphone |
| (Atinkut *et al.* 2020) | | | | | Social responsibility of respondent (Cognitiveness): knowledge of eco-efficiency, perception and attitude of environment (positive/neutral), conscience (concerned, not concerned), eco-experience. WTP factors: gender, age, education, family size, source of income |

| Authors | Dimensions/groups | | | | |
|---|---|---|---|---|---|
| | Price | Building material functions/ functionality | Manufacturing Technology | Market appeal/design/ appearance | Eco-friendly effects/ environmental impacts |
| (Gill *et al.* 2010, 2011, Ridley *et al.* 2013, Elsharkawy and Rutherford 2015, Pretlove and Kade 2016) | | Smart heat control (over-heating), water and energy use. PV avail-ability. The Passive House Planning Package | | | |
| (Maruejols *et al.* 2013) | | | | | Green efficiency |
| (Huebner *et al.* 2013, Jones *et al.* 2015) | | Thermal comfort | | | |
| (Zeng *et al.* 2018) | yes | Window blinds, retrofit fabrics, more efficient equipment, indoor air quality (venti-lation), smart temperature, acoustic, reliability (guarantees), use of land | | Visual, aesthetic, decoration | |

Source: developed by the authors

## Discussion and validation of the elaborated criteria: the Case of Latvia

*The Empirical research* based on theoretical findings was performed from the 5th of July 2020 till the 20th of July 2020. Expert interviews and focus groups for data validation were conducted from the 5th of July 2020 till the 20th of July 2020. The authors' scheme of research design could be seen on Fig. 5.

Multiple techniques were used to improve the construct validity and reliability and improve scien-tist' judgments and data truthfulness. In order to validate the survey instrument in the same type of atmosphere and execution in which it was designed to be used, a **pilot test** conducted on small respondent population was run. During 2 weeks, interviews among company executives and aca-demic staff were carried out. All respondents agreed to evaluate the survey questions. The analysis of the independent variables in the pilot test suggested that 7% of questions needed some further clarification (see Table 2). Prior to moving forward with the actual research, these questions were re-written and given during the interviews for cross-checking and clarity review.

Prior to obtaining the final results, the authors used the modified questionnaire, for the survey ques-tions. The authors modified the original method with statistical evidence. Based on provided feed-back during the interviews, the authors stated that the pilot survey showed a deep consideration about the green-style. This situation was recognised by the authors as a sign of good awareness about the green-style.

Table 2

Questions needed to be modified based on the pilot survey

| Description of original questions |
|---|
| 1H. Long life cycle and cost management (repair) (20% of misinterpretation) |
| 1K. Passive house benefits. (40% of misinterpretation) |
| 4E. Eco-efficient production processes and raw materials in connection with the use of natural resources (eco-efficiency) (15% of misinterpretation) |
| 4F. Corporate social responsibility through participation in associations and government environmental programs (30% of misinterpretation) |
| the authors developed evaluation based on interviews, with evaluation from five-point Likert scale (1 – not important, 5 – strong) |

