



ИНСТИТУТ ЗА АРХИТЕКТУРУ И УРБАНИЗАМ СРБИЈЕ
INSTITUTE OF ARCHITECTURE AND URBAN & SPATIAL PLANNING OF SERBIA

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RURAL POPULATIONS AND RENEWABLE ENERGY SOURCES

-experiences of the Republic of Serbia-

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topics...

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- **introduction**
 - **sustainable development and renewable energy sources**
 - **application of RES in rural areas**
 - **possibilities of applying RES in rural mountain regions in Serbia**
 - **conclusion**

- 20th century brought new knowledge of resource exploitation (before they were taken for granted, considered inexhaustible)
- occurrence of the greenhouse effect and accumulation of gasses (CO, CH₄) has led to arising trend in examination of RES
- RES have been elaborated in AGENDA 21, HABITAT II and KYOTO protocol
- reduction of emissions of toxic gasses from 2008 to 2012 by 5.2 compared to the level in 1990
- autonomy from large energy systems (main pollutants)
- coordination on the nation level

positive effects



- **ecological** (decreases emissions, reduces health risks)
- **economical** (cheaper than traditional, new jobs)
- **social** (positive psychological effects, local programs for activation of rural population)

- **household energy** (electricity, energy for heating distributed through large centralized systems)
- **energy used for technological processing** (milking, drying fruits, vegetables, medical herbs)





- **government`s support** – through strategies, programs, policies, laws, tax policies, administrative relief
- **coordination and communication** - between the key participants
 - **political and financial resources**
 - **large number of possible scenarios**
- **importance of involving women population in RES promotion and maintenance**



- possibility of **improving the economic status** of rural population
 - possibility of **reducing emigration** to urban centers
 - possibility of **establishing the value of resources** and **securing return of the money** to local economy
 - organizing the **trainings** for locals



- the use of green energy - more efficient when it is applied at a local level
 - governments of under-developed countries have through **Agency for Non Conventional Energy and Rural Technology** introduced local rural communities to RES
 - special part – stimulation the active participation of female population and training for the application in RES
 - India, Bangladesh, Botswana, China, Tibet, Bolivia, Nepal

Serbia`s possibilities...



- poor results
- traditional sources (low calorie coal, wood) distributed through centralized systems
- **PROBLEM: low price of electrical energy and lack of personnel**
 - Serbian energy efficiency strategy recommends the use of hydro energy
- **MAIN POTENTIAL : geothermal energy of Serbia`s spas**



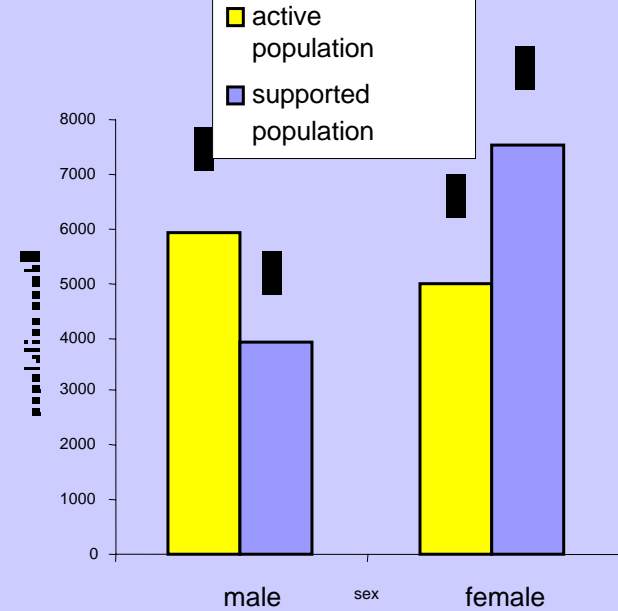
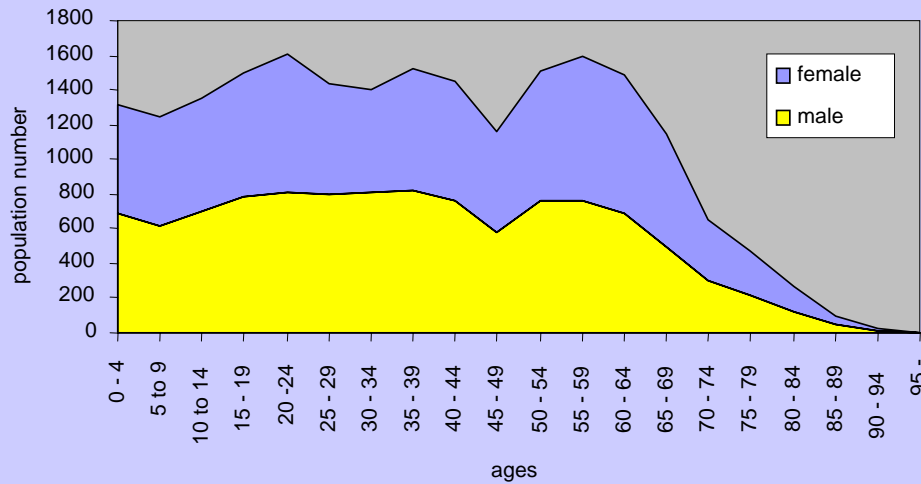
SERBIA

