The quest for the most eco-friendly solutions for long-term housing changes

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Abstract. Lodging changes are an intriguing intercession with regards to post-war lodging regions. Two contextual investigations show that lodging changes can fill the hole among solidification and huge scope destruction. It is regularly said that this causes less natural effect. In any case, very little information regarding this matter is accessible yet. Naturally contrasting lodging changes versus new development not just needs to manage ecological effects during development, yet in addition with ecological effects after some time. An equilibrium must be looked for between these two sorts of natural effects. That is possible by learning typical yearly natural impacts from the hour of interesting advancement up to and including discard around the completion of-life of the housing change or new turn of events. This is against current evaluations of differentiating choices over a comparable lifetime. The system will be attempted in the accompanying period of the assessment.

1. Introduction

The greater part of the lodging stock in the European Union was worked after the subsequent universal conflict. Quantitative deficiencies brought about colossal mass lodging creation. These days the volume of the lodging stock is adequate. On the other hand subjective deficiencies are developing. Particularly the post-war mass lodging doesn't satisfy current necessities and countenances the danger of huge scope destruction. Metropolitan recharging is regularly founded on the choice between destruction or combination with simply some little intercessions. Redesign based methodologies are generally not thought of. By the by, Thomsen and Van der Flier [1] contend that refreshing the lodging stock requests remodel-based methodologies, in view of the declining yearly lodging creation. The yearly lodging creation scarcely surpasses 1% of the complete lodging stock. Regardless of whether this lodging creation is completely intended to supplant destroyed houses it takes over a century to totally supplant the lodging stock. At last they express that natural supportability and decrease of energy utilization as indicated by the Kyoto arrangement supplication for remodel based procedures rather than destruction.
As indicated by te Velde [2] manageable metropolitan recharging implies that at any rate the current stock is managed cautiously. Te Velde considers change to be a combination among old and new, as a center course among union and huge scope destruction of the current designs of neighborhoods. Existing social and physical designs can show characteristics and openings for the purpose of protection. An equilibrium must be looked for among conservation and vital reestablishment. This exploration centers around the level of lodging. At this level lodging changes are characterized as intercessions modification the separation of a structure block. Models are transforming at least two houses into one, adding at least one stories and transforming stockpiles on the ground floor into lodging.

Lodging changes being naturally favored contrasted with destruction is, in any case, an untimely conviction. Strategies and instruments are missing to have the option to analyze the natural effects of mediations in the lodging stock [3]. The consideration paid to methodological issues with respect to ecological appraisal of redens is developing. In spite of, there isn’t yet an overall system for looking at he natural effects of lodging changes against new development. This research means to clarify the quest for the most environmental proficient procedures for reasonable lodging changes based on two contextual analyses. It examines which lodging change choices are conceivable and how the ecological effects can be surveyed and contrasted with new development.

Area one presents two contextual investigations on lodging changes. In segment three an answer for ecological examination between lodging changes and new development is talked about. Area four includes the ends.

2. Study Case on lodging changes

Contextual investigations in this exploration are two lodging zones two lodging zones after war, that face now the main rebuilding tasks: the first zone is in in The Hague the Morgnstond Midden while the second one in Delft the Poptahof . Netherlands is the city where both zones are located. These zones are picked, in light of the fact that the typology of the space just as the lodging in the space varies, yet the two of them happen a great deal. Lodging change choices are depicted in segment 2.1 and 2.2 separately. Segment 2.3 burdens the actions for both contextual investigations to be earth surveyed and contrasted with new development.

2.1. Morgenstond Midden lodging changes choices

This zone is an area inherent the fifties of the earlier century, basically comprising of dwellings of three or four stories . Practically all lodging in the zone it will be destroyed by the restoration planning system. The region must be changed into a conservative metropolitan nursery city [4]. These lines of the local might be encircled by lodging with 5 or 6 stories.

In central avenues all houses might be worked with 4 stories; in different roads houses will be worked with 3 stories. The leftover internal region might be saved for exceptional lodging conditions and unique lodging sorts. This prompted a lodging system of destruction with 2350 from the old houses and developed 1650 new houses (5).

The examination on lodging change alternatives focused on 2 structure blocks, where are orbited in the upper left corner. Four stories, one hundred fifty two houses all make up the mass(block) of the top structure which is essential for the line of the space. While hundred and two houses make up the lower mass(block) of the structure, which is isolated and has more than 3 stories.

In the four-story mass contains the accompanying scale of lofts:

- Type B: twenty-four apartments each one with 3 rooms
- Type C: twenty-four apartments each one with 2 rooms
- Type A: eight apartments each one with 5 rooms.