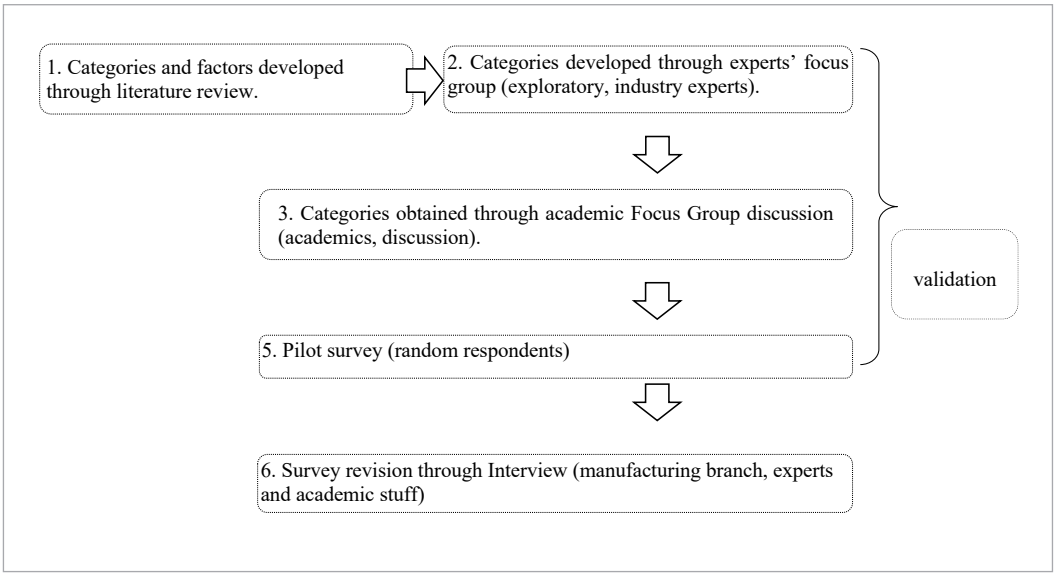
Source: developed by the authors

**the expert survey and reference groups** are the second most important research phase. With the help of the experts representing a building industry, the authors identified the significance coefficients of the factors influencing customers' behaviour.

The objective of the interviews was to explore the factor evaluation practices in the building industry in Latvia, so that this information could be used to develop a questionnaire for the quantitative study. On the basis of the information provided by the experts and recommendations regarding enterprises, a list of corrections was suggested. The expert reference group (5 experts) discussion allowed to improve validity of the research. **During the interviews and expert focus groups**, the authors repeated or clarified questions that may have been unclear to the respondents. The recording device was used during interviews, but the authors entered those interviews results manually as text conclusions into standard word processing documents. The purpose of the questions was to determine experiences, perceptions, and the ideas of executives and non-executives about the process of selecting and assessing certain eco-house benefits. The authors chose *triangulation* to ensure validity and reliability of the research (data validation through expert focus groups, expert interviews, and feedback from pilot groups.

Fig. 5

The scheme of the research design




Source: developed by the authors

After the discussion with the experts, new questions were added: 2D. Total quality management production. Production certificates; 2E. Synchronization and continuity of the production process. Smart factory, robotization, high production quality and 4F. Corporate social responsibility through participation in associations and government programs that protect nature.

## Interpreting the pilot results

After considering the survey results, the questionnaire was used in the ilot survey. The simple analysis for 15 respondents was presented, the elaboration of eco-innovation marketing strategies was based on the previously created model (Fig. 6 based on Fig. 5. Steps 1–5).

As a result of implementing a new concept of eco-innovation value, now it is possible to assess the impact on different change elements. Fig. 6 (visualization) shows the most important factor contribution.

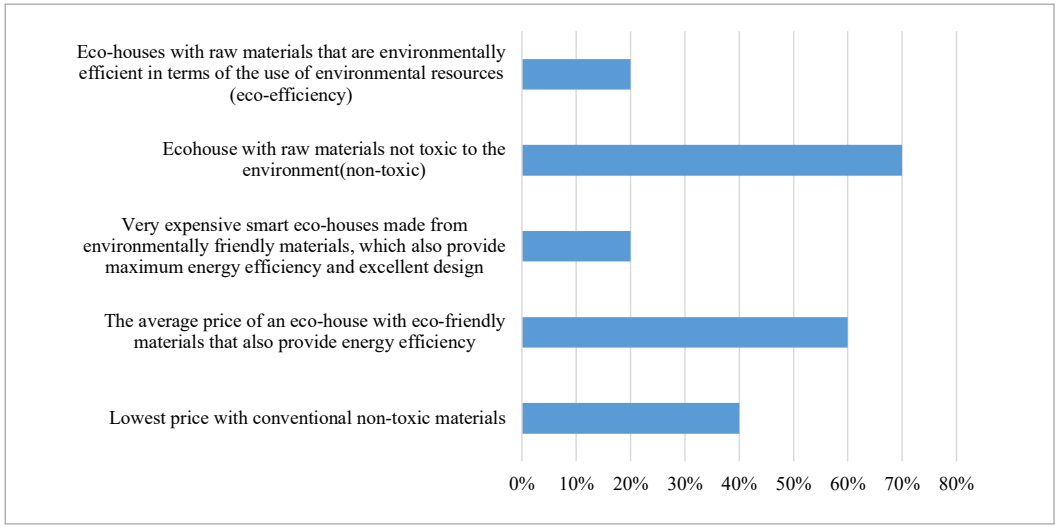



Fig. 6
Most valued factors (5 – very important) in % of total respondents

Source: the pilot survey

Based on the new results, we could evaluate the priority of basic elements (Table 3) according to respondents' subjective values.

| | Priority | Points |
|---|---|---|
| Good price | 1 | 22 |
| Good design | 2 | 21 |
| Very high energy efficiency of materials, components and systems, which can significantly reduce costs | 3 | 18 |
| Eco raw materials | 4 | 18 |
| Smart home options that allow you to automatically remotely control the consumption of resources (heat, electricity, water, etc.) | 5 | 15 |
| Environmentally friendly manufacturing technology | 6 | 11 |

Table 3
Please prioritize answers from 1 to 5

Source: the pilot survey

Lastly, the most valued elements (at least 50% of respondents) are represented in Table 4.