- area **88.361 km²**
 - (**22.000 km²** in mountain regions-half of land registry municipalities above 600m)
- 10 % of entire population lives in mountain rural regions
- all of them are using traditional energy sources
 - **patriarchal way of life in Balkans** – unequal employment opportunities for the both sexes



- RES would replace existing traditional energy sources decreasing the health risks and pulmonary infections amongst children and female population
 - FUTURE: use of geothermal, solar, hydropower plant and wind energy
- education should be based on national strategy-
FOCUS ON WOMEN – responsibilities in households
 - introduction in application principles of RES in households (installation of PVP, use of wind energy, bio gas) for efficient food preparation, maintenance of the equipment

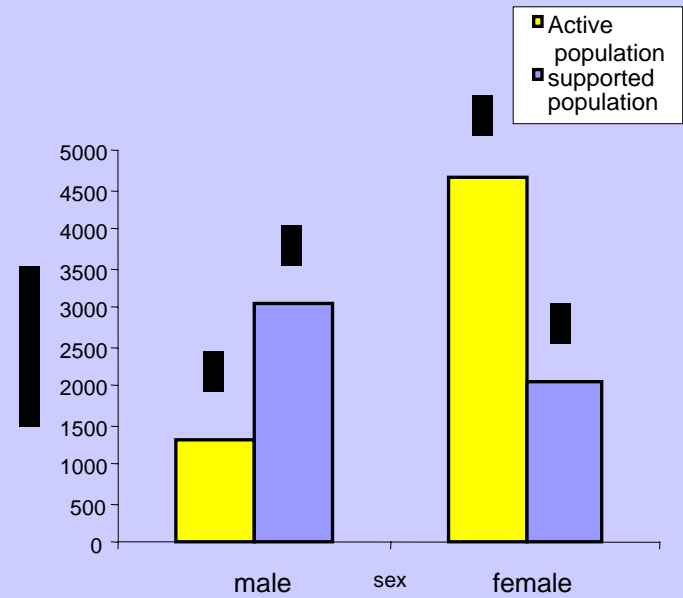
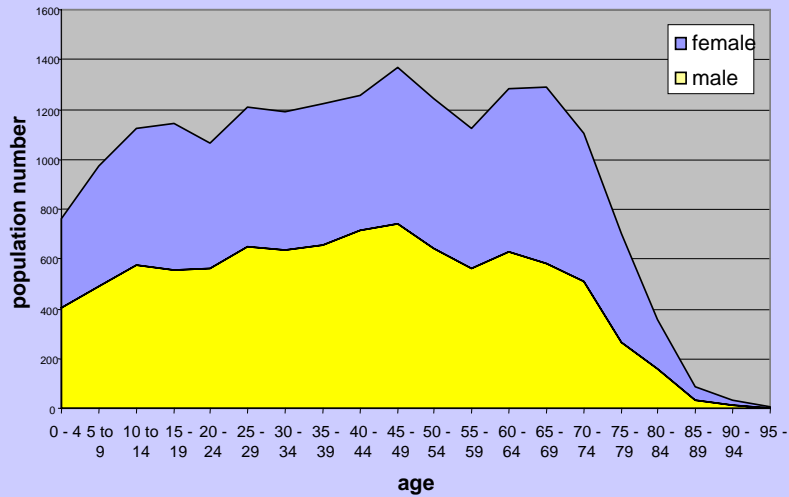
Age and sex demographics in the municipality of Valjevo, according to 2002 Census



