A holistic framework for decision making in renovation and reconstruction projects using life cycle sustainability assessment

A Data Management Plan created using DMPonline.be

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Project abstract:

The choice between renovation and reconstruction has gained increasing interest in recent years but still remains a primarily unexplored field of inquiry. Currently, building renovation strategies mainly consider an improvement in energy performance that may omit substantial impacts related to the production-construction phases resulting in a possible overestimation of the potential benefits of the renovation itself and a disregard for the possibility of reconstruction. In addition, most current research is often limited to economic and environmental indicators, often neglecting social aspects. Assessing the potential for renovation or reconstruction can solve these drawbacks by including indicators that encompass the triple bottom line of sustainability. Therefore, the goal of this PhD is to develop a holistic framework assessing the potential for renovation or reconstruction of social housing buildings, including key environmental, economic, and social aspects, tackling four major challenges: (1) identifying the main factors influencing the decision on renovation versus reconstruction, (2) selecting adequate sustainability indicators, (3) defining an assessment to inform decision-making in the preliminary stages of projects, and (4) demonstrating the implementation of the holistic framework to support decision makers in the optimal selection of renovation versus reconstruction.

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DPIA

DPIA

Have you performed a DPIA for the personal data processing activities for this project?

- Not applicable

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GDPR

GDPR

Have you registered personal data processing activities for this project?

- Yes

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Application DMP

Questionnaire

Describe the datatypes (surveys, sequences, manuscripts, objects …) the research will collect and/or generate and /or (re)use. (use up to 700 characters)

I will handle both primary and background data, adhering to ethical standards. Within the framework of implementing Life Cycle Sustainability Assessment (LCSA) methodologies in social housing projects, data manipulation will be approached from a comprehensive perspective. This involves addressing information, such as personal or identifiable data concerning participants or organizations (i.e., data limited to name, surname, work position, name of organization, contact). Robust measures will be implemented to safeguard the privacy and confidentiality of such data. The data categories encompass:

- Surveys, Reports & Consent webform data
- Handwritten and digital notes
- Pictures, Screen capture, Audio Recording files
- BIM/CAD files & Simulation data
- Sustainability inventory data

The estimated total volume of data is <1TB.

Specify in which way the following provisions are in place in order to preserve the data during and at least 5 years after the end of the research? Motivate your answer. (use up to 700 characters)

1. Designated responsible person: Prof. Chiara Piccardo, supervisor.
2. Storage capacity/repository
    - During the research: OneDrive for Business, offering 2TB storage for both staff and students, facilitates extensive collaboration opportunities within and beyond the confines of KU Leuven. Accessible through web browsers and a multifactor sync application, it presents a viable solution for storing sensitive data, provided appropriate precautions are implemented.
    - After the research: KU Leuven Research Data Repository (RDR) boasts significant storage capacity, accommodating large datasets while offering customizable accessibility settings. Compliant with KU Leuven's requirement to retain data for a minimum of ten years, RDR adheres to the FAIR principles for data sharing and assigns digital object identifiers (DOIs) to uploaded data, ensuring easy citation and accessibility.

What’s the reason why you wish to deviate from the principle of preservation of data and of the minimum preservation term of 5 years? (max. 700 characters)

Not applicable.

Are there issues concerning research data indicated in the ethics questionnaire of this application form? Which specific security measures do those data require? (use up to 700 characters)

Not applicable.

Which other issues related to the data management are relevant to mention? (use up to 700 characters)

Not applicable.

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FWO DMP (Flemish Standard DMP)

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1. Research Data Summary

List and describe all datasets or research materials that you plan to generate/collect or reuse during your research project. For each dataset or data type (observational, experimental etc.), provide a short name & description (sufficient for yourself to know what data it is about), indicate whether the data are newly generated/collected or reused, digital or physical, also indicate the type of the data (the kind of content), its technical format (file extension), and an estimate of the upper limit of the volume of the data.

