

# Fuel poverty and perception on housing and environmental quality in a suburban settlement

Energetsko siromaštvo i percepcija o kvalitetu stanovanja i životne sredine u prigradskom naselju

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## Case study: settlement of Kaluđerica

- § Informal, “wild settlement” on the outskirts of Belgrade which is considered the largest completely built illegal settlement in the Balkans, and most probably in Europe
- § After 1967 - Intensive spatial and demographic development, key drivers: 1) population inflow and lack of housing in the city, 2) proximity to the city, 3) absence of the urban planning treatment
- § Population - 26904 inhabitants, 8831 households, 10866 apartments with an average size of 75m<sup>2</sup> (Census 2011)
- § The end of the 1980s - the latest research - survey of the population (B. Saveljić, *Beogradska favela*, 1989)



## Q Questionnaire Survey on Residential Preferences in Kaluđerica

(period: February/March 2014, sample: 90 households)

Key findings:

§ motives for settling in Kaluđerica;

§ satisfaction with different neighbourhood's amenities;

§ variability of suburban residential preferences.

National scientific project TR 36035 "Spatial, Environmental, Energy and Social Aspects of Developing Settlements and Climate Change – Mutual Impacts" / "Prostorni, ekološki, energetska i društveni aspekti razvoja naselja i klimatske promene – međusobni uticaji" / financed by the Serbian Ministry of Education, Science and Technological Development

## Q Questionnaire Survey on Fuel Poverty in Kaluđerica

(period: February 2015, sample: 50 households)

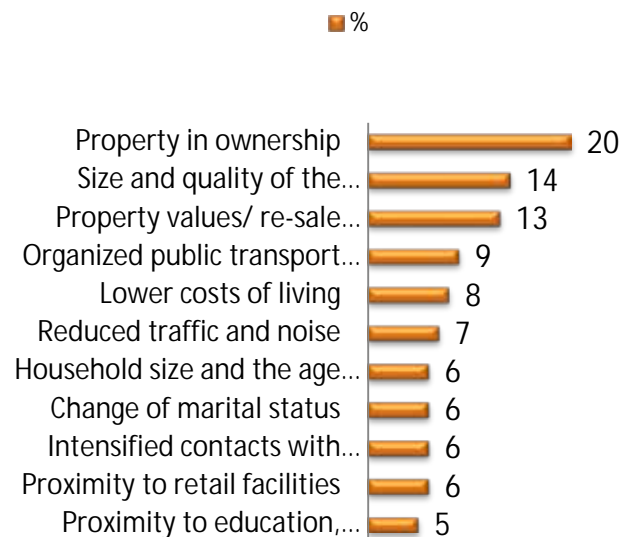
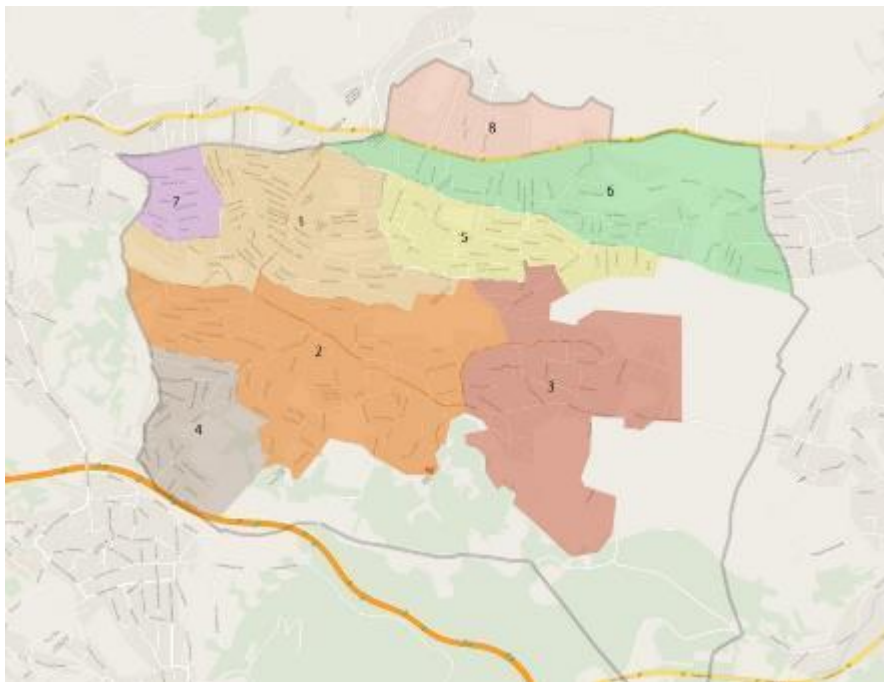
Key findings:

§ average households expenditure on energy;

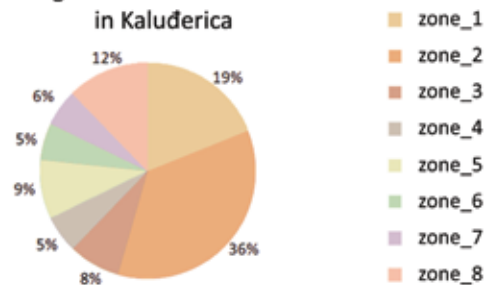
§ general energy characteristics of buildings;

§ perception on thermal comfort.

