

Development of Sustainable Dwelling in Lithuania

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Key words: dwelling, a dwelling need, housing, sustainable dwelling and sustainable development of a dwelling.

SUMMARY

Cities have always been attractive for people who have wanted to hide away in a “fortress” and, as such, a dwelling can be considered a fortress too. It is very difficult to characterise a dwelling using one precise definition - it is an element of the community’s dwelling area with its own social and spatial environment, in which many different forms of houses, different architectural styles and designs. A dwelling is usually the largest purchase that a person makes throughout his/her entire life. It satisfies one of the major needs of persons thus influences quality of life and can be considered linked with the guarantee of human rights. With changes in the economical environment in Lithuania, the problem of a dwelling has become very relevant. Since Lithuania’s political and economic changes in 1990, very important changes have started to occur in the fields of housing and the granting of public support for housing. However, although such an approach might be very important for the design of dwellings and cities, there has been a lack of analysis so far on the individual approach to a dwelling as a constituent part of one’s life. Today the dwelling’s situation is a diverse one, the dual understanding and changing approach exists for the time being. A dwelling should be chosen and changed “as many times as needed” having in minds the needs and opportunities (as in Western countries). Available job, income, assets and education all characterise both the social status of the family and, consequently, the dwelling situation. In many cases, families having many children, as well as persons belonging to the lower social levels, live in apartments which are of an extremely low standard if judged according to the effective minimal requirements (bearing in mind both their equipment, size and number of premises). Families with greater numbers of members usually enjoy smaller areas than those in the smaller households. However, an approach also exists in parallel that the problems of a dwelling are related to quality aspects, and that such difficulties are also characteristic to the difficulties of relatively rich communities (Gondring H., Lammel E., 2001). The residential real estate market has been developing rapidly in the Baltic States lately. Lithuania has become a full EU member and it is expected that the economy shall strengthen along with the growth of wage. Construction costs and prices of real estate are also expected to increase. It is very easy to foresee that a dwelling, which is already quite difficult to purchase, shall become even more expensive item in the event an increasing divergence between the prices of a dwelling and mean monthly salaries. So, a current goal today is to use international financial support for different dwelling programs and projects, additionally to search for sustainable options for a dwelling (from the economical, social - psychological and ecological point of view) and to accumulate the global experience and apply it in Lithuania in a creative way in order to reach higher standards of economical and social welfare. The purpose of this article is to analyse a dwelling from the economical, social-psychological and ecological points of view and to offer a model of sustainable development of a dwelling.

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1. INTRODUCTION

A dwelling asset has a unique feature – it must satisfy social needs, so the dwelling real estate or a dwelling is of great importance to all of us. It is customary to denominate a dwelling house, its part, apartment in a block of flats or other dwelling area or their groups as a dwelling, in which the conditions for a person or a family are created, such as opportunities to rest, sleep, prepare food, eat and take care of personal hygiene. In the European Urban Charter, the following definition of a “dwelling” is presented: “a dwelling is the personal space of the individual, the place with which the occupant identifies basic urban existence” (European Press Council, 1993). A dwelling is usually the largest acquisition in a person’s life, and the dwelling houses form the largest part of urban construction. It is considered a place of non-service living and, at the same time, a space for privacy.

A modern understanding of housing is very different from that which used to exist within primitive society or in the Middle Ages. In the 19th century, industrial workers were unable to obtain modern dwelling standards. Historical analysis shows that the first dwellings used to depend on natural conditions and materials found in the environment, whilst modern houses are equipped with saunas and “fitness” rooms, programmable computers and other household equipment the purpose of which is to ensure cosiness to our dwelling including punctual coffee preparation, security and energy saving. There are also PCs with Internet connection for banking and shopping at dwelling. This is not a fantasy world. All these items became reality in many cases. It’s hard to believe, but such developments were already foreseen at the beginning of the 20th century (Deubel I., 2001).

A traditional Lithuanian dwelling has been determined by the local natural and climatic conditions, traditions of ethnic culture, and social, economical and technical progress. The main building of the Lithuanian ethnic dwelling stead – cottage – was a dwelling premise for a family or household. Its spatial structure has many features close to the tendencies of a modern design. For instance, the use of a multifunctional dwelling area for family needs, its integration with an area meant for food preparation, as well as the separation of a corner meant for leisure or guests and an opportunity to fit a working place (textile machine), etc. Rationality and heat saving are witnessed by the following (Daunora Z. J., 1998): the integration of a stove and oven for baking bread into one source of heat, and its installation into the centre of a building; a good orientation of buildings in respect to the sun; a well-considered set of furniture (decided by necessity); and sufficient area for auxiliary (economical) premises (porch, boxroom, attic). These are the general features of our ethnic dwellings characteristic to different locations nationwide.