While the three-story building includes:

- Type B: fifteen lofts with 3 rooms
- Type D: fifteen apartments with 4 rooms
- Type A: six lofts with 5 rooms.
It worked out that the structure blocks have great freedoms for change. The heap bearing construction and measurements don't frame any boundaries for specialized arrangements, which can pull in new objective gatherings. Conceivable new separation plans. The four-story block is through its boundary position appropriate to reach out with one story. At that point adding a lift is plausible, so the three upper stories can be changed for the old. For that each two houses on the current stories must be evenly made (R1). The modification story might be fabricated like the current stories (R2) While the two basement floors were merged in a vertical manner so that they were small houses that could be displayed in the real estate market vertically in small houses first in the real estate market (R3). As for the three-storey building, it was found that it is subject to change into small dwellings sufficient for one family (R4). And given that there is no convincing enough reason and economic feasibility of replacing the upper apartments consisting of five rooms, so they were kept as they are without change as they are as this kind has future worth all things considered.

![Figure 1](image1.png)

**Figure 1.** Current differentiation schemes in Morgenstond Midden.

![Figure 2](image2.png)

**Figure 2:** New differentiation schemes in Morgenstond Midden.

### 2.2. Poptahof lodging changes choices:

This area is a neighborhood with mostly gallery apartments that were built in the 1960s. It consists of two groups, the first group of eight blocks of eleven floors and one thousand eleven houses, and the second group of six blocks of four floors and four blocks built with houses of one family. The idea of the urban re-establishment program aims to remove the four-story blocks and single-family homes and remodel them into the eleven-story block shape [6]. The dark square shapes in the left image represent...
the squares to be removed while the dimmed dark square shapes represent the squares that can be modified. The goal is to create a design system consisting of eight new areas which are light-dark demonstrated in the correct picture.

For the purpose of conducting the examination to conduct the housing changes, six of the eleven-storey housing blocks have been chosen, which are identical in design and consist of four parts in each of the six residential squares;

Part of ninety-nine houses
- Type A and B consist of seventy-seven houses, each with 4 rooms,
- Type C and includes eleven houses in each of them two rooms,
- Type D and includes eleven houses, each with three rooms.

The size of the apartments varies somewhere in the range of 61 and 73 m². The stocks are on the ground floor.

The total width apartments designed in the 1960s are characterized by being of adequate sizes and spaces compared to the dwellings of the 1950s, where although the corridors used between the apartments take a large area, on the other hand, they provide great freedoms to change the structural blocks [7].

The redesign system includes the formation of four residential models:

- The first is to tackle the mysterious ground floor issue by replacing part of the stocks and getting the ground floor with the main story where small homes can be made for families (M4).
- Converting the warehouse adjacent to the elevators into two-room apartments for the older people (M1).
- The upper apartments adjacent to the elevators are re-designed to accommodate the the older people (M2) while (M3) is to convert the upper flats into four-room flats that make condos will be adequate.

![Figure 3. Current differentiation scheme in Poptahof](image)

![Figure 4. New differentiation scheme in Poptahof](image)
2.3. Housing change Procedures

When making any change in the building structures (lodging stock), this leads to the re-design of the floor plans in a new way and the emergence of new paths where the goal of re-designing any building is to exploit the possible spaces while providing freedom of movement and most importantly that the improvement continues for a sufficient period of time up to 50 years. The changing nature may be made by adding own entrances, expanding external spaces and recharging of establishments. Table 1 records all actions required, with the exception of alternative R2 and M2, on the grounds so those represent new development

| Measures                                | Option R1 | Option R3 | Option R4 | Option M1 | Option M3 | Option M4 |
|-----------------------------------------|-----------|-----------|-----------|-----------|-----------|-----------|
| Change of floor plan                    |           |           |           |           |           |           |
| Limited change of floor plan            |           |           |           |           |           |           |
| Change of floor plan for elderly        |           |           |           |           |           |           |
| Application of inside stairs            |           |           |           |           |           |           |
| Replacement of storages                 |           |           |           |           |           |           |
| Shell                                   |           |           |           |           |           |           |
| Application of new facades              |           |           |           |           |           |           |
| Change of facade appearance             |           |           |           |           |           |           |
| Application of new entrance             |           |           |           |           |           |           |
| Outside space                           |           |           |           |           |           |           |
| Enlargement of balconies                |           |           |           |           |           |           |
| Application of terrace                  |           |           |           |           |           |           |
| Application of gallery                  |           |           |           |           |           |           |
| Application of elevator                 |           |           |           |           |           |           |
| Thermal and sound insulation            |           |           |           |           |           |           |
| Insulation of facade inside             |           |           |           |           |           |           |
| Insulation of facade outside            |           |           |           |           |           |           |
| Replacement of panels                   |           |           |           |           |           |           |
| Insulation of roof inside               |           |           |           |           |           |           |
| Insulation of roof outside              |           |           |           |           |           |           |
| Insulation of floor                      |           |           |           |           |           |           |
| Application of floating covering floor   |           |           |           |           |           |           |
| Application of facing walls             |           |           |           |           |           |           |
| Installations                           |           |           |           |           |           |           |
| Renewal of individual installations     |           |           |           |           |           |           |
| Renewal of collective installations     |           |           |           |           |           |           |

