Wallius V., Kunttu J., Hurmekoski E., Hujala T., Nyrud A.Q., Hoen H.F. (2024). Attractiveness of wood-frame multi-storey buildings in seven European countries: consumer segmentation and the effect of fire safety information. Silva Fennica vol. 58 no. 5 article id 23035. https://doi.org/10.14214/sf.23035

# Supplementary file S1: Survey questions.

QCOUNTRY.

- 1. UK
- 2. Norway
- 3. Finland
- 4. Sweden
- 5. Denmark
- 6. Germany
- 7. Austria

# QDEMO3. Your age

Q1. How well do the following statements fit you?

- 1. I have savings and investments to increase my financial security
- 2. I believe current climate variation and change is mainly due to natural processes
- 3. I have reduced my meat consumption on ethical and environmental reasons
- 4. I'm determined to diminish my climate footprint
- 5. I think buying and owning an apartment or house is an important investment
- 6. I know how to diminish by climate footprint

[Numeric matrix – 9-point Likert-SCALE Don't fit (1) – Fit very well (9)]:

INFORMATION We want you to consider three different groups of products based on raw material from forests, namely a) houses and buildings, b) bioenergy and c) packaging, paper and other processed products.

Q3A. Indicate how much you agree with the following statements regarding houses and buildings CONSTRUCTED FROM WOOD

- 1. Using wood harvested from forests, they destroy important habitats for rare and endangered species
- 2. Using a renewable, natural resource, and storing carbon, they contribute significantly to creating a sustainable and climate-friendly society
- 3. Using wood harvested from forests, they contribute significantly to deforestation and emissions of greenhouse gases

[Numeric matrix – 9-point Likert-SCALE Don't agree (1) - Completely agree (9) + Don't know (10)]:

Q3B. Indicate how much you agree with the following statements regarding wood for BIOENERGY

# **RANDOMIZE**

- 1. Using wood harvested from forests, bioenergy destroy important habitats for rare and endangered species
- 2. Using a renewable, natural resource, bioenergy contribute significantly to creating a sustainable and climate-friendly society
- 3. Using wood harvested from forests, bioenergy contribute significantly to deforestation and emissions of greenhouse gases

[Numeric matrix – 9-point Likert-SCALE Don't agree (1) - Completely agree (9) + Don't know (10)]:

Q3C. Indicate how much you agree with the following statements regarding forest products such as packaging, paper, hygiene paper, textiles, bioplastics, composite materials and chemicals MADE FROM WOOD

# **RANDOMIZE**

- 1. Using wood harvested from forests, these products destroy important habitats for rare and endangered species
- 2. Using a renewable, natural resource, these products contribute significantly to creating a sustainable and climate-friendly society
- 3. Using wood harvested from forests, these products contribute significantly to deforestation and emissions of greenhouse gases

[Numeric matrix – 9-point Likert-SCALE Don't agree (1) - completely agree (9) + Don't know (10)]:

Q4. Do you own or rent the home (house or apartment) you live in?

# SINGLE ANSWER

- 1. Owning
- 2. Renting
- 3. Other (e.g. living with family or friends, housing paid by employer, ...)

Q7. I have lived most of my life in...

# SINGLE ANSWER

- 1. The capital region or a metropolitan area (> 1 million inhabitants)
- 2. In a large city (100 000 1 000 000 inhabitants)
- 3. In a small or medium sized city (10 000 100 000 inhabitants)
- 4. In a village (< 10 000 inhabitants)
- 5. In the countryside
- Q9. What type home do you live in?

### SINGLE ANSWER

- 1. Detached, single-family house
- 2. Semi-detached house
- 3. Townhouse/Row house

- 4. Apartment-building (1-2 storeys (floors))
- 5. Apartment in a multi-storey building (minimum 3 storeys (floors))
- 6. Other

Q10A. If I could choose freely, I would prefer the structural (load-bearing) material in the building I live in to be...

# SINGLE ANSWER

- 1. primarily wood
- 2. wood in combination with other materials
- 3. other materials than wood (e.g. brick, concrete, steel)
- 4. I do not know/remember

Q10b. What is the structural (load-bearing) material in the building you live in?

#### SINGLE ANSWER

- 1. Primarily wood
- 2. Wood in combination with other materials
- 3. Other materials than wood (e.g. brick, concrete, steel)
- 4. I do not know/remember

INFORMATION We define a multi-storey building as any building with a minimum of three storeys (floors).

Q11. I have experience from living or from working in a multi-storey building

#### SINGLE ANSWER

- 1. Yes
- 2. No

Q11A. [IF CODE 1 IN Q11] Please specify the total number of years you have lived or worked in a multistorey building

# [NUMERICAL, RANGE 0-99] [NEXT Q11B]

Q11B. A load bearing structure has the components of a building (commonly walls, columns, beams) which carries and transfers the load to the ground safely. This structure guarantee stability of the building and its performance.

What kind of load-bearing construction was in the multi-storey building(s) you have experience from?