The crucial factor determining housing need is the discrepancy between the available number of dwellings and the number of households. Despite the peak of construction observed during

the last few years, the growth in numbers of inhabitants and households is behind the extension of construction. The need for dwellings is increasing, particularly the demand for small dwellings, because, although family size is decreasing, the number of households is increasing. The major reasons for the decrease in size of households are the very low birth rate and the decay of the family over several generations (it has become an established tradition that major family members start their households separately from their parents; elder persons are also prone to live separately from their children). The number of one-parent families has also been increasing lately. Now in economically developed countries and countries with traditions close to the Lithuania, the mean number of family members is significantly lower than in comparison with the beginning of the last century. For instance, in Austria, only 2.5 persons live in one dwelling, in Denmark and Germany this figure is 2.2, in Finland 2.1 and in Lithuania 2.7. After 20 years, a realistic indicator of a mean should be 2.3 persons per dwelling unit and this would be equal to the Western European standard (Lietuvos būsto strategija, 2002). The second major element of a dwelling need is the change of an old dwelling into a new one. Norms as to what constitutes necessary dwelling areas has also changed. It is much higher in modern society than that which satisfied major needs earlier. One room per one family, a norm which used to exist in poorer times, has changed into another dwelling standard in developed countries – one room per one family member. A premise for functional purposes also has become a standard: one must have a special premise for food preparation and a separate premise for sleeping – a bedroom (Melnikienė R., 2000).

The modern attitude of Lithuanian people towards this issue, and especially their economical capacity, is unknown at present. Many blocks of flats and one-flat houses, which are under construction and as yet unfinished, show the experienced stage of a perverse economy and motiveless needs. A new understanding of a rational dwelling is at the beginning of its formation. The Soviet way of thinking is still prevalent in that persons think that they are going to purchase a dwelling once and for forever, so they try to purchase it as large and durable as possible. All available means and power is meant for building and later exploitation of such a dwelling. A dwelling should be chosen and changed as many times as needed according to the available job, needs and opportunities (as it is now in the Western countries) (Lietuvos būsto strategija, 2002). Lithuanian designers of dwelling houses search for ways to implement their own architectural solutions on account of economy of future structure and accommodation of the future inhabitants. So it is quite natural that we lack good examples of new, rational social dwellings. In order to search for own models, one should review the experience of neighbouring countries, develop modern and ecological construction, and solve the organisational problems of construction of a social dwelling.

The structure of apartment construction has changed significantly according to the funding sources (the public sector dominated during the Soviet period). From 1996, construction of dwellings was very intensive thanks to private investments. The dwellings are attractive as investments as with other real estate because of the following:

- Ensures the safety of a capital (durable, opportunity to pre-insure the physical risk).
- Opportunity to rent and receive income.
- Satisfaction of the needs of private life stability.
- Economically valuable: house and land plots retain their value.

- Opportunity to have the asset at one's disposition, to control the investments directly, etc.

Besides this, an own house or apartment is a kind of warranty in retirement. In Germany, for instance, seven citizens out of ten live in houses meant for one or two families, such houses are built in rows respectively, families are co-owners of such building (average 47%). In total, 97 % of Lithuanian dwelling fund is private. The proportion of owners is twice as big as in Spain and Ireland; in France it is approximately 55%. In Germany, house construction is much more expensive because of high prices of the land plots. Based on the results of polls it is determined that the families and persons with high income wish to have own houses (mean age of such persons is 30-40 years). In Lithuania, the dwelling houses having total area of 120-200 m² are the most popular ones.

The opportunity to purchase a dwelling and suitably maintain the available one, renovate or modernise it is directly connected with both the economical-social status of a country and income of its inhabitants. The income of Lithuanian inhabitants is only 32 % of the mean income of EU citizens. The mean price of a dwelling in block of flats is eight times higher than an average income of a household, and the prices of the new individual houses – even 20 times higher (this ratio does not exceed 4-5 times in the EU countries). According to the data as per 2002, there was 22.5m² of useful living space per one inhabitant of Vilnius, but this is still half of the European average.