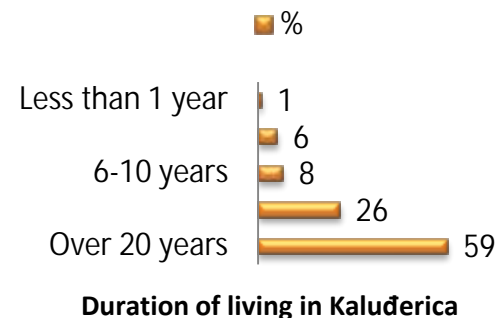
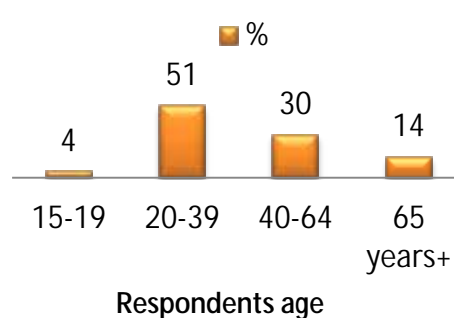
# Study on residential preferences / Motives to settle in Kaluđerica



Origin of the respondents by designated residential zones in Kaluđerica

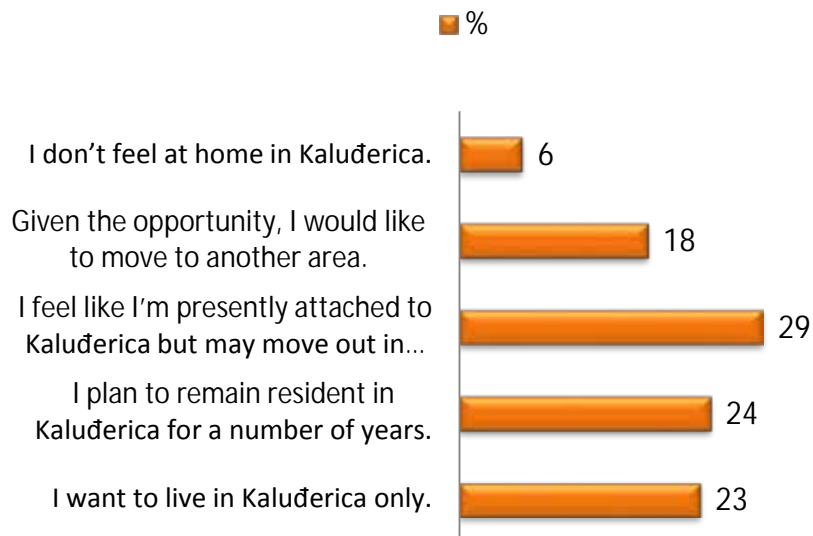


General Profile of Respondents

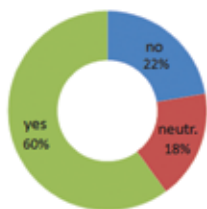


# Attachment to Kaluđerica / Perception on housing and environmental quality

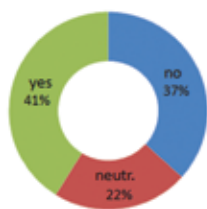
## Attachment to Kaluđerica



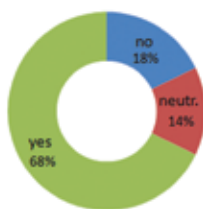
## Percieved qualities (attractions) of Kaluđerica



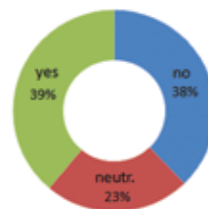
Convenient location of Kaluđerica



Facilities and amenities of Kaluđerica



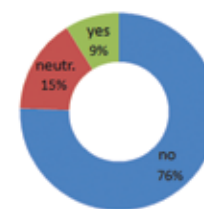
Good neighbours of Kaluđerica



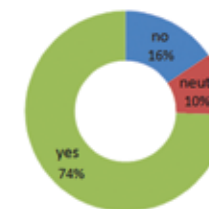
"Village feel" (friendly people) of Kaluđerica



Quietness and safety of Kaluđerica



Environmental quality and level of cleanliness of Kaluđerica



Public transport system of Kaluđerica



# Environmental problems

- q Negative perception on environmental qualities and the level of cleanliness
- q Key pollution issues, noted by respondents are: incomplete and insufficiently developed sewage network in the settlement; the creek of Kaluđerica; inadequate waste disposal (unregulated waste disposal, insufficient containers, burning of waste); polluted air (solid fuel burning in winter); proximity of the landfill in Vinča, etc.