Table 4

Result interpretation for transformational factors

| Question description | % of respondents |
|---|---|
| 1A. Raw materials and components provide good air circulation (ventilation), thus good air quality | 60% |
| 1G. High energy efficiency of materials, heating units and systems (for example, windows, heat resistance of walls, energy efficiency of the heating system) | 80% |
| 3B. Reliable, durable design, high-quality fabrics | 75% |
| 3D Dynamic design (easy to repair, complemented, suitable for various styles); good fit / size (e.g., adjustable for mobility or growth) | 70% |
| 3E. Unique, unusual - uncommon style | 60% |
| 4C. Raw materials not toxic to the environment | 85% |
| 4G. The use of natural raw materials in the product and production. | 60% |

Source: the pilot survey

## Conclusions

The present paper has provided a detailed framework for prioritization of factors based on the literature research with an empirical example for the specific Latvian situation.

First, the authors have observed the eco-friendly/green life style methodology and created the questionnaire design (Fig. 2). Second, the important conclusion associated with the assessment of factors and corrections has been made, and a validated list of factors has been presented (Appendix 1). Third, a new assessment concept has been drawn/elaborated and a short analysis of possible strategies has been proposed, which is convenient for eco-innovation companies. In Latvia, eco-houses with environment friendly materials yet not expensive (Price over Design decision) are more popular than luxury and stylish ones with a high price. Fast response of strategies to rapidly changing market conditions becomes the most demanded topic for eco-house developers. Within the framework of the present research, an integrated framework has been proposed for the wood manufacturing company using the approach augmented with the presented methodology to obtain criteria weights and prioritize alternative elements, which could be used even for eco-innovative companies.

Finally, according to the empirical results, we interpreted results for a better understanding of the certain factor (value) effect on customer behaviour. The proposed approach shows correlation of the existing elements with awareness of pilot study respondents. Majority of the respondents consider green environment (80%). At the same time, they are not willing to pay premium for fully green houses, showing cost orientation. Customers expect "Very high energy efficiency of materials, components and systems, which can significantly reduce costs" which is the 3rd important value. But still – design is very important for customers, especially concerning reliability and repair (75% and 70% accordingly). The limitations of the research can be discussed since Latvia has a specific geo-political and economic position (Global Innovation Index 44 out of 127 and, compared to other EU countries, Latvian R&D expenditure is greatly reduced – 0.4% of the GDP in 2016 (EU, 2018; WIPO, 2017). Future research in the Baltic States could concompany or reject this limitation for greater population. Latvia is a good case for analysis since it has open market with perfect logistic value chains and works as a bridge between Eastern and Western Europe. For this reason, the research results are crucial for wood manufacturing companies in small countries with the target of becoming both locally and internationally competitive in the European markets.

As for practical implication of the research case, it allows eco-innovative companies to assess their strategic posture with the presented method and follow the discussed strategic gaps both for the domestic and international markets. In the future research we will provide a mathematical model based on the factor analysis using SPSS, which will be the example of using our tool for wood manufacturing companies.

Summarizing the results, it can be concluded that preliminary results show respondents' practicality towards green life-style. "Eco building with raw materials that are friendly to the environment are more important" in comparison to "expensive smart eco-houses made from environmentally friendly materials, which also provide maximum energy efficiency and excellent design". Good price (reasonable price) has also the highest priority over sophisticated functionality (smart home option). However, we should keep in mind that the current approach lacks broader population and an external level, concerning entrepreneurial ecosystem values (social values as part of entrepreneurial ecosystem). The authors propose in the future to extend the current approach with the broader population in order to fill the validity gap associated with the behaviour assessment.

Development of a better eco-innovation strategy fitness for Europe's sustainable future is very important for the current green approach in order to forecast the expected profit/performance. By using this tool, international companies will fit their eco-innovation strategies according to the specific environmental feedback from these strategies in the respected countries (or will find themselves with disadvantage in using eco-innovation strategies). Nowadays in dynamic environment advantages in sustainability exists when company is developing a system of eco-values for both customers and society through eco-innovation strategy.

**Acknowledgements**

This publication is created with support of European Regional Development Fund project "A new concept for low-energy eco-friendly house", Grant Agreement No 1.1.1.1/19/A/017.

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