2. A SUSTAINABLE DWELLING

Households create the places of personal cosiness themselves (part of premises serves for representation, the other for the living of all the family members). The design of houses and apartments is adapted to increased individuality. Such functions as food preparation, eating, sleeping, hygiene, communication, etc. were separated into special premises. Separate rooms are for separate persons, i.e. parents and children, sons and daughters and, in many cases, wives and husbands. Such divisions of functions and persons are a good precondition to even more private dwelling space. This could be one of the features of a sustainable dwelling (the Latin word *rationalis* means “clever”, thus a sustainable dwelling is a dwelling planned in a clever way). Hence one is able to characterise a sustainable dwelling as an available (sufficient supply and information on it), top-quality (in technical and supply level), economical (opportunity to cover purchase and exploitation expenses for greater number of households), ecological (energy saving, ecological building materials, etc.), comfortable and cosy (having in mind social-psychological aspect) one, which would better suit the needs of a person. Besides that, dwelling houses, apartments or, in other words, dwelling premises, must be set out according to the conditions of that locality and must meet the established technical and hygienic requirements.

In international literature, the definition modern dwelling matches the definition “sustainable dwelling”. Today one speaks about such a dwelling more and more often, this is a dwelling where the private and emotional family life goes on, protected from external factors. There are no duties executed within such a dwelling. One switched to the thought at the beginning of the twentieth century that a dwelling is a place meant for leisure activities and representation. Its form, place, plan, setting out, etc, has an influence on this side of living. At

the same time, a definition of a modern dwelling includes ecological aspects (saving of areas for building, decrease of energy consumption, etc.). One may identify the following characteristics of a modern (suitable) dwelling (Gondring H., Lammel E, 2001):

- *From a social point of view* – an apartment or house is a place for family. A dwelling also has a symbolic meaning of a social status.
- *From a functional point of view* – an apartment or house is a place for leisure activities and rest, not for professional activities (living is separated from professional activities).
- *From a social–psychological point of view* – an apartment or house is a place for privacy and intimacy.
- *From an economical point of view* – an apartment or house is an article. It is reclaimed during purchase or rent.
- These four features above all influence a dwelling.

3. MODEL OF DEVELOPMENT OF A SUSTAINABLE DWELLING

According to the definition presented in the first chapter, a sustainable dwelling should be available matching quality, economical, ecological, cosy, comfortable needs of an individual. Such an understanding differs during different stages of life as well as the values themselves. We suggest that we should analyse the options of a sustainable dwelling in Lithuania by the separate stages of a “dwelling career” (initial, development, strengthening, stabilisation and senescence) based on international experience; or by separate groups of way of living since their representatives perceive the importance of own or rented dwelling differently.

There is a limited opportunity to choose a dwelling in Lithuania (the small rented sector is characteristic to it) because of a lack of implemented renovation of houses and opportunities to move to another dwelling. The encouragement of the latter would change the dynamic of dwelling market and would become a strategic step in order to reach the EU standards in the future. The number of households is 3.7 % higher than a present number of dwelling units in Lithuania. Besides that, it is foreseen that the household size shall decrease in the future. This is determined by an increasing dwelling need. New construction makes only 0.3 % of a dwelling fund (this index is 1-1.5 % in Western Europe). This means that the opportunities to choose a dwelling is limited, quality standards of dwelling funds are declining through a particular period despite the recommendations of the Lithuanian Dwelling Strategy guides to increase the quality and quantitative lack of dwelling market.

Seeking to implement the measures of the Programme of the Government of the Republic of Lithuania for 2001-2004, the Lithuanian Dwelling Strategy has been prepared with the major purpose to determine the long-term purposes and priorities of the dwelling policy. In the study of implementation of purposes, it is stated the following: “Information on long-term programs of dwelling building not found”. So it is difficult to present the information on what kind of houses (apartments) they are going to build, who shall initiate such building, what kind of offer of new dwellings (number of dwelling units) shall appear in the market, etc. There are insufficient data on planned and available land plots for building purposes. No sufficient offer of them. So the effective offer is limited and at the same time the impact on the group of inhabitants having higher income is made (Lietuvos būsto strategija, 2002).

Based on the experience of other countries, it is quite possible to create and apply (maybe even per every town) a model of reasoned dwelling in Lithuania, such a model would assist in answering the questions about foreseen development of dwellings. The new dwelling forms do not emerge in place of the old ones but next to them, so the said model could consist of three parts: private households, dwelling market (existing dwellings) and models of land plots for new buildings (see Fig. 1).

