MASTER'S THESIS ACEX30

What challenges does an aid project team face during a mission in a foreign country?

The Mkula Hospital Project case study

Master's Thesis in the Master's Programme Design and Construction Project management

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Abstract

A case study in Mkula Hospital was used to evaluate the communication within an aid project team as well as between the team and the locals on site. During the two months stay, four students helped the hospital to oversee the construction of the RCH building (Reproductive and Child health) and then based on the leftover budget develop and design further projects in cooperation with the hospital management team. During this time, all the factors that affected the project were collected, such as, communication, cultural differences, and trust. These were identified as the main factors that influence the progress of the project and thus must be carefully evaluated before, during, and after each virtual team project to avoid the same mistakes in the future.

Keywords: Aid project teams, trust, communication, virtual teams, cultural differences

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ABBREVIATIONS

AICT | African Inland Church of Tanzania
HHPG| Healthy Hospital Project Group
EWB | Engineers Without Borders
HMT | Mkula Hospital Management Team
NGO | Non-Governmental Organization
RCH | Reproductive and Child Health
SIDA | Swedish International Development Cooperation Agency

1 Introduction

According to Fengler & Kharas (2011), the aid project environment has reshaped in a significant way during the last decades. The number of the aid projects has increased but private donors faced lots of challenges through virtual aid projects. One issue in virtual aid projects is culture and language differences (Hofstede, 1987). However, cultural and language differences are not only the challenges brought about by virtual aid projects but also trust and communication between stakeholders throughout the whole project duration.

In the year 2000, world leaders agreed on eight development goals to create a sustainable future for the citizens of the world (United Nations Secretary-General 2006). The eight Millennium Development Goals, MDGs, were established to reduce extreme poverty and to improve the lives of the world's poor. These have recently been replaced by the Sustainable Development Goals (United Nations 2016). In Tanzania, all MDGs have not been achieved yet, but the country has made progress in some indicators, such as the fourth goal of reduced child mortality. However, for the goal of improved maternal health, the country is lagging.

According to SAVU (2019), in the construction industry, using virtual teams has become efficient for performance in the management of the industry due to technology integration and management of the virtual resources. However, due to the birth of international teams, the use of virtual teams faces severe challenges, with members scattered in different geographical locations. For example, even in traditional teams where meetings are held in person, communication and trust have become problems. When the nature of virtual teams introduces language, time, and cultural differences, the problem still exists.

Therefore, for this master's thesis, a case study was conducted in a hospital in Mkula, Tanzania, the main purpose of which was to improve the challenges faced by the aid project team during its mission abroad. The project is called the Mkula Hospital Project and our participation lasted for eight weeks. During this period, we cooperated with multiple stakeholders from different cultures and backgrounds. Throughout our case study, we observed and conducted information about this paper, focusing on introducing the idea of a virtual team while investigating the challenges faced by the construction industry.

1.1 Background

Tanzania is a country in East Africa in the Great Lakes region of Africa, and it has received the most aid. Nearly one-third of its government expenditure is funded by foreign aid (Tanzania Development Partners Group, 2019). Tanzania is a country with a population of 57 million people, most of them are suffering from poverty (The World Bank, 2019). Furthermore, half of the people in Tanzania lack clean water and find it hard to have access to a proper clean toilet (WaterAid, 2019). However, in the recent years, living conditions and human development results have been improved. The Swedish public agency Sida is committed to alleviating poverty. Since then, they have been cooperating with a handful of East African countries (and even Tanzania) since their independence was in 1964. Sweden is one of Tanzania's largest donors, and one of the main goals of the cooperation is to contribute to reducing Tanzania's dependence

on aid (Sida, 2019). The Mkula Hospital project was originally initiated by the Swedish Health Hospital Project Group (HHPG) with the goal of improving the healthcare of the Tanzanian hospitals.

1.1.1 Healthcare in Tanzania

According to the World Health Organization (2014), drinking water and decent sanitation facilities prevent many people from being exposed to common diseases. Depending on the type of area, there are different ways of obtaining drinking water. In the main cities of Tanzania, drinking water can be provided to 80% of the population, while in the villages and rural areas, this proportion is only 45%. Moreover, we shall support the development of the country as well as the country's economic and social growth so that the population can have access to adequate and proper health care services and facilities.

1.1.2 The Mkula Hospital Project

Leaders all around the globe have agreed to strive for a better world together with the 17 goals for Sustainable Development (EU, 2019). Some targets included are good health and well-being and clean water and sanitation. Last but nevertheless important is the partnership for the goals where two of many countries involved are Sweden and Tanzania.

The Mkula hospital and village in northern Tanzania cover a small portion of the 8,500 residents. The Mkula Hospital has a catchment area of around 200,000 inhabitants around the main district of Busegas (Cronemyr, 2018). The hospital was established by the African Inland Church Organization of Tanzania (AICT) in 1986 and is currently managed and operated by the organization. The number of inpatients in the hospital is approximately 45-50 per day, and 4-5 deaths per week. Furthermore, the hospital has a function as a daily health care function with around 30-40 people arriving per day.