# MULTI ANSWER ALTERNATIVES 1 – 3 // ALTERNATIVE 4 SINGLE ANSWER

- 1. Concrete&steel
- 2. Wood frame
- 3. Other
- 4. Don't know

# Q14A. INFORMATION

We want you to consider some relevant aspects and factors related to the place you live and how important they are for you. We have listed 7 such factors.

We ask you to rank them, 1 indicating the most important factor or attribute and 2 to the second most important and so forth. You may set zero to factors that are of no importance for you.

#### **RANDOMIZE**

# RANKING [NUMERICAL, RANGE 1-7 + 0]

- 1. The ["IF CODE 1 AT Q4 DISPLAY "purchase price" or IF CODE 2 AT Q4 DISPLAY "rental cost" or IF CODE 3 AT Q4 DISPLAY "cost"]
- 2. The option to [IF CODE 1 AT Q4 DISPLAY "own rather than rent" // IF CODE 2 AT Q4 DISPLAY "rent rather than own" // IF CODE 3 AT Q4 DISPLAY "neither to own nor rent"]
- 3. Location and neighbourhood
- 4. The house or apartment in itself
- 5. Environmental and sustainability aspects related to the building
- 6. Construction and material attributes
- 7. Building materials fit with local/regional typical modes

Q14B. We want you to indicate the importance of certain aspects or factors related to the place you live. For the location and neighbourhood of your home, indicate the importance of:

#### **RANDOMIZE**

- 1. Nice view from the area
- 2. Short distance to city centre (shops and other services)
- 3. Short distance to day-care
- 4. Short distance to schools
- 5. Short distance to leisure facilities (sports parks/training centre/pool etc)
- 6. Short distance to family or friends
- 7. Short distance to recreational areas: parks/forests/water
- 8. Located in an attractive community with a good reputation

[Numeric matrix 9-point Likert SCALE Not important (1) – Very important (9) + Don't know (10)]

Q14C. For the house or apartment in itself, indicate the importance of:

### **RANDOMIZE**

- 1. Nice view from the house or apartment
- 2. The amount of natural light indoors
- 3. Functional floorplan
- 4. Newly built
- 5. Recently renovated
- 6. Design and visual appeal of the building (architecture)

[Numeric matrix 9-point Likert SCALE Not important (1) – Very important (9) + Don't know (10)]

Q14D. For environmental and sustainability aspects related to the building you live, indicate the importance of:

### **RANDOMIZE**

- 1. The building consists mainly of renewable materials (construction, interior, exterior)
- 2. The building has a low carbon footprint in construction
- 3. The building has a low carbon footprint in use
- 4. The building is well insulated and use little energy for heating or air-conditioning
- 5. Recyclability at end-of-lifetime of building

[Numeric matrix 9-point Likert SCALE Not important – Very important + Don't know (10)]

Q14E. For construction and material attributes related to the building you live, indicate the importance of:

#### **RANDOMIZE**

- 1. Solidity and durability
- 2. Maintenance (frequencies and costs)
- 3. Fire safety/Vulnerability to fire
- 4. Insulation regarding sound
- 5. Healthy indoor environment (e.g. air quality)
- 6. Materials used in load-bearing construction (non-visible materials)
- 7. Indoor visible materials (floors, walls and ceilings)
- 8. Outdoor visible materials (outdoor cladding)

[Numeric matrix 9-point Likert SCALE Not important (1)—Very important (9) + Don't know (10)]

Q15. "How do you perceive wood as a construction material? Describe with 2-3 sentences."

# **OPEN ENDED**

INFORMATION. With a multi-storey WOOD BUILDING, we mean an apartment or office building of three storeys (floors) or more with a load-bearing construction made primarily of wood. Here are some pictures of multi-storey wood buildings.

# THREE PICTURES TO BE SHOWN

Q16. Which of the following statements describes your level of knowledge regarding multi-storey wood buildings? Several answers is possible.

# **MULTI ANSWER**

- 1. I have never heard of them.
- 2. I have heard some discussions or read about them from a media (newspaper, internet, trade journal, radio/TV, social media).
- 3. I am interested in the subject and know something about it.
- 4. I am familiar with them through my studies/work.
- 5. I have visited a multi-storey wood building built in the 2000's.
- 6. I have lived in a multi-storey wood building built in the 2000's.

- Q18. How attractive would it be for you to live in an apartment in a multi-storey wood building? [Numeric 9-point Likert SCALE Not attractive (1) Very attractive (9) + Don't know (10)]
- Q19. Please rank the following factors or attributes for importance in deciding your response to the previous question regarding how attractive it would be for you to live in an apartment in a multi-storey wood building. Rank the alternatives, giving 1 to the most important factor or attribute and 2 to second most important and so forth. You may set zero to factors that are of no importance.