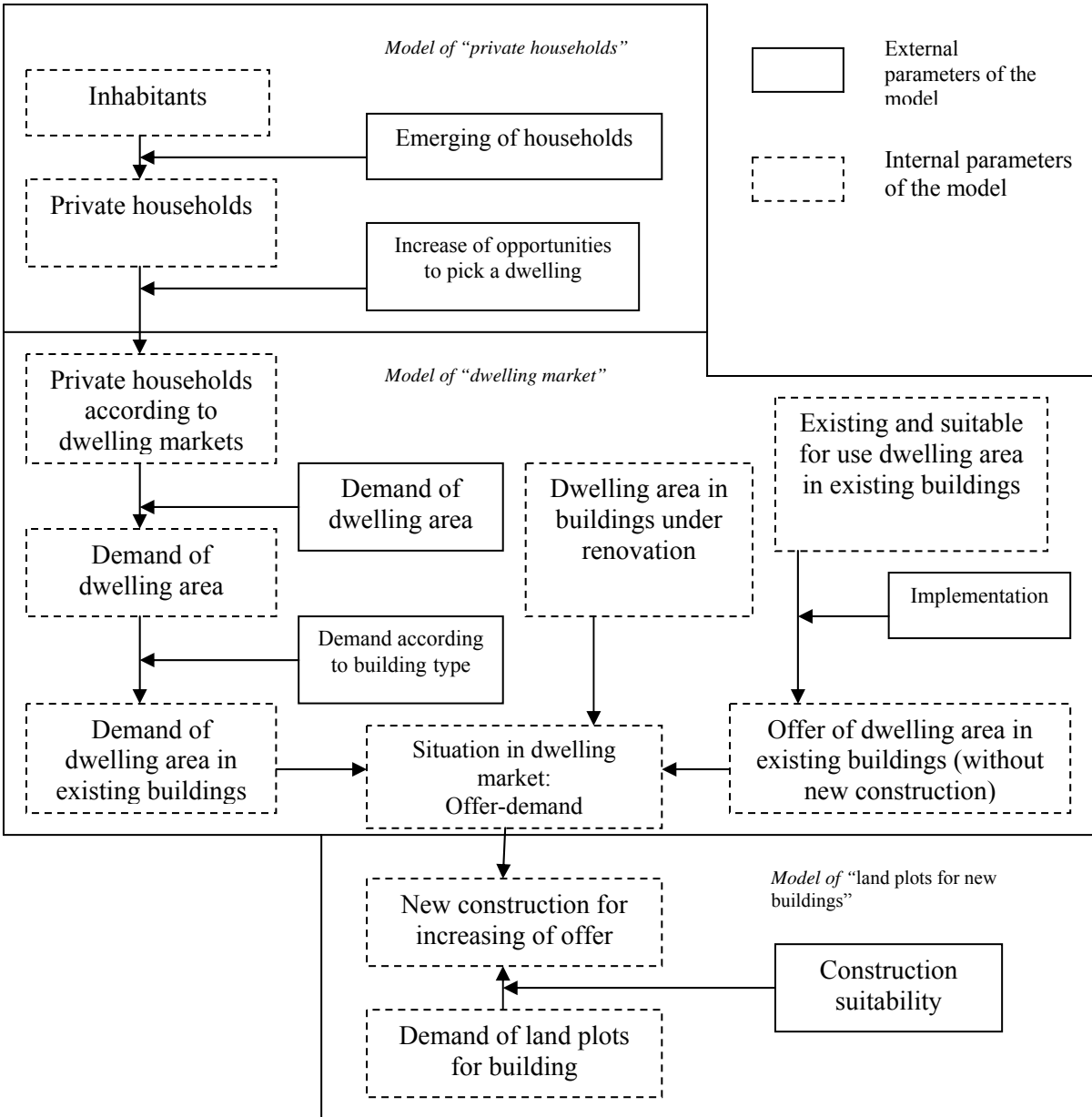


Fig. 1. Model of development of a sustainable dwelling

In the first part of this model, the purchasers of a dwelling are described, i.e. households, which are different by their size (number of members), age, generations living together,

purchasing power and subjective wishes. The following three household groups are important to Lithuanian dwelling market:

- Households presented to the market for the first time (insufficient means to pay for household);
- Households having a dwelling but wishing to improve it;
- Aged people (receive low income and want to move, for instance, to smaller and cheaper dwelling).

This needs a variety of dwelling offers.

