

REDESIGN OF A RECEPTION AND IDENTIFICATION CAMP FOR REFUGEES ON THE
AEGEAN ISLANDS

Research plan
AR3A010

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0.

INTRODUCTION

The aim of my graduation project will be to redesign the in September 2020 burned down Reception and Identification Camp (RIC) Moria, Lesbos. A RIC is a camp in which refugees have to stay until their asylum request is processed, before they are allowed to move to their final destination in Europe.

Problem statement

In short, the problem with RIC Moria was that it was in extremely poor condition. This means the following.

On an architectural scale, tents and other shelters provided by NGOs and UNHCR, and improvised shelters by refugees due to overcrowding, are not able to cope with the climate. Winter temperatures on Lesbos island vary between a low average of 3 °C and high average of 11 °C. Summer temperatures vary between a low average of 17 °C and high average of 34 °C. With extremes ranging from -7 °C to 39 °C. (meteoblue, 2020) Flooding is a regular problem, tents blowing away and mud on the passages between tents. (ANSA, 2020; Grant, 2020) Which means in winter is extremely cold in their shelters. Since most of the shelters lack electricity, active cooling is not an option, and airflow through the tents is needed for cooling. These shelters also lack any transition from public to private. These circumstances are detrimental to the mental health of refugees which in most cases already needs attention. (International Rescue Committee, 2018) These mental health problems are also exacerbated by the fact that people in these camps have no chance to partake in activities throughout the day and are completely dependent on others. (Bjertrup et al., 2018)

On an urban scale the camp is segregated and isolated from its surroundings. Consequences of this segregation is the lack of economic exchange and social integration of the camp with its surroundings. (Werker, 2007) One of the reasons for this, is that refugee camps are viewed as something temporary, (while in reality, refugee camps can be classified as permanent (Radford, 2015)), alien to its surrounding, in which humanitarian aid is provided, with decisions for design being made top-down.

Scope

I understand that there are several different fields beside architecture which have led to this situation as described above. Refugee camps are not structured in this way by chance. I cannot change policy, nor be an expert in all the complex fields involved in the matters of refugees and refugee camps. This project can highlight a different approach to designing refugee camps from the way it is done now, and how architecture could contribute to a refugee camp beneficial for the health of the refugee and its surroundings, addressing the problems mentioned. It can be a small part in the larger discourse of refugees, inciting a different look and proposing a different model on the whole matter.

Relevance

The need to provide for shelters which provide comfort in terms of temperature to improve the mental health of the refugees, is clear. What's more, Killian Kleinschmidt, a prominent figure in the world of aid workers working over 25 years (1992-2014) as a United Nations official mostly under the UNCHR (United Nations High Commissioner for Refugees), argues for a change on matter of dependence by the refugee. He argues that refugees should be able to be (economically) active, and shelters should be able to accommodate for this, and that economic integration could be beneficial for both refugees and host-

country. Besides this, he observed the need for privacy and flexibility in shelter design, for the refugee to make their home. (Kleinschmidt, 2020) Bjertrup et. al. have found that having lack of control, no activities besides waiting to receive aid, and isolation from surroundings are cause for psychological distress. This calls for a different approach in refugee camp design. Jahre, Kembro, Adjahossou, & Altay, (2018) dive into this in their study of approaches to refugee camp design. Going from a top-down to bottom-up approach in the design process, in which not only refugee but also host-community are involved, has positive effects welfare, wellbeing and economics for refugee and host country. For the refugee it increases their mental health and independence from aid, for the host-community it can have a positive effect on economics. In this, resource sharing is important, from services of the refugee to material from the host community, according to Kleinschmidt. (Radford, 2015) Providing spaces like markets in strategic points, accessible by refugee and host-community, and spaces in houses to provide these services is a step in this direction. (Jahre et al., 2018) Werker (2007) also argues for less segregation for the purpose of economic and social integration, in which decreasing barriers between camp and surroundings, and placing a camp near urban places is necessary.

Overall Design Question (ODQ) and Thematic Research Question (TRQ)

This leads to the following ODQ:

How to redesign the layout and shelters of Reception and Identification Camp Moria, Lesbos, into a sustainable, affordable and climate appropriate design, fostering economic activity and interdependence with its surroundings?

In the research on how to approach question and discussion with my tutors, using straw as a building material as a possible solution came to light. A noteworthy aspect is, that it is a by-product of cereal crops used to make food. Because of this, the hypothesis is that by using the straw as a building material for the design of the shelters in a RIC has the following advantages.

- it can help refugees to be (economically) active by cultivating cereal crops (to be specified in the thematic research), by processing these crops into food, and the straw into buildings
- the possible low-tech solution of building with straw means that refugees can be directly involved in the building process
- has the insulating capacity to withstand Mediterranean climate
- the building process and cultivation of cereal crops and processing to food could benefit the local economy as well
- another point of appeal is the possible low costs of the building material

Since my knowledge on straw as a building material is limited, the first step into finding out whether this hypothesis is true, is gaining a deep understanding of straw as a building material. This will be the focus of the Thematic Research. This leads to the following Thematic Research Question and sub-questions thereof.

