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**Review PhD Thesis by Ing. arch. Bardhyl Rama, titled Ecodistricts – principles of planning and designing based on case studies**

This is the review of the PhD thesis by Ing. Arch. Bardhyl Rama, titled "Ecodistricts – principles of planning and designing based on case studies."

The topic of the PhD thesis are ecodistricts, which are settlement quarters that have been designed with special care for sustainable and ecological principles. The specific contemporary focus on sustainability and ecology is fairly new – some three to four decades old - although one could argue that it could be traced to Ebenezer Howard's Garden Cities of Tomorrow from 1898 (mentioned also by the author on page 29).

After the Introduction, Chapter 2 provides a literature of a variety of topics related to the topic of ecodistricts. The main part of the thesis is formed by Chapter 3, a detailed case study analysis of three selected examples of ecodistricts. Chapter 4 summarizes the common denominator between the case studies. Chapter 5 draws detailed conclusions based on the case studies. Chapter 6 draws the final conclusions of the research work.

The written text as it is presented in this form, falls short of a scholarly report of scientific work. This is manifested in all chapters of the thesis text, and will be discussed following the Chapter structure.

Chapter 1: Introduction

Chapter 1 starts out with the observation that cities and urban areas are highly energy intensive, using almost two-thirds of the total energy consumption. It is logically clear that this is a huge problem, which needs to be addressed. However, we learn no more about this problem in any detail. There is no breakdown into aspects that give information: what proportion goes into heating using fossil fuels? What proportion goes into drainage and wasted water? What proportion goes into heat island effects? What proportion goes into transportation? Following this, we can then make an educated guess where ecodistricts can

make a difference, and also how much effect we could expect from this. Additionally, this could give an idea where the most efficient results could be obtained.

The research hypothesis is stated on page 17 as follows: "By analyzing and examining data from the existing case studies we could identify a number of categories and indicators which enable proposing a set of principles for planning and designing ecodistricts."
The hypothesis has two claims: (1) we can deduct from case studies generally valid aspects of all ecodistricts; and (2) we can formulate principles that are helpful for planning and design of such ecodistricts.
Claim 1 is straightforward where it concerns the analysis aspect. It does not really pose a testable challenge, the answer is known in advance – yes, we can analyse several examples and learn from them. What is not clear however, is the question how many case studies do we need to analyse so that we can draw valid conclusions for all ecodistricts in a reliable manner? The implicit answer in this PhD thesis is that it is enough to analyse 3 ecodistricts, without providing evidence for this. I will return to this aspect in the discussion of Chapter 3.
The second claim is straightforward where it concerns the formulation of principles. However, these principles can only be tested by actually going through the process of planning and designing ecodistricts, and verify whether the principles are helpful there. This is however not part of the research, so this assumption can never be refuted nor verified.

On page 20-21 the author mentions a number of upcoming technologies that can be expected to be implemented in the near future in cities, and which could have a positive impact on ecodistricts (for example drones, autonomous vehicles, Smart Cities). The author has the ambition to formulate the research framework such that it can "accounts for and acknowledges the potentials and likelihood of these future technological applications."
However, this ambition is not tested through the case studies because these advanced aspects were not present in the cases, and it is also not addressed in Chapter 5. The text of a PhD thesis should contain only work that has been actually been done. Everything else, no matter how interesting by itself, should be eliminated from the text. At the very most, it could be possible to include a Future Work or Future Research section that could speculate on such matters.

Chapter 2: Theoretical background
The theoretical background should present the state-of-the-art review of research and developments concerning ecodistricts.  The Chapter has a number of rather short sections that are all somehow related to ecodistricts: sustainable development, sustainable architecture,

built environment, cities, ecocities, Smart Cities and neighborhoods, Ecodistricts, Econeighborhoods and eco/sustainable communities, sustainable buildings, building design, building sustainability assessment, Livability, urban planning and design, green infrastructure, Open/Green spaces, social and cultural dimensions, human behavioral, and sustainable development paradigm shift.

There is no over-arching argument that explains why exactly this spread of topics is sufficient and necessary to discuss ecodistricts. This is mainly due to the reason that there is no theoretical work on which the author borrows the list of necessary properties of ecodistricts. Closely related to this is the lack of a history of the concept of ecodistrict, and the lack of a critical definition of a ecodistrict. For example: what are the defining distinctions between an econeighborhood, an ecodistrict, and an ecocity?