VALJEVO

- area 905 km²
- inhabitants 96.771 (census 2002. – depopulation)
 - larger female population in all age groups
- great problem with the number of women fit to work which receive state benefits
 - women work in households and small farms
 - they could work in application of RES

Age and sex demographics in the municipality of Brus, 2002 census

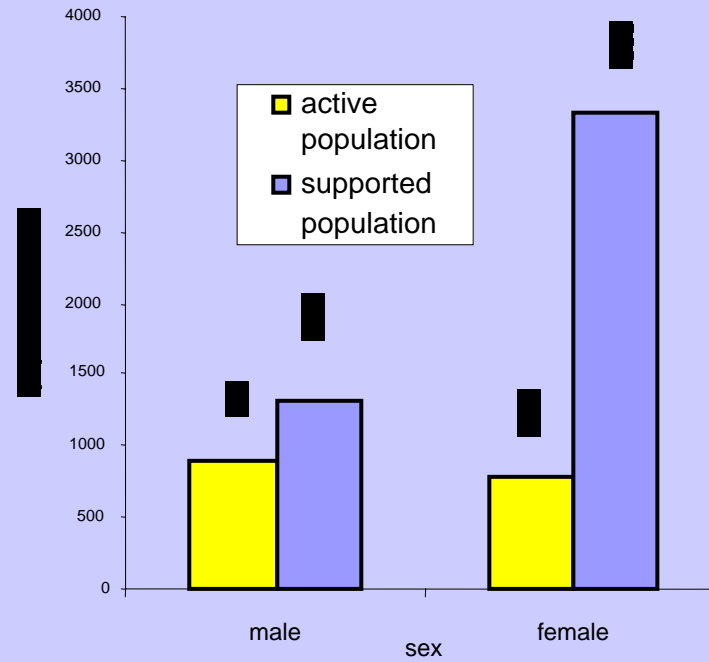
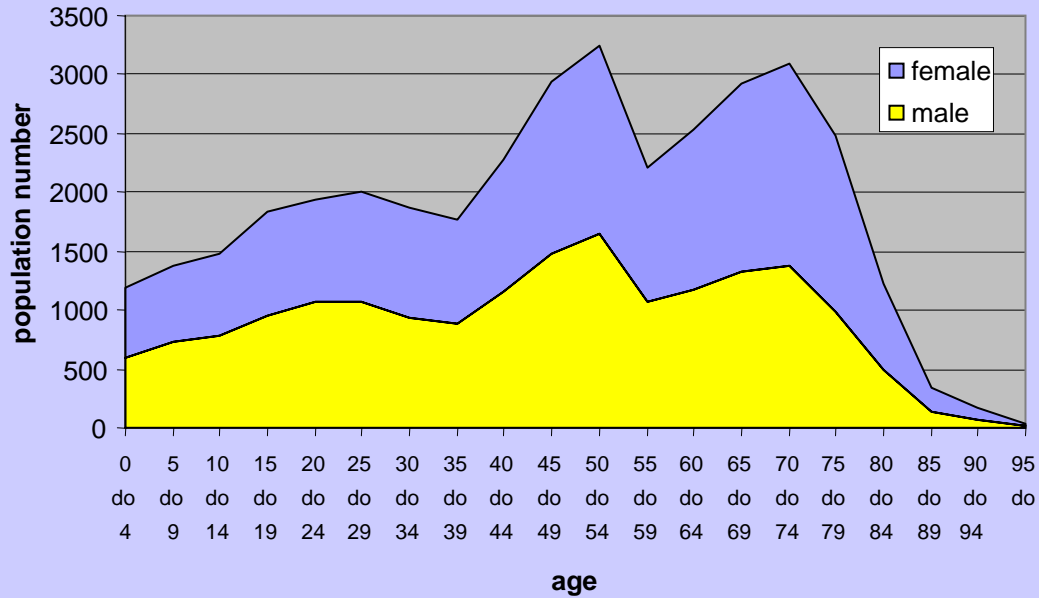


BRUS

• area 606km²

- From 1991. population decreased by 13 %
- sex classification shows that large number of women could be included in RES application with help of different education projects
 - need for stimulating employment
 - active population is mostly male

