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MANUSCRIPT

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I would not have made it without the help of many people.

If you want to thank someone in particular, this is the place. If not, the section can be removed.

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3.1 Tree on Mount Victoria Devonport, New Zealand. Image taken by [Daniel Schwen](#) (CC BY-SA 2.5). 7

ABSTRACT

The abstract should succinctly summarise the research gap, the methods you employed, your results, conclusions, and recommendations. Don't use acronyms if possible and keep the language as general as possible.

Keep the abstract to a maximum of 500 words.

The abstract stays on its own page.

1 INTRODUCTION

Here you introduce the topic, give an overview of what you're going to discuss, and why the topic is important. In the following sections you will introduce different components that require a specific discussion. Start from the most general and proceed to the most specific. For example, start with solid waste, then waste in Africa, then the informal waste collection systems in Durban.

1.1 Solid Waste Management

Here you can start with broad overview of SWM, one of your main background topics: what it is, which SDGs are important, some global statistics, etc. This is going to prepare the reader for the next sections which will provide more detail on specific sub-sectors or processes.

1.2 Solid Waste Management in Africa

Maybe now you dive into the global differences in collection.

1.2.1 Heading level three

Going down to level 3 is not something that you should need to do often, but in this case, maybe you want to have separate sub-headings for East Africa, West Africa, and North Africa. All of the third level headings are similar and can be compared, and all of them are logically beneath the level 2 heading.

Heading level four

There are not many instances when level 4 would be necessary, but just in case, here's the format for it. Do not go to Level 5 unless your life depends on it.

1.3 Justification and Research Questions

In your final paragraph, you need to clearly frame the justification for the study – this should be obvious at this point from the clear discussion that you have presented thus far. Here, you spell it out in concise terms. Here, or in a separate sub-section you also spell out the specific research questions that you have, along with, if relevant, your hypotheses. The combination of the justification and research questions will be a clear and obvious bridge to the next chapter: Methods.

2 METHODS

This is arguably the most important section of your work. In the methods section you need to explain exactly what you did, how you did it and why you did it. Describe the work you did with enough detail that someone could replicate your work exactly.

Be sure to include the types of chemicals you used, the equipment employed, and the experimental design and sampling plans.

Below are some common sub-headings that are used, but the exact list will depend on your specific project design and method.

2.1 Site Selection

If you are collecting data outside of the laboratory, explain where your site is, how you decided on it, and what makes it especially interesting or important for answering your research questions. Photos and maps are usually appropriate here.

2.2 Sample size

Those of you conducting household surveys or monitoring programs will need to explain how you arrived at the number of samples that you included. There are various calculations that can be used, but usually, the explanation will relate to access, budget constraints, or logistics. Every explanation is fine as long as it is explained well.

2.3 Ethics

If you have obtained ethical approval for your study, cite the approval number here. Otherwise, describe the potential ethical issues associated with your project and the steps you have taken.

2.4 Experimental design

Explain your overall research design: is it a qualitative, descriptive study? A randomized control trial? A 2×2 factorial field trial? As before, explain how you decided on this design and how it will help you answer your research questions. You may need to use the lower-level sections, such as Sec. 2.4.1 and Sec. 2.4.2.

2.4.1 Experiment 1

This could also be referred to as phase one if you are not doing experimental work. If you are doing design work, this would be your first iteration and the steps you took to redesign it. Explain how you structured this work and what, if there is a second step, it does not address.

2.4.2 Experiment 2

In phase 2, we will modify the pH of the anaerobic reactor by sequentially dosing 5 mg/L of calcium carbonate each day until the reactor fails.

3 RESULTS AND DISCUSSION

This is where you present your findings. As much as possible structure your results along the lines of your research questions. Start with the simplest results first and proceed to more complex ones. Tables and Figures should be clear enough that they need little explanation: do not simply re-write the numbers as text to fill space. Rather, highlight trends, outliers, or gaps.

3.1 Discussion

Sometimes, the discussion section is separate from the results. Where to include it is personal, though it is often easier to include the discussion with the results. The discussion simply refers to the interpretation and contextualization of the results.

You present your findings (results) and then explain what they mean; how they relate to what other people have found; how they match or contradict the literature. The discussion requires references to other published works. Results sections that only present data are fine, but when there are multiple results, it is sometimes difficult for the reader to bounce back and forth between the results and the discussion.

3.2 Tables, Figures, and Mathematics

Tables and Figures are key to communicating your results so they need to be clear, organized, and well-presented. **Both Tables and Figures have to always be referenced in text.** They should be referenced on the same page as they appear, in the worst case, they can be referenced on the adjacent page of the two-page document so the reader does not need to flip five pages to find the desired figure/table. The above rule applies to the first reference of figure/table in text. You can refer to the tables and figures, you have shown earlier, as many times as you reasonably need.