				Only for digital data	Only for digital data	Only for digital data	Only for physical data
Dataset Name	Description	New or reused	Digital or Physical	Digital Data Type	Digital Data format	Digital data volume (MB/GB/TB)	Physical volume
		Please choose from the following options: • Generate new data • Reuse existing data	*Please choose from the following options:* • Digital • Physical	*Please choose from the following options:* • Observational • Experimental • Compiled/aggregated data • Simulation data • Software • Other • NA	*Please choose from the following options:* • .por, .xml, .tab, .csv,.pdf, .txt, .rtf, .dwg, .gml, … • NA	*Please choose from the following options:* • <100MB • <1GB • <100GB • <1TB • <5TB • <10TB • <50TB • >50TB • NA	
Research Activities - Analysis	Surveys, Reports & Consent webform data	Generate new data	Digital	Observational	.xml, .csv,.doc, .pdf, .txt	<100MB	
Research Activities - Written Files	Handwritten and digital notes	Generate new data	Digital & Physical	Observational & Compiled/aggregated data	pdf, .txt,.doc	<100MB	
Research Activities - Multimedia	Pictures, Screen capture, Audio Recording files	Generate new data & Reuse existing data	Digital	Observational & Compiled/aggregated data	.psd, .ai, .id, .pdf, .jpeg, .png, .mpeg-4	<50GB	
Research Activities - Modeling	BIM/CAD files & Simulation data	Generate new data & Reuse existing data	Digital	Compiled/aggregated data, Simulation data & Software	BIM files - .ifc, .xml, .rvt, .dwg, .dxf, .ifc shapefiles, .skp; Grasshopper .gh VPL files, energy plus files .osm, and GIS .gdb, .shp	<100GB	
Research Activities - Modeling	Sustainability inventory data	Generate new data & Reuse existing data	Digital	Compiled/aggregated data, Simulation data & Software	.csv, .EcoSpold1, .ILCD, .txt, .xml	<100GB	

If you reuse existing data, please specify the source, preferably by using a persistent identifier (e.g. DOI, Handle, URL etc.) per dataset or data type:

The research employs case studies sourced from Flemish social housing companies, with letters of support included in the original grant application (e.g., Thuispunt Gent). In Research Activities - Analysis all personal data are new and collected during the survey. The focus of the data collection here is related to information regarding the buildings and expertise of participants, as the research does not use personal data beyond organization and name to identify survey participants.
Additionally, the study utilizes background inventory data extracted from reputable sources such as Ecoinvent and other reliable scientific sources. All reused data is either derived from databases (e.g., sustainability inventory data) or participating stakeholders (e.g, drawings, bill of materials).

Are there any ethical issues concerning the creation and/or use of the data (e.g. experiments on humans or animals, dual use)? Describe these issues in the comment section. Please refer to specific datasets or data types when appropriate.

- Yes, human subject data

To ensure that the research adheres to formal ethical standards, it will undergo evaluation by SMEC to assess its compliance with ethical requirements. Upon submission, the application number and anticipated acceptance will be integrated into the intermediate data management plan. It is worth note that we anticipate no ethical concerns since the only personal data processed pertains to general information about the survey respondents (e.g., name, job title, company, etc.).

Will you process personal data? If so, briefly describe the kind of personal data you will use in the comment section. Please refer to specific datasets or data types when appropriate.

- Yes

The personal data utilized is entirely original and sourced directly from the survey administered to stakeholders. This data is confined to basic information like name, occupation, workplace, and other general respondent details.

Does your work have potential for commercial valorization (e.g. tech transfer, for example spin-offs, commercial exploitation, …)? If so, please comment per dataset or data type where appropriate.

- No

Do existing 3rd party agreements restrict exploitation or dissemination of the data you (re)use (e.g. Material/Data transfer agreements/ research collaboration agreements)? If so, please explain in the comment section to what data they relate and what restrictions are in place.

- No

Are there any other legal issues, such as intellectual property rights and ownership, to be managed related to the data you (re)use? If so, please explain in the comment section to what data they relate and which restrictions will be asserted.

- No

2. Documentation and Metadata

Clearly describe what approach will be followed to capture the accompanying information necessary to keep data understandable and usable, for yourself and others, now and in the future (e.g., in terms of documentation levels and types required, procedures used, Electronic Lab Notebooks, README.txt files, Codebook.tsv etc. where this information is recorded).

Datasets:

- Research Activities - Analysis
- Research Activities - Written files
- Research Activities - Multimedia

For all three above datasets, a README.txt file will be created containing: the methodology used to collect data; the definition of relevant variables/information; encrypted information for data manipulation; license agreements that might apply.

- Research Activities - Modeling
- Research Activities - Computation

For the two datasets above, a README.txt will be created containing info on methods applied and structure of the folders. Moreover, a special document will be created to describe the database structure containing also a 'how-to' description of inventory process.

Will a metadata standard be used to make it easier to find and reuse the data? If so, please specify (where appropriate per dataset or data type) which metadata standard will be used. If not, please specify (where appropriate per dataset or data type) which metadata will be created to make the data easier to find and reuse.