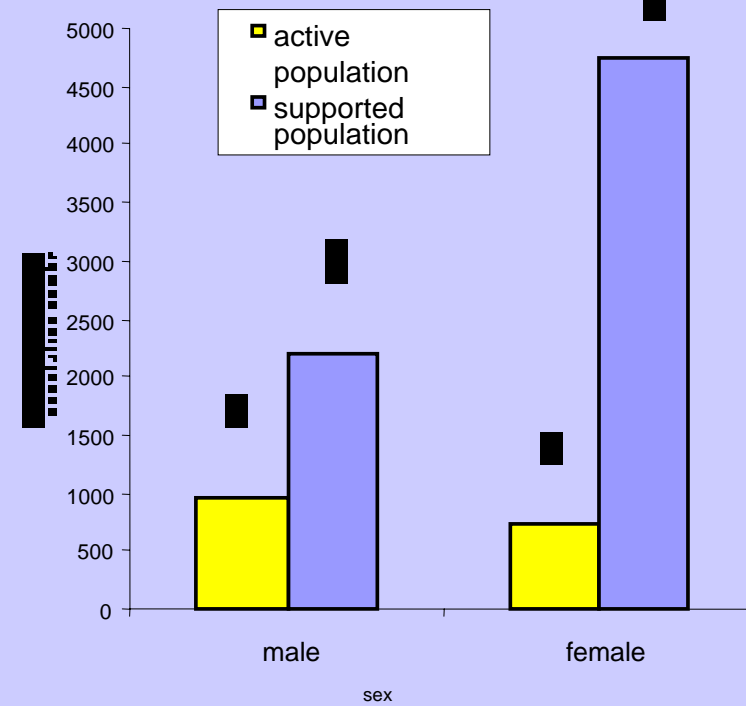
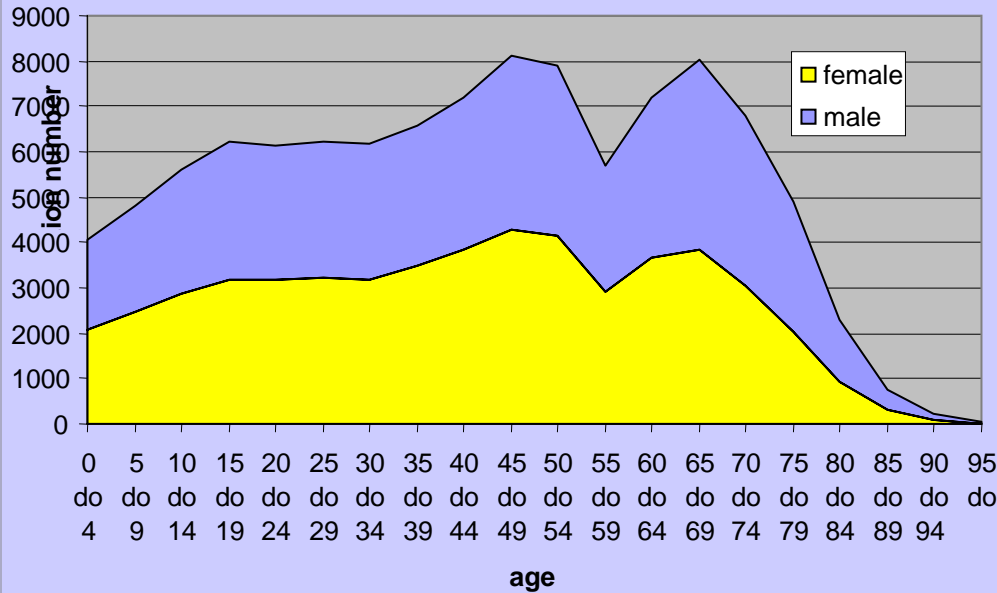
Age and sex demographics in Knjazevac municipality 2002 census



KNJAZEVC

- area 1202km²
- negative age structure with a strong tendency towards depopulation
 - RES application should focus on stimulating dominant elderly female population at a household level