# Fuel poverty challenges in Serbia



- § **Fuel poverty** (FP) (also energy poverty) – globally recognized social and energy problem that is gaining importance with rising energy prices and awareness of the negative effects of climate change;
- § Fuel poor households are those that “are unable to obtain an adequate level of energy services, particularly warmth, for 10% of their income” (Boardman, 1991). Adequate level of wintertime warmth - 21°C in the living room and 18°C in the other occupied rooms (UK Fuel Poverty Strategy 2001);
- § Key FP factors: **1) low household incomes, 2) high fuel prices and 3) poor energy performance of housing stock;**
- § Various operational definitions and indicators of fuel poverty in different countries - from domestic energy consumption (heating, hot water, cooling, lighting, appliances) (British context) to energy consumption in both home and transport (e.g. “energy precarity” in France);

## q Key FP factors in Serbia:

- § high prices of fuel and district heating in relation to household income;
- § undeveloped and inefficient heating systems and a lack of alternative energy sources (making it impossible for households to save energy);
- § a low level of energy efficiency of housing stock;
- q *2013 Survey on Income and Living Conditions in Serbia (EU SILC methodology)*: 18.3% of the respondents live in households unable to keep their home adequately warm, and proximately 37% of households have arrears on their utility bills, which is more than the EU average (<9,9%, for both indicators);
- q *2013 Household Budget Survey in Serbia (Anketa o potrošnji domaćinstava - APD)*: households spend a monthly average of 11.3% of their total disposable income on household energy expenditure (16,7% including transport expenditure).

# Fuel poverty in suburban areas



- q **Greater vulnerability to fuel poverty of rural and suburban populations** (location factors, social factors, dwelling characteristics)

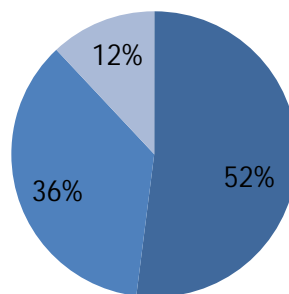
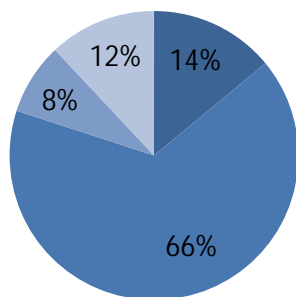
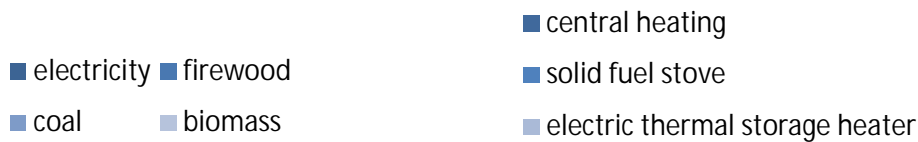
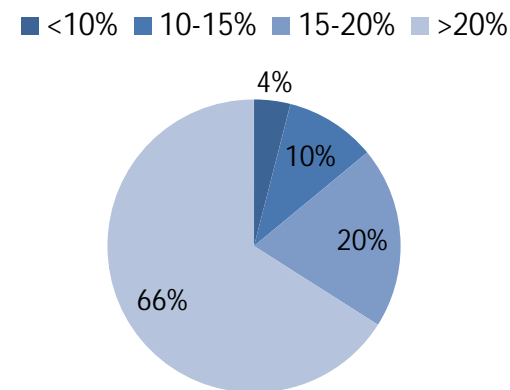
- q *2013 Household Budget Survey in Serbia*: The share of the total household income spent on home energy bills and transport in urban areas makes up approximately 16%, while in other areas it is almost 18% (this difference primarily refers to higher transportation costs)
- q Key FP factors in suburban settlements in Serbia:
  - § Low to moderate income households;
  - § The absence of district heating system;
  - § Higher transportation costs;
  - § Energy inefficient homes (uncompleted houses, lower construction standards, single-family detached houses as a dominating typology)
- q Illegal status of the housing stock – barrier to potential programs of investments in improving EE.