The entire dwelling market where the predictive households act as the potential purchasers is divided into rent and property markets appropriately. Firstly, one should analyse the property forms (97 % of the Lithuanian dwelling fund is private). A dwelling demand is based on the size of dwelling area, so demand is the second parameter of the model. An area depends on size of households, location and part of dwelling market (rented or property) and must meet the wishes and financial muscle of the inhabitants. The following results from the described above see Fig. 2.

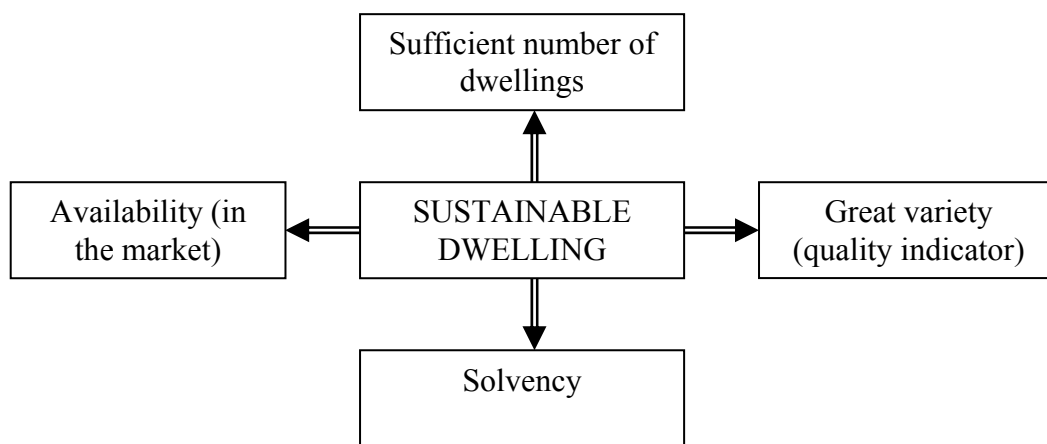


Fig. 2. A sustainable dwelling

A sufficient amount of dwellings should be present in the market as well as their variety according to type (house, apartment, cottage, etc.), form of possession (own, rented), standards (of accommodation) and location. A valuable dwelling means that there is a sufficient offer and information on it, also an opportunity to change the dwelling if circumstances also change, and cover the purchase and exploitation costs. At this stage a special decision support system could be used in order to assist in the choice of the best option of sustainable dwelling (it is described in the next chapter).

In the offered model of a sustainable dwelling, it is advisable to highlight the structures under renovation because poor construction quality and bad engineering installations are characteristic for many dwelling blocks of flats, as well as low energy efficiency (no thermal insulation), no large-scale adequate reparations, high energy losses in the central heating systems and hot water production units. This is also included into the National Strategy of Harmonious Development.

Change of an area demand (in the existing and suitable for use dwelling buildings, as well as in buildings under renovation) during some certain period determines even greater demand or demand for an unoccupied area (in the event of emergence of more attractive apartments in the market, the same percentage of already existing apartments shall also be available for sale). When demand exceeds the existing offer, a demand for newly built dwellings emerges in order to satisfy such demand.

New land plots in settlements are needed for the building of the new dwellings (land plots for houses and infrastructure). There is a close coherence between new and already constructed land plots and needed land plots for construction. So-called construction density is a very important factor. One should also pay attention to the location of new structures and the kind of already available ones (houses for one or many families). Speaking about a new dwelling with minimal costs, one should pay attention to the fact that new buildings are extremely expensive (land price makes only 3 % of all production expenses, infrastructure 23%, building expenditure 50 %, other expenses 8 % and taxes 16 %). There is a low supply of land plots in really good locations, along with a very long and difficult order of issuing of licences and permits for construction. After analysis of the parameters of the model of a sustainable dwelling and based on the experience of the Western countries, however, one may present recommendations for newly built dwellings. For instance, an unoccupied land plot might be chosen for a newly built house within the city boundaries or a wasteland plot of 5000 - 10000 m². Such a house could consist of 45 % two-room apartments (50-55 m²), 50 % three-room apartments (70-75 m²) and 5 % four-room apartments (85-90 m²) (Raumordnungsprognose 2010, 1996).

4. DECISION SUPPORT SYSTEM FOR CHOICE OF SUSTAINABLE DWELLING

One of the future tasks of the Lithuanian Dwelling Strategy is to create a uniform dwelling information system (for collection of information and analysis of the dwelling market), because now people have a large amount of scattered information and there is no one place where one could find all the necessary information on this issue. The option of a sustainable dwelling should be selected with respect to micro- and macro-environmental factors, the way of living, the needs of the household and financial opportunities and requirements. The best way to gather, process and assess the information in order to choose the best alternatives of a sustainable dwelling and decide which is the best one is the specialised decision support system for choice of a sustainable dwelling. The authors propose a possible sustainable dwelling model, which is tabled below (see Fig. 3.).