Table 3.1. Waste generation and collection in urban area of Africa for the year 2012

Region	Generation kg / (capita year)	Generation 10 ⁶ t / year	Collection 10 ⁶ t / year	% collected -
Eastern Africa	185.73	12.86	4.92	38.25
Western Africa	175.37	27.02	10.66	39.45
Central Africa	194.57	11.09	4.83	40.56
Southern Africa	247.00	26.34	13.05	49.54
Northern Africa	441.80	43.95	32.27	73.41
Sub-Saharan Africa	200.67	78.12	33.46	42.83

3.2.1 Tables

Tables are numerical values or text displayed in rows and columns. When appearing in a document Tables should be numbered and appear sequentially. **Tables MUST be referred to by their number and not their location.** It is not appropriate to ask a reader to refer to a Table “above” or “below” as printing, screens, and downloads may all modify the location and lead to heartbreak. **The Table title ALWAYS appears at the top.** One can remember the location by thinking of a “table top”; this helpful mnemonic ranks among the best rivalled only by: “right-tighty, lefty-loosy”. If there is not enough space on a page for a full table, move it. Actually, latex should do it for you. Only split the table between multiple pages if it is very long. Do not force your reader to flip back and forth in an effort to remember what the column headings are, the proper formatting of a long table (with the `longtable` package) should help keeping the headings organized on multiple pages. For an example of a well-formatted Table, see Table 3.1.

3.2.2 Figures

Figures are everything else, be it a chart graph, a photograph, a drawing, or any other illustration or non-textual depiction. In APA, any type of illustration other than a Table is referred to as a Figure. Figures are, above all visual, representations of your work, so they must look good. If a picture is not of high quality, seriously consider if it is worth including. Before you include a photograph, think, what does it add? What weight does it bring to my description? Figures should be centred. They must have a descriptive title that can also include copyright information or a citation. Be concise in the title: sometimes a title that runs on to a second line is necessary, but it looks awful. The font in the figure should be of similar (if not exactly the same) size as the text font (this font). An example for referencing and licensing is given in Figure 3.1.



Figure 3.1. Tree on Mount Victoria Devonport, New Zealand. Image taken by [Daniel Schwen](#) (CC BY-SA 2.5).

3.2.3 Mathematics

All equations appearing in your manuscript are numbered. Equations should also be looked at as a part of a sentence. It is a good practice to describe all variables, together with their units, right after the equation. Example is provided as a complete paragraph.

According to the second law of thermodynamics, heat flows from the hot environment to the cold one as the temperature difference is equalized by diffusion. This is quantified in terms of a heat flux \dot{q} in W m^{-2} as

$$\dot{q} = -k \frac{T_2 - T_1}{L}, \quad (3.1)$$

where k is the thermal conductivity in W (m K)^{-1} , T_1 is the hot environment temperature in K, T_2 is the cold environment temperature in K, and L is the separation distance between the two environments in m.

The numbering of Eq. (3.1) suggests that it is the first equation in Chapter 3, it is automatically assigned by \LaTeX .

According to the [NIST guide to the SI](#), variables should be written in italic type and units in roman type, e.g., the temperature $T_1 = 300 \text{ K}$. The above guide specifies that the expression for the value of a quantity, the unit symbol is placed after the numerical value **and a space is left between the numerical value and the unit symbol**. The only exceptions to this rule are for the unit symbols for degree, minute, and second for plane angle: $^\circ$, $'$, and $''$, respectively, in which case **no space** is left between the numerical value and the unit symbol.

3.3 Licensing

Remember, it is your responsibility to comply with terms and conditions of the license of anything you include in your work. The very often used licenses are the variations of Creative Commons, referred to as CC, according to which you are free:

- to share – to copy, distribute and transmit the work,
- to remix – to adapt the work,

under the following conditions:

- attribution – you must give appropriate credit, provide a link to the license, and indicate if changes were made. You may do so in any reasonable manner, but not in any way that suggests the licensor endorses you or your use.
- share alike – if you remix, transform, or build upon the material, you must distribute your contributions under the same or compatible license as the original.

The example of how to fulfil the above conditions is provided for Figure 3.1.

3.4 L^AT_EX

File `main.tex` contains basic settings for the document. If you want to add a new chapter, add a line in the `main.tex` and create a new file with respective name in the `chapters` directory.