# Evidence from Kaluđerica / Expenditure on energy

- § 86% of the households in Kaluđerica spend over 15% of their total monthly income on household energy and transportation costs; According to the respondents, only 12% of the households have electricity bill arrears;
- § In approximately 2/3 of the households surveyed, the use of solid fuels (wood and coal) is a dominant source of household heating, where firewood is the most represented fuel, used by 66% of the households;
- § The average monthly expenditure on electricity in the households surveyed is 5,800 RSD (cca 48 EUR) per household. 70% of the households use their own cars as a means of transportation and spend on average approximately 10,000 RSD (cca 83 EUR) on fuel.

Share of households, grouped by average expenditure on energy services (as % of the total monthly income)

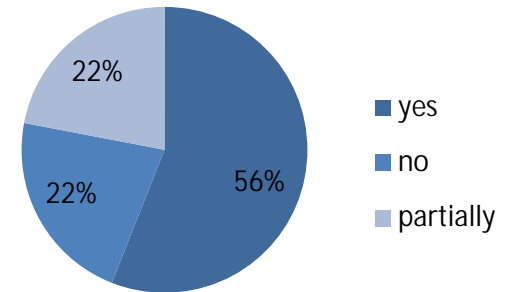


Household heating by primary energy sources and heating systems

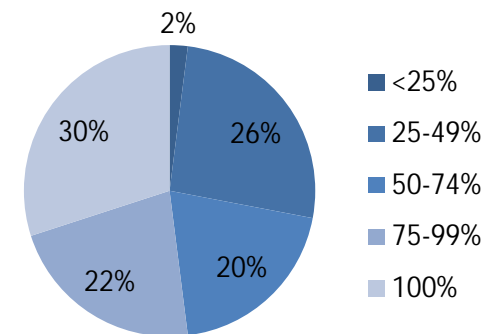
# Energy characteristics of buildings / Thermal comfort

- § Approximately 2/3 of the houses are detached and square-shaped; The majority of the houses have sloping roofs and attics that are in 28% of the cases used for dwelling, while temporary roof structures are recorded in 12% of the houses;
- § The building envelope thermal insulation is complete in 56% of the houses, while houses with partially applied thermal insulation or with no thermal insulation make up 22%; 5cm thick polystyrene was used as thermal insulation in most of the finished facades; only 40% of the houses have floor thermal insulation;
- § Less than 1/3 of the households heat the entire usable area in the heating season. According to the subjective estimates of the respondents, approximately 50% of them were satisfied with air temperatures in their homes during the winter months, 44% of the respondents were only partially satisfied, while 6% of the respondents were not satisfied.

Thermal insulation of facades



Share of households by heated area of dwelling (in %)



# Conclusions

- § Unlike Western countries' sprawl, where suburbanization is stimulated by the affluent population's wish to move out of the city, people of Belgrade suburban neighborhood Kaluđerica were primarily driven by the ability to afford house in private ownership in this area;
- § Attachment of the residents to this area is high, but given the opportunity, more than 60% of respondents would consider to move to the urban part of Belgrade;
- § Despite many infrastructural deficiencies, the quality of life is seen as "better than before" and the key perceived qualities (attractions) of the settlement are public transport system, convenient location of Kaluđerica and good neighbours;
- § Main dissatisfaction with suburban life in Kaluđerica is expressed towards lacks in the level of hygiene and environmental quality;
- § Confirmed assumption of a very pronounced vulnerability to fuel poverty among the residents of Kaluđerica. According to the data obtained, 66% of the households surveyed spend more than 20% of their monthly income on home energy bills and transport (the same indicator in the region with the highest fuel poverty level recorded in Serbia is less than 20%);
- § Key factors of FP in Kaluđerica: high energy prices in relation to disposable income, high expenses for car fuel, inefficient heating system, low level of energy efficiency of residential buildings;
- § Problem of using risky methods of energy saving (reducing the heated space during the heating season and using cheap and low-quality fuels) , with all of their negative effects on health and quality of life.

## More information on research



Conference on Human and Social  
Sciences 2015

Online Archive:  
<http://www.hassacc.com/archive/>

Bajić, T. & Petrić, J. (2015) Fuel Poverty Challenges in Serbia: Evidence from the Suburban Settlement of Kaluđerica. *Proceedings of the 3<sup>rd</sup> HASSACC 2015 - Virtual Conference Human And Social Sciences at the Common Conference*, 5-9 October, 2015, pp. 116-121.

Petrić, J. & Bajić, T. (2015) Variability of Suburban Preference in a Post-socialist Belgrade. *Proceedings of the 3<sup>rd</sup> HASSACC 2015 - Virtual Conference Human And Social Sciences at the Common Conference*, 5-9 October, 2015, pp. 134-139.

# Thank you for your attention!

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