On page 34 the author mentions that already several certification systems exist for sustainable urban districts: LEED ND, CASBEEUD, DGNB UD, BREEAM Communities, SCTool, and many others. So what is then new in this PhD thesis? Was there a knowledge gap? Were there perceived disadvantages in these systems? What is the goal of the work? How can you assess what new knowledge has been gained, or something improved?

Chapter 3: Case studies: Analysis of selected ecodistrict sites
The author claims that many cities in Europe have successfully implemented ecodistricts, however no further evidence of this claim is provided. There should be at least a table listing all ecodistricts, including location and year(s) when they were realized. There is no argumentation why then selection of only three cases is enough for analysis. There is no argumentation why all selected cases are located in Germany, and why in particular these three were selected.

The author puts strong emphasis on personal visit to the selected case studies. In my view, this is an interesting and innovative point that deserves more attention. For example, does the author feel from the basis of Chapter 2 that something profound is lacking in our understanding of successful ecodistricts? What is the perceived added value of personal visit compared to literature review?

Three selected cases are presented in detail in Chapter 3: Vauban, Freiburg; Kronsberg, Hannover; and Bahnstadt, Heidelberg. It is a pity that basic information when those ecodistricts were realized is not available in the text.

Each case study is described in detail based on literature review, the author's own impression through site visit, and questionnaires answered by inhabitants.

This list of questions is included in Appendix 7, but there is no information to how many people

it was sent, how many people answered the questionnaire; how many answers were valid, and how they were analysed.

On page 118 (case Bahnstadt), density is calculated as 113.3 residents/hectare. With 6800 residents and 116 hectares mentioned earlier in same table, the density is 6800/116=58.6 r/h, surely not 113.3.

**Chapter 4: Identification of key urban and architectural categories and indicators**
This Chapter provides a summary of the main elements that all case studies have in common and are relevant to ecodistricts. The argumentation is clear and the final table is based on the available data.

**Chapter 5: Principles of planning and designing of ecodistricts based on case studies**
Chapter 5 summarizes all the findings of the case studies and identifies properties of ecodistricts. Methodologically this is not allowable. It is not possible to claim first that there are many already implemented ecodistricts throughout whole Europe, then analyse only three without explaining why they are representative, and finally draw conclusions for the whole set of all ecodistricts based on just three cases. That leads to absurd conclusions, as can be seen readily on page 132. There it is concluded that the site conditions are 2 out of 3 brownfields. Therefore 66% of all ecodistricts in Europe are set on brownfields?
This chapter should be renamed Comparison of Case Studies and have some critical feedback, where possible, to the whole set of all ecodistricts. Ideal would be to make this structured and valid for the whole set, but that would require a whole new research. Nevertheless, the discussion could be expanded with some annotated and informed knowledge of some examples that were not part of the case studies.

**Chapter 6: Conclusion**
Chapter 6 draws the conclusions based on the work reported earlier in the PhD thesis. Apart from the criticism I mentioned concerning Chapter 5, the conclusions drawn in Chapter 6 are clear and do follow from the text.
What is particularly missing in my view, is a reflection on the usefulness of the personal visit to the case study sites. In my view this is an important contribution of the researcher that deserves more attention.

**References**
The literature list is not complete. Balaman (2019) mentioned on page 39 is not in literature list;

Sperling (2002) mentioned on page 58 is not in literature list; Trojanowska (2019), mentioned page 39 is not in literature list.

AARP (2005) - AARP is not the author, that is Kihl, so this should be listed based on Kihl, not AARP.

Ingersoll (2012) reference (mentioned p. 36) in incomplete in references. Has no source.

Joss (2010). incomplete - no source.

Several internet sources do not have the date included when they were accessed.

Why do some sources start with a tabulated position, and others not?

Bice et al. (2011) has *2011)

To conclude the review of the PhD thesis, in my view the thesis text as it stands now cannot pass for successful defense of the dissertation work. I recommend that the thesis be renewed to address the points raised above in the review, and submitted again.

Thank you for your consideration,

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