The efficiency of the dwelling market and construction of dwelling real estate depends on different micro- and macro-environmental factors. Macro-environmental factors are the following ones: the public economic, political and cultural level, governmental policy under execution (social dwelling and other programmes, preferential credits, tax concessions, etc.), legal and standard instruments regulating the construction activities, the fluctuation of currency exchange rates, the tax system, the order of lending, interest rates, the insurance system, social policy, inflation, the unemployment rate, qualifications of the labour force,

salary levels, labour laws, protection of environment, habits and traditions, etc. The creation of the legal preconditions for dwelling development is a state's prerogative.

Micro-environmental factors may be the prices of the land plots and houses, activities of the construction societies, etc. Micro-environmental factors depend on macro-level factors (for instance, construction is regulated by different laws, standard documents adopted in the macro-level).

The new values, new forms of living, new expectations, new concepts of rights and duties as well as the new understanding of aesthetic are all factors influencing today's dwelling. People change the available dwelling during their lifetime much more often than they used to do earlier, because a dwelling must meet this changing attitude. Different households or representatives of some specific ways of living make their choice among different dwelling options (rented or own dwelling, house or apartments, etc.) meeting their requirements and needs. So it is purposeful to choose a reasoned dwelling option per every analysed group separately.

Seeking to choose a sustainable, one needs to have comprehensive information, which includes both experience of exploitation of dwellings and analogical options. Data (criteria) are objective (dwelling price, dimensions, year of construction, borrowed means for dwelling purchase or construction, interest rate, thermal and sound insulation of external walls, technical characteristics of engineering systems, hazardous materials and change of its level in the long run) and subjective (aesthetic picture of a dwelling, comfort, environment, neighbours). After complex analysis of the said criteria, one may choose the most sustainable and suitable dwelling, which would meet the needs of inhabitants in the best way. This would be a starting point for designing the most attractive apartments with better layout.

A method of analysis using many criteria (Maliene, V., 2001; Zavadskas E. K. and et, 1999) allows performing a complex analysis of both utility and priority of the objects in respect to each other and the effectiveness of the criteria determining the use of the real estate, importance as well as competitive ability of the analysed objects. So with the help of the said method, one is able to choose the best and most effective dwelling option per every household type with respect to the quantitative, quality, solvency and availability factors. The designers who are searching for the types could use this and options of sustainable dwelling. Municipalities may use such a methodology also during the preparation of the Law of the Republic of Lithuania on Housing, Improving of Opportunities and Conditions of Housing. Comparison of a selected dwelling with the minimal (for instance, with the help of Table below) or actually existing dwelling size standards would allow to identify inadequacies and submit some certain recommendations for designers, legislative authorities, purchasers, etc.