What are the possibilities of using straw as a building material to create climate appropriate, affordable, low-tech, self-buildable dwellings?

- *What are the building physical properties of straw?*
- *What construction methods for building homes with straw do exist?*
- *What types of cereal crops are most suited to gather straw for the purpose of building?*
- *How much straw and cultivated land of cereal crops are required to meet the need for the aforementioned construction methods?*

1.

RESEARCH FRAMEWORK TRQ

The goal of the Thematic Research is to create an understanding of the possibilities of using straw as a construction method and the construction process, in relation to affordability, low-tech and self-buildable.

This Thematic Research will be descriptive, and the conclusion of it will be used as a tool for selecting building methods and further research into the possibilities of applying straw in refugee camps. This will be a mix between a qualitative and quantitative research, belonging to the make and flow research-by-design domain. The first part, sub-questions one and two of the Thematic Research, studies the aspect of construction with straw. The second part looks at the origin of the building material, understanding the different types of cereal crops/straw, quantifying straw yield from cereal crops and straw usage for the different types of construction methods.

The terms affordable, low-tech and self-buildable will be qualified in the first part of the research. There are many variables which go into the make-up of the total cost of a house. This makes it impossible to take the whole house into account when talking about affordability. For this research, affordable will be qualified by looking at building material cost of straw as an insulation material (and when used as a loadbearing wall, also as the structural material for the wall) versus most common insulation material. This can be looked at in combination with workload to construct the wall in hours and the need for professional contractors. The last part of professional contractors in combination with the need for professional equipment will also be the measure for qualifying low-tech and self-buildable.

The first sub-question will deal with understanding the building physical properties of straw. To clarify, properties of insulation, fire resistance, acoustics, and water resistance as well as affordability will be researched and listed.

The second sub-question is "*What construction methods for building homes with straw do exist?*". For this question, the focus will be on main construction methods (loadbearing straw bale wall, vs non-loadbearing straw bale wall) and within these methods, attention will be paid to the three elements which constitute the shell of a building, the roof, façade and foundation.

Since the cereal crops themselves are also of interest in the overall project, the third question deals with the aspect of which cereal crops produce straw best to be used in construction. A short but necessary step, since this information can be used in the future, to research whether these types of crops can be cultivated on the island of Lesbos.

The fourth question deals with the amounts of straw in relation to available construction methods. Meaning, how much land of cereal crops has to be cultivated in order to create a certain amount of wall.

Methods

Through literature review including books and journal articles on construction methods and on building physical properties of straw bale buildings the first and second sub-question will be answered. For the first question, the data of the building physical properties of straw will be compared to the Greek building code, to see whether they meet the standard required for single storey residences. In this segment, affordability and potential for climate appropriate design on Lesbos will be discussed. For the second question, differences between the various types of construction methods and their intricacies will be discussed. These intricacies will consist of, low-tech and self-buildable as defined in the first part of the thematic research.

The third question will be a short segment in the whole. It will result in a list of most suitable cereal crops. Literature reviews on most used straw for buildings and their properties and climate requirements for growing will be conducted.

After this, a quantification of the flow of straw will be made through analysing existing data on straw yield for the analysed, which is in kilogram (or kilotons) per land unit (hectare). Another part is calculating the amounts of straw needed to build different types of wall, the unit for this is usually kg/m^3 .

The result will ideally be an understanding on straw yield per type of straw per unit of cultivated land (example square metre) and how this amount of straw corresponds to the building of square metre of walls. Together with the previous findings, an understanding of how much cultivated land for how much wall for the different types of construction is developed.

2.

PRELIMINARY CONCLUSION CHOICES AND STRATEGY

The aim of the thematic research was to figure out whether straw as a building material could meet the criteria as defined in the thematic research of affordable, self-buildable, low-tech and climate appropriate to Greece. The conclusion on the one hand that the building physical properties are such that they are suited to be used as a building material. Fire resistance, possibilities for insulation, waterproofing and airtightness are sufficient to meet the building code. On the other hand, there is a construction method with straw which meets the criteria mentioned above. This method consists of using straw bales in a loadbearing fashion, where the transfer of the loads of the roof to the foundation goes through the straw bales.

With all of this, the focus until now has been on the process, and this does not result directly in a design. This construction method has influence and limitations on what is possible in terms of designing dwellings. Because of this, the next step will be to test whether these limitations are of such extend that they make this method unfit for use in creating dwellings in a RIC. Which means that besides the aspects mentioned before, further research into the need of the refugees in terms of dwellings will be conducted.

The numbers for straw yield were difficult to come by; this will need further research. Contacting farmers directly to get reliable numbers will be the next step in this process.

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