- No

3. Data storage & back-up during the research project

Where will the data be stored?

- During the research: OneDrive for Business, offering 2TB storage for both staff and students, facilitates extensive collaboration opportunities within and beyond the confines of KU Leuven. Accessible through web browsers and a multifactor sync application, it presents a viable solution for storing sensitive data, provided appropriate precautions are implemented.
- After the research: All digitally generated data will be archived for at least 10 years following the conclusion of the study, consistent with KU Leuven's Research Data Management (RDM) policy. Data stored on OneDrive will remain accessible and overseen by my supervisor. Additionally, data generated through open access publications will be made available via the KU Leuven Repository (RDR) after publications are completed. Any confidential personal data will not be included in RDR.

How will the data be backed up?

- OneDrive for Business offers automatic backups, supplemented by periodic backups of crucial files on an external hard drive.
- Physical data and documentation will be meticulously organized in labeled folders within KU Leuven's office cabinet, with digital copies integrated into relevant dataset folders whenever feasible.
- The KU Leuven Repository (RDR), utilized upon completion of the research, will be managed by KU Leuven's ICT support and overseen by Professor Chiara Piccardo, my research supervisor.

Is there currently sufficient storage & backup capacity during the project? If yes, specify concisely.
If no or insufficient storage or backup capacities are available, then explain how this will be taken care of.

- Yes

The OneDrive cloud storage already offers 2TB of space, which is more than enough when compared to the estimated total amount of volume for the research.

How will you ensure that the data are securely stored and not accessed or modified by unauthorized persons?

- Physical & paper-based data and documentation files will be stored in clearly labeled folders within KU Leuven's office cabinet. If confidential data is physically stored, it will be done so inside a cabinet that is only open by key.
- The digitalized files will be destroyed soon after its digitalization process. Only the researcher and supervisors involved in the PhD will have access to the data and the password to access it, unless elsewhere specified. A README.txt file will be added to these folders, explaining the Use Agreements of the data.
- All data no longer needed will be destroyed in a consistent manner.
- Non-disclosure agreements will be provided if confidential data is manipulated.
- At KU Leuven, a multifactor authentication app is used to provide additional protection to all types of data.

What are the expected costs for data storage and backup during the research project? How will these costs be covered?

No extra costs for data storage are expected as OneDrive cloud storage and RDR Repository are offered for free for KU Leuven staff.

4. Data preservation after the end of the research project

Which data will be retained for at least five years (or longer, in agreement with other retention policies that are applicable) after the end of the project? In case some data cannot be preserved, clearly state the reasons for this (e.g. legal or contractual restrictions, storage/budget issues, institutional policies...).

Only relevant data for the reassessing of the research will be preserved. This is special true to the following datasets:

- Research Activities - Modeling
- Research Activities - Computation

The remaining datasets will be screened and will have data carefully selected in order to not keep unwanted, irrelevant data in the storage.

Where will these data be archived (stored and curated for the long-term)?

For the long-term, the data will be archived at the KU Leuven Research Data Repository (RDR).

What are the expected costs for data preservation during the expected retention period? How will these costs be covered?

No extra costs are expected.

5. Data sharing and reuse

Will the data (or part of the data) be made available for reuse after/during the project? In the comment section please explain per dataset or data type which data will be made available.

- Other, please specify:
- No (closed access)

Not applicable.

If access is restricted, please specify who will be able to access the data and under what conditions.

Not applicable.

Are there any factors that restrict or prevent the sharing of (some of) the data (e.g. as defined in an agreement with a 3rd party, legal restrictions)? Please explain in the comment section per dataset or data type where appropriate.

- No

Where will the data be made available? If already known, please provide a repository per dataset or data type.

Not applicable.

When will the data be made available?

Not applicable.

Which data usage licenses are you going to provide? If none, please explain why.

Open access licenses.

Do you intend to add a PID/DOI/accession number to your dataset(s)? If already available, you have the option to provide it in the comment section.

- Yes

What are the expected costs for data sharing? How will these costs be covered?

No costs are expected.

6. Responsibilities

Who will manage data documentation and metadata during the research project?

Michelle Zanettini Leichter

Who will manage data storage and backup during the research project?

Chiara Piccardo

Who will manage data preservation and sharing?

Chiara Piccardo

Who will update and implement this DMP?

Michelle Zanettini Leichter and