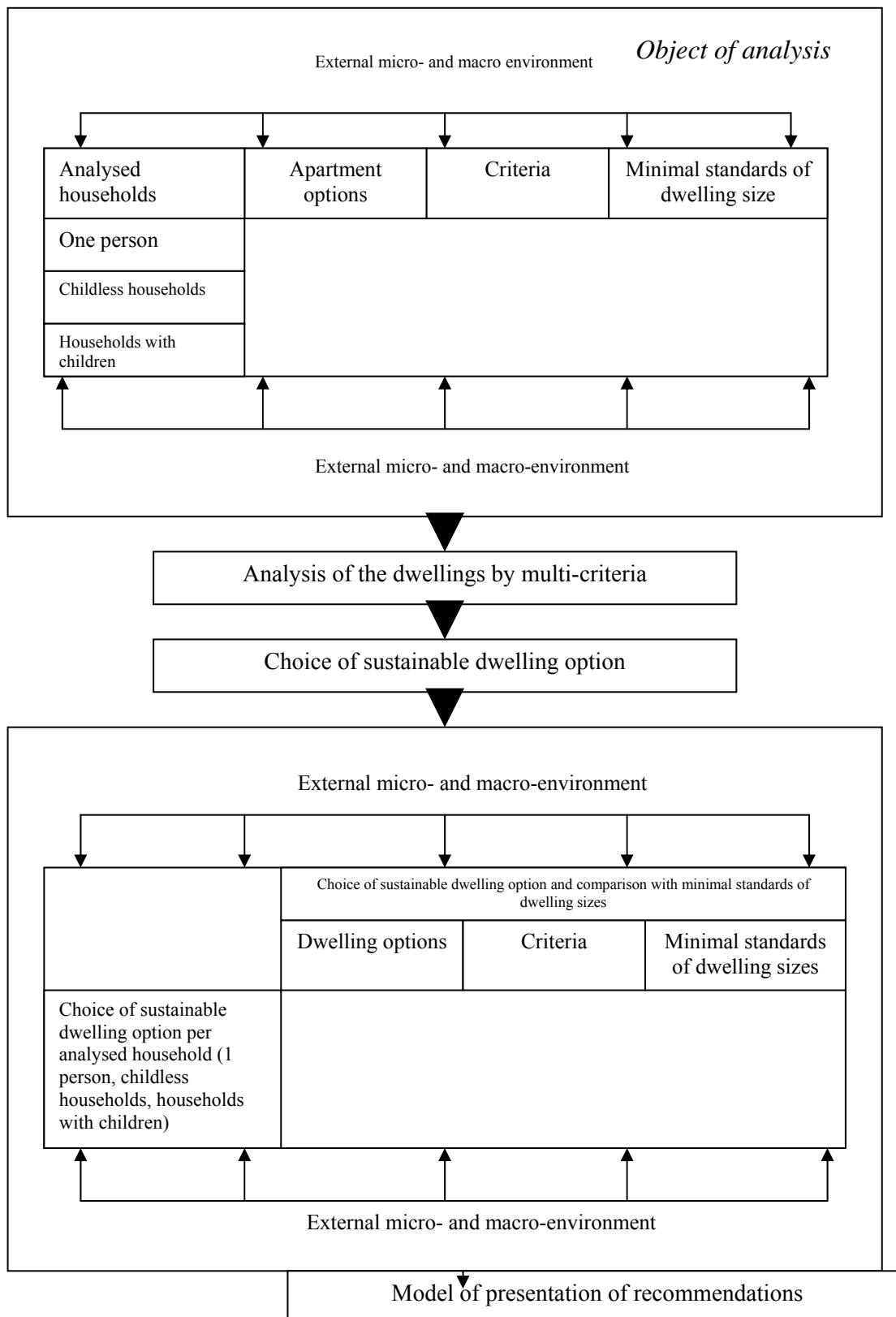


Fig. 3. Decision support system for choice of a sustainable and suitable dwelling

5. POSSIBLE ARCHITECTURAL SOLUTIONS

The problem of own, comfortable and attractive dwelling is relevant throughout all times. Dwelling construction may be divided into one-apartment, two-apartment dwelling houses and blocks of flats.

One-apartment dwelling houses – individual houses, often designed according to special order. Their architecture and layout schemes are different (every time one must adapt to the needs of future house owner). One may notice a tendency that people are subject to construction houses consisting of 5 rooms, with an area of 180-250 m² and a garage for one or two cars. A most reasoned design is a one-storey dwelling house because there is no need of staircase to a penthouse or the first storey. Despite the process of construction of such a house is the same or even exceeds the construction of two-storey house, its advantage is that all premises of a dwelling are located on one level and do not make the movement of its inhabitants difficult inside such house (Ratavičius G., 2001). People are going to choose houses with pitched roofs. Since the external form of one-storey houses with pitched roofs is free, it is much easier to divide and adapt the inner spaces according to the wishes of its inhabitants.

In the City of Vilnius and its suburbs, two-apartment houses are becoming more and more popular. In comparison with one-apartment dwelling houses they have many modern advantages, which are as follows: the land plot is used more effectively because of the common wall joining two one-apartment blocks while a space between blocks is eliminated, a structure may be built on a narrow land plot. Two walls of one house present in the row of blocked dwelling houses are common with neighbouring houses, so the construction, in comparison with two-apartment houses, is even more economical with lower expenses for heating.

Construction of dwelling blocks of flats has become definitely more intensive. Usually there are 2, 3 or 4 apartments on one level of such a house. There are some blocks of flats of a gallery type.

Fast construction is relevant because of material reasons. One of the most popular ways is framework construction (fast construction, planned building structure and a flexible diversity of façade decisions). Construction of a structure does not depend on planning. A free plan allows to form different apartments and lay them out according to separate needs, so an option of flexible reaction is created to every social change both in the designed buildings and in already built ones (Ratavičius G., 2001).