3. Environmental assessment of housing variations against new creation:

For evaluating the natural effects Life Cycle Assessment (LCA) which is a generally acknowledged technique. LCA is a strategy in order to examine the ecological weight of items (products and labor) from the beginning to ending. Including the extraction of raw materials and; how the required materials are produced, used, and then disposed of, which includes either reuse or removal [8]. This procedure can be defined as the "gathering and assessment of the information sources, yields and likely ecological effects of an item framework for the duration of its life cycle" [9]. The item framework is the all-out arrangement of cycles required for the item, which for this situation is a house. Sources of data and yields are energy and construction materials, which input and go away one at a time the object framework.
LCA of structures is muddled, in light of the fact that each building has its own merits and characteristics in terms of containing an enormous number of parts and materials. Other than structures there are some gadgets at the moment that are indispensable that provide surprisingly tremendous assistance to, for example, electronic equipment such as computers. Numerous progressions happen during the help life of a structure. Notwithstanding, current entire structure ecological evaluation instruments don't consider changes in building attributes after some time. They are handling the natural results of a structure all through its management life because it changed into to begin with constructed. They do not address the herbal results of building adjustments [10], while those modifications can also completely dissatisfy the anticipated existence cycle.

We illustrate what happens with natural forcing while mediating the first life cycle. The natural effects of the first (original) house, with an expected auxiliary life of seventy-five years, consist of: First, the environmental impacts of development in Year 0, which represents the beginning of work, Secondly, the environmental effects of alternatives, maintenance, energy use, and water use, from the year 0 the start of work until the year seventy-five, the end of the life span of the facility, And finally, the environmental effects when it was removed and disposed of in the year seventy-five.

The natural effects of the first house increment by change in year X (Itransformation), while on the identical time the cycle of life increases. So change in year X causes the attendant adjustments in the cycle of life: First, the cycle of life extends from year X until year Y1, Secondly, the natural effect increases because of expansion of new parts in year X, Third, the ecological effect diminishes attributable to evacuation of segments which don't need to be supplanted or kept up any longer from year X until year Y1, and Finally, the natural impact changes thru modified power use and water use from year X until year Y1.

New development is required to create extra natural affects by using improvement, yet much less ecological outcomes by through electricity use and water use (Inew) Besides, new development is required to receive a more drawn-out assistance life than lodging changes (Y2).

To have the option to contrast lodging changes and new development lifetime is the main issue. This is because of the way that meditations like destruction or changes are frequently required before the normal help life of a house has lapsed. This case represents the development and improvement of the housing stock after the war in particular. At any rate the way in which the environmental capital will be assessed for the period from year X through year 75 must be considered. The fact is that the normal impacts must be taken into account from year 0 through year Y1 and Y2 separately. This is contrary to most current views that LCA concludes in a similar time frame [11]. Nonetheless, the decision of this timeframe is totally discretionary. Consequently, it is contended that the normal yearly natural effects from year 0 until year Y ought to be viewed. At that point the natural effects of lodging changes against new development are equivalent.

4. Conclusions

Structures or buildings in two areas Morgenstern Midden in The Hague just as Poptahof in Delft are appropriate for changes. Other than new separation bringing about redesigning the plans and exterior courses of action, improvement measures must be taken as for outside space, warm and sound protections and establishments. Identified with new development, as a rule lodging changes cause fewer natural effects by development, yet more ecological effects by activity. Moreover, changes to lodging are required to gain the longest viable lifestyles of the structure after its improvement and redesign, supplied that the regular annual environmental affects over the whole lifestyles cycle are advocated. The total lifestyles cycle is the length extending from a completely unique development to its disposal segment in the direction of the give up of the life of a housing change or new development. In the next stage of exploration, the lodging change will be made in different place like the buildings located in some areas of Iraq for the purpose of studying the extent of the possibility of redesigning or improving the facilities already in Iraq and comparing them with the construction of buildings or housing structures for the same areas and the extent of the impact of this in terms of the environment and the increase in the number of Population and the spread of residential lands in the regions and thus economic viability. To determine which is better in terms of redesigning, improving or removing
buildings, re-establishing new structures, or as a third proposal to change housing. Herewith the theory can be tried that lodging changes have a lower natural effect than destruction and new development.

Obviously, it must be remembering that lodging changes will infrequently be liked from an ecological perspective in particular. Advancements on the real estate market are undeniably more significant. Producing information regarding this matter, nonetheless, empowers to consider natural contemplations.

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