# [RANKING NUMERICAL, RANGE 1-9 + 0]

- 1. Solidity and durability
- 2. Maintenance (frequencies and costs)
- 3. Vulnerability to moisture (decay and moulding)
- 4. Fire safety/Vulnerability to fire
- 5. Insulation regarding sound / Soundproofing
- 6. Healthy indoor environment (e.g. air quality)
- 7. Materials used in load-bearing construction (non-visible materials)
- 8. Indoor visible materials (floors, walls and ceilings)
- 9. Outdoor visible materials (outdoor cladding)

### **INFORMATION**

Please read this text carefully before continuing.

Many building regulations and standards have traditionally restricted the use of wood as a building material in multi-storey buildings due to its combustibility. Several research projects and extensive testing conducted over the past few decades worldwide have provided improved knowledge of fire design in wood structures and on safe use of wood in multi-storey buildings.

Technical measures, such as sprinkler systems and well-equipped fire services, have additionally supported increased wood usage. As a result, many countries have revised fire regulations to permit the greater use of wood. Most European countries, such as Sweden, Germany, UK, Norway, Denmark, Finland and Austria, now have no specific regulations limiting the number of storeys/floors in wooden buildings, provided that functional criteria and required fire-preventing measures are fulfilled.

We now repeat some of the questions related to multi-storey wood buildings and you may reconsider the answers you gave.

Q22. How attractive would it be for you to live in an apartment in a multi-storey wood building?

[9-point Likert SCALE Not attractive (1) – Very attractive (9) + Don't know (10)]

Q23. Please rank the following factors or attributes for importance in deciding your response to the previous question regarding how attractive it would be for you to live in an apartment in a multi-storey wood building. Rank the alternatives, giving 1 to the most important factor or attribute and 2 to second most important and so forth. You may set zero to factors that are of no importance.

# [RANKING NUMERICAL, RANGE 1-9 + 0]

1. Solidity and durability

- 2. Maintenance (frequencies and costs)
- 3. Vulnerability to moisture (decay and rot destroying the wood)
- 4. Fire safety/Vulnerability to fire
- 5. Insulation regarding sound / Soundproofing
- 6. Healthy indoor environment (e.g. air quality)
- 7. Materials used in load-bearing construction (non-visible materials)
- 8. Indoor visible materials (floors, walls and ceilings)
- 9. Outdoor visible materials (outdoor cladding)

Q25. Do you have, or have you ever had, a job (work) connected to the forest-based, the building or the real estate sector?

#### SINGLE ANSWER

- 1. Yes
- 2. No

QDEMO1. Please choose the alternative which best describes your level of knowledge on wood construction

# SINGLE ANSWER

- 1. I have deep interest in and knowledge of, wood construction
- 2. I find wood construction interesting, but have limited knowledge
- 3. I neither have interest nor any knowledge in, wood construction
- 4. I don't know

QDEMO2. For daily and regular transport, e.g. between home and work/school, I use:

# SINGLE ANSWER

- 1. Own car or motor-vehicle
- 2. Walking or biking
- 3. Public transport (e.g. bus, tram, train)

QDEMO5. What is your current civil status?

#### SINGLE ANSWER

- 1. Married
- 2. Cohabitant
- 3. Unmarried / Never been married
- 4. Formerly married / Separated / Divorced
- 5. Widow / Widower

QDEMO6. Size of your household including yourself

# SINGLE ANSWER

- 1. 1-person household
- 2. 2-person household

- 3. 3-person household
- 4. 4-person household
- 5. 5 or more persons

QDEMO7. Number of children aged 0 – 17 years living in your household

### SINGLE ANSWER

- 1. 1 child
- 2. 2 children
- 3. 3 children
- 4. 4 or more children
- 5. No children aged 0 17 in the household

QDEMO8. Education level / Number of years education

### SINGLE ANSWER

- 1. Primary education (up to 10 years)
- 2. Secondary education (primary + 3 years)
- 3. University degree, Bachelor (secondary + 3-4 years)
- 4. University degree, Master (secondary + 5-6 years)
- 5. University doctoral degree (Master + 3-4 years)

QDEMO9. Your household annual income before tax?

# SINGLE ANSWER

- 1. £0-£4999
- 2. £5000 £9999
- 3. £ 10.000 £ 14.999
- 4. £ 15.000 £ 19.999
- 5. £ 20.000 £ 29.999
- 6. £ 30.000 £ 39.999
- 7. £ 40.000 £ 49.999
- 8. £ 50.000 £ 59.999
- 9. £ 60.000 £ 69.999
- 10. £ 70.000 £ 79.999
- 11. £ 80.000 £ 99.999
- 12. £ 100.000 £ 149.999
- 13. £ 150.000 £ 200.000
- 14. More than £ 200.000
- 15. Do not want to answer

QDEMO10. Please indicate type of current residence, type of living environment;

### SINGLE ANSWER

- 1. The capital region or a metropolitan area (> 1 million inhabitants)
- 2. In a large city (100 000 1 000 000 inhabitants)

- 3. In a small or medium sized city (10 000 100 000 inhabitants)
- 4. In a village (< 10 000 inhabitants)
- 5. In the countryside