Requirements of inhabitants to their dwelling change on the long run, so one should leave an option to change the inner spaces by re-locating inner partitions and even walls between apartments. One may notice circumstances of a lack of free planning after assessment of the first gross-panel houses. After thirty years they do not meet the requirements of modern living anymore, and it is almost impossible to adapt them to these needs. An opportunity to choose open or closed spaces determines the comfort of one's dwelling.

One may make carefully designed apartments, even smaller ones, comfortable and attractive enough. A smallest dwelling for one person could have a small hall, dwelling area, kitchen and bedroom niches, and minimal sanitary premises with a shower and bath. Its total area could be only 30 m². An apartment for two persons may consist of separate bedroom, living room, small kitchen or kitchen niche, sanitary premises with bathtub. The following foreign standards applied to the smallest dwelling are presented below:

Table. Standards of minimal room area and dwelling size (Daunora Z. J., 1998)

| Countries | Size of rooms m ² | | | | | | |
|-----------|------------------------------|-------------|----------------------------|----------------------------|----------------------------|----------|--------------|
| | Kitchen/ niche | Living room | 1 st bedroom | 2 nd bedroom | 3 rd bedroom | Bathroom | Hall |
| Denmark | 7/- | 18 | | 7 | | | 1,1-1,3 |
| Finland | 7/4 | 15 | 12 | 10 | 7 | | 1,5x1,5 m |
| Iceland | 7/3,6 | 18-20 | 15 | 10 | 7 | | 1,5x1,5 m |
| Norway | | | 10 | | 7 | 4 | 1,3x1,3 m |
| Sweden | 3,2/2,4 | 18-20 | 12 | 10 | 7 | | 1,3x1,3 m |
| Germany | | 20 | 15 | 9 | | | |

The differences reflect the chosen way of living.

Apartments of minimal area are not very attractive to the inhabitants but this is a perfect starting point for designers of the apartments to prepare a better layout and making it more attractive.

6. CONCLUSIONS

- A new understanding of a sustainable dwelling is in the formation process now. The old Soviet way of thinking that a dwelling is purchased once and forever is still alive, so one tries to purchase it as durable as possible. It is quite natural that we still do not have good examples of a new and reasoned dwelling. The purpose of modern times is both to use foreign financial sponsorship for different dwelling programmes and projects and search for options of a sustainable dwelling. During the search for own models, it is worthy to review the experiences of neighbouring countries, develop state-of-the-art and ecological technology, and solve the organisational problems of a dwelling.
- A sustainable dwelling is characterised as available (sufficient offer and information on such offers), quality (from the technical and provision point of view), economical (greater number of households have opportunities to purchase it and cover the exploitation expenses), ecological (energy-saving, etc.), comfortable and cosy (from the social-psychological point of view). It meets the provisions of the Strategy of National Harmonious Development.
- In international literature a sustainable dwelling corresponds to the definition of a “modern dwelling”. A roof above one’s head is not enough. A dwelling is meant for a family

and must ensure cosiness. It means a symbolic social status. So it is purposeful to analyse a dwelling from economical, sociological, psychological and ecological point of views.

- Classic factors have an influence on a dwelling (income, education, dwelling level) as well as style of living, so the options of a sustainable dwelling could be analysed by the separate stages of a “dwelling career” (initial, development, strengthening, stabilisation and senility), or according to the separate groups of ways of living, because their representative understand the importance of own and rented dwellings in a different ways and thus present different requirements for size of premises, comfort, etc.
- One of the tasks of the Lithuanian Dwelling Strategy is the creation of a united dwelling information system. There is a large amount of scattered information on this issue today, but it is not collected in one place. The best way to gather, process and assess the information in order to choose the best alternatives of a sustainable dwelling and decide which the best is one is the specialised decision support system for choice of a sustainable dwelling. This would be of a great help in order to design attractive apartments with improved layout. Municipalities may also use such methodology during preparation of the Law of the Republic of Lithuania on Housing, Improving of Opportunities and Conditions of Housing.
- With the help of a method of dwelling analysis using many criteria, one is able to choose the best and most effective dwelling option per every household type with respect to the quantitative, quality, solvency and availability factors. The designers who are searching for the types could use this as well as for the options of a sustainable dwelling.
- The Lithuanian Dwelling Strategy contains an offer to decrease the quantitative and quality facets of the dwelling market, and for this reason it is possible to create and apply the model of a sustainable dwelling development (maybe adapted to every town separately), such a model would help to answer questions on foreseen dwelling development, opportunities to choose a dwelling and offer of land plots for dwelling construction.

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BIOGRAPHICAL NOTES

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