File `StyleAndSettings.sty` contains all the loaded packages and settings for formatting the document, text, figures, tables, and bibliography. Open the file, find the `hyperlink` package, and change the following lines:

```
pdfauthor={Author},%
pdftitle={Title},%
pdfsubject={Bachelor Thesis/Semester Project/Master Thesis},%
pdfkeywords={keyword1, keyword2, keyword3},%
```

so they describe your name, the title of your work, the level of this manuscript, and the keywords. They will be embedded in the final pdf as its metadata.

4 CONCLUSIONS

This section does not need to be long, but it needs to be concrete. Explain what you found, what you did not find, and what needs to be done next. No more than two pages maximum.

5 FEW WORDS ON BIBLIOGRAPHY

The references come last. Using a reference manager while writing, e.g., Zotero, will allow the flexibility to change between different styles in the same manuscript, while streamlining organization, and facilitating transparency with your co-authors or supervisor. When you are using a reference manager, it will create the reference list at the end of the document though you will need to check each reference to make sure the information is complete. Update within the manager and reload the list if necessary.

GHE uses APA 7th edition for our references. There are others, but this is one of the more common formats and is easy to follow. Please view the sample section below for a visual example of in-text citations. Citations should follow references to other author's work, either in the form of a paraphrase, where you summarize their material in your own words, or a direct quote. Quotes should be used sparingly and very specifically. When you quote another author you need to include the relevant page number at the end of the citation. When you mention an author by name in the text, the citation appears after the name, and you omit their name in the citation, and only include the year.

5.1 Reference format

References should be left-justified, with the first line hanging. This helps to identify individual references and keeps them from flowing into each other.

5.2 Other tools

You can proceed a citation with (see,) if you don't want to reference a specific work, but want to point the reader towards specific reading (i.e. look here). (cf.) as a prefix to a citation, in APA, works as a compare, as if you want to draw comparisons between two texts.

You can cite multiple authors at once, and it is often appropriate to do so, but do not be excessive. Concision is key, and that includes referencing. A wall of citations hurts the flow of

manuscript. Gratuitous referencing is likewise bad. Unless it is a hallmark contribution within your field, or some grand theoretical piece that keeps getting built upon, I would seriously reflect on the necessity of including anything more than a decade old. Always think, what are the key, most topical sources to include?

5.3 Referencing sample

Human activities on land are, without a doubt, the principal source of marine litter, and rivers are one of the primary channels funnelling this waste to the sea (Crosti *et al.*, 2018; Emerik and Schwarz, 2020). In addition to the impact that this pathway has had on the health of our riverine ecosystems, the growing flood of waste, and plastic waste in particular, has shaped a growing and evocative dialogue around the world's oceans in crisis, which has captured immense popular and scholarly attention (see Kalina, 2020; Phelan *et al.*, 2020; Stafford and Jones, 2019). With this spotlight on our oceans, citizen knowledge and awareness around riverine and marine waste has become an increasing topic of study. For most investigations, spatial analysis has centred on the coastline, or most specifically the beach, the space where most respondents (urban, northern, middle class), encounter marine litter (see Locritani, Merlino, and Abbate, 2019; Rayon-Viña *et al.*, 2018). Kusumawati *et al.* (2018) also centres their investigation on the beach, though within a South context, while Lewin *et al.* (2020) and Ferreira *et al.* (2020) also centre on coastlines, but through the lens of recreational or subsistence fishing. As Ferreira *et al.* (2020) point out, awareness and perception plays a key role in ecosystem management.

According to Bacchi (2015), problematizations (the noun) generally refers to the outcomes of processes of problem formation, either in the way in which problems are framed, or governmental problematising processes, while 'problematise' (the verb) tends to be used to describe what individuals or governments do in the face of problems. In other words, problematise may refer to the ways in which an individual puts an issue, object, etc. forward, or designate something, as problematic – "that, is to give a shape to something as a 'problem'" (Bacchi, 2015, p. 3).

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APPENDIX A - EXPERIMENTAL DATA

FROM SOME MEASUREMENTS

The first appendix is here. The purpose of appendices is to keep the main part of the document clear and readable. There can be many appendices, everyone should form an integral part. The following should be considered as the candidates to build appendices:

- Multi-page tables disturbing the reading with important information which you want to include your manuscript;
- detailed schematics for which you provided a simplified version in text (you can refer to the more complex scheme in an Appendix and only show the simplified scheme inside the main text).
- important pieces of code allowing for validation of the results. Most of the code will probably go to the git repository anyway.
- multiple figures of some properties, showing that the solution described in the manuscript is capable of calculating the properties shown in an Appendix but the values in figures do not have the crucial significance for the research/engineering plot line of your manuscript.