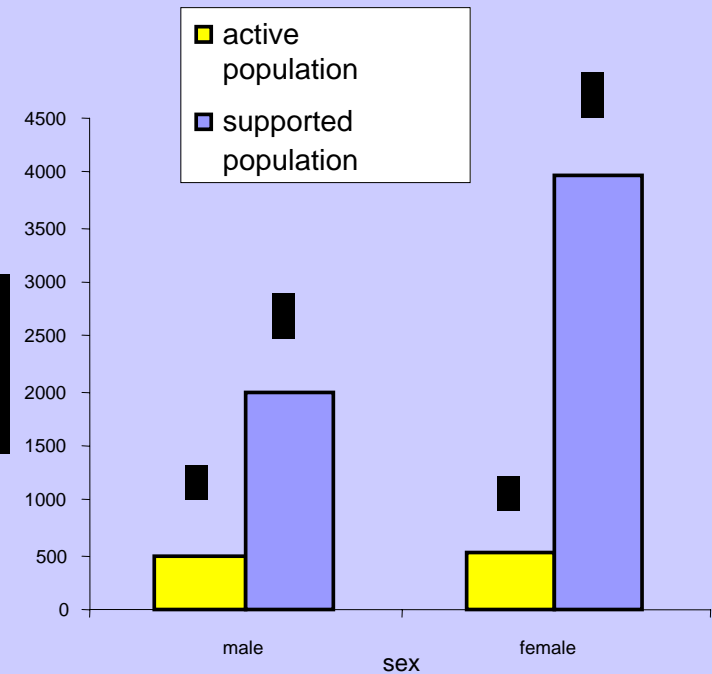
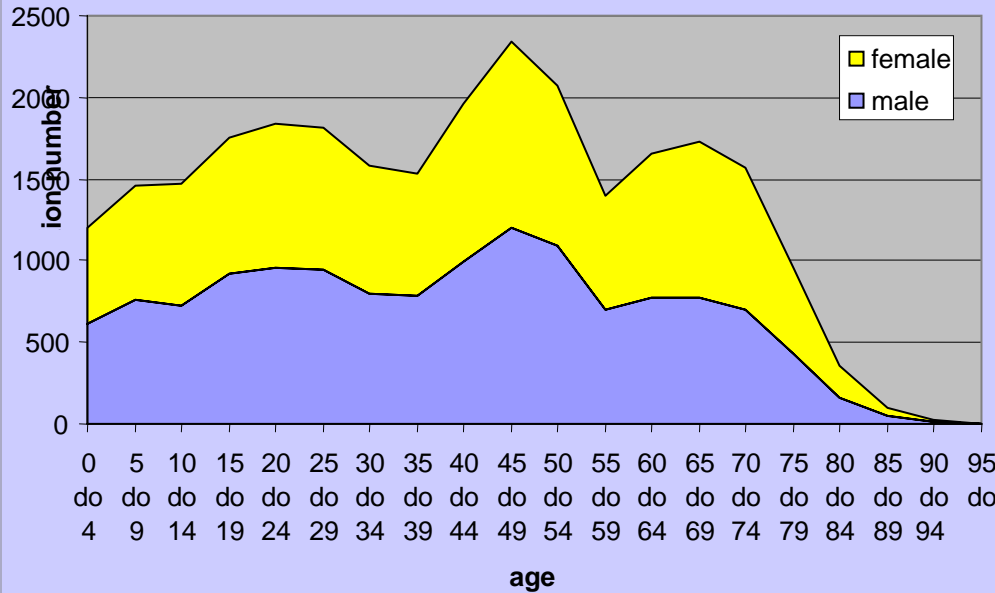
Age and sex demographics in Pirot municipality, census 2002.



PIROT

- area 1232km²
- Best economic structure of all the examined municipalities
- the population working in traditional energy sources should be trained to work in RES
- Sex and age structure are the advantages of this municipality

Age and sex demographics in the municipality of Raska 2002. census



RASKA

- area 666km²
- stagnating tendency which makes this municipality similar to the Valjevo municipality,
 - 24% population works in agriculture
- Supported female population within total active in agriculture is low



- Problem with **relevant statistical information absence** concerning the educational level of the female population in different age groups
 - In undeveloped countries, women are employed in positions **that do not require college** or higher education
- **in Serbia situation is different-** the educational structure is generally **higher than in undeveloped countries-** requirement for university educated personnel in power plants can be met



- only **joint actions of institutions** at local, regional and national levels can create a uniform strategy
 - with the **systematic implementation of RES** it should be expected amazing results in Serbia
 - **positive influence on demographic tendencies** and rural development, **positive ecological implications**, bringing Serbian rural areas **closer to the level of development of their European counterparts**
 - sex and age structures of the rural areas are suitable for implementing RES application programmes.
- results of **scientific research of climatic parameters** implicate that Serbia is ready to apply RES



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