The current situation in Mkula was written down through a survey report in 2018 where the current infrastructure, future challenges, and suggestions of future work were described (Nanette Cronemyr, 2018). The water system was defined as a crucial point that resulted in a new groundwater pump to increase the supply. Later, in 2019, phase two continued with even more developments regarding water supply and wastewater. Most noticeable through this development are the washing machine, the expansion of the water system by the addition of more connections and lastly the improvement of toilet hygiene.

In spring 2019, the method Logical Framework Approach (LFA) was used to define and project the most critical infrastructural challenges. The project team agreed that the most important thing is that the sewage treatment system cannot operate normally, the toilet is unsanitary, the UPS system is lacking, the laboratory space is insufficient, the building is eroded, and the building is leaking due to heavy rain. A big challenge is a budget and time and therefore different parts of development must be prioritized.

Currently, the Reproductive Child Health Service (RCH) is being rebuilt because this is one of the most pressing issues (Rebecca Axelsson, 2019). The earlier construction plan and area were unsuitable for the required function. Now, the new RCH unit will open the area of the expandable laboratory. Currently, the laboratory tests are sent away for investigation and the expansion of the current laboratory would be of major significance. In the long run, this will enable hospital staff to increase the number of patients, thereby reducing mortality.

In spring 2020, the laboratory is currently limited because of the small room areas. The hospital wants to expand its laboratory to be able to make its laboratory tests instead of sending samples to another laboratory. Therefore, having their laboratory, that will increase the chances for faster results. Several of the rooms are used for multiple purposes due to the lack of space. Therefore, we will explain in detail this phase in the chapter "Laboratory extension from the old RCH" as we had done our practical work through this phase. Thus, new rooms with better equipment are necessary to allow the hospital to provide adequate care for the patients.

1.2 Aim

This thesis aims to study the challenges faced by aid project teams in virtual construction projects and on-site project management. By digging deep into this subject, the main goal is to evaluate what key factors to focus on in order to achieve more development collaborations and increase the effectiveness of the teams, thus improving the quality and speed in which are the products created for the beneficiary.

1.3 Research questions

The thesis will strive towards answering the following research question with several sub-questions:

What challenges affect the project team when it is located on a different continent, such as the Mkula Hospital project?

1. How to create trust within a team on-site compared to a virtual team?
2. What role does communication play in the decision-making process in a virtual team?
3. How did the cultural differences influence the Mkula project?

1.4 Thesis outline

In our thesis we divided it into several sections as the methodology, the empirical case study and the supporting literature are presented. This is followed by the analysis part, which will help us to answer the research questions. Finally, the conclusions and recommendations for the future projects are presented.
The outline of the thesis is the following:

• Methodology: The second section which identifies the specifications of the methodology used in this thesis.

• Theoretical part: In the third section, the literature study will present theories on the virtual team framework that describes the challenges of a high-performing virtual team.

• Empirical part: In the fourth section, the Mkula Hospital Project case study will be presented. The main goal of this section is to provide information about important milestones and situations during the project.

• Analysis: In the fifth section, the results of the case study will be combined with the chosen theory to further analyse to the research questions.

• Conclusions and Recommendations: The final chapter will answer the research questions from the study as well as recommendations and thoughts for future research.

1.5 Limitations

The limitations of this study are as follows:

- During the case study, there was not a professional translator presenting during the project. Due to limited English proficiency, this may lead to misunderstandings when interacting with locals.

- Only one project has been conducted and analysed which is the Mkula Hospital Project. Therefore, the conclusions of this study will only be applicable to this aid project.

- During the entire study visit, one of the hospital management team acted as an interpreter. Hence, his perceptions might have affected the result.

- Only one Email was sent to the EWB (Engineers Without Borders) in the whole visit. However, they were a critical part of the project but instead, communication between students and HHPG was done.

- During our stay at Mkula, our main goal was to run with the project tasks as it was only for two months. As a result, events related to research are sometimes not adequately documented.

2 Method

In this section, the methodology used to conduct the research will be explained. Due to the reason that the main source of the data used was the aid work in Mkula hospital, a qualitative study approach was chosen. This approach allows researchers to focus on a specific scenario/case study and observe it, to gather high-quality data (Bickman, 2009). The main approach to collect the data was unstructured observations to record all the events and interactions that were later on used to create a theory and not restricting the research by applying the data to predetermined theory. This means that an inductive approach was chosen where the data was used to determine theory, not the other way around. This approach was chosen due to the reason that we did not have previous experiences with ad projects and could not predict the possible obstacles we might face during our stay. Due to this reason, participant observations were used to gather most of the data that will be later on used to answer the research questions. Additionally, unstructured interviews were conducted with most of the stakeholders spread out through the whole part of the project that we took part in.

2.1 Case study - Mkula Hospital

A case study was chosen for answering the research question to get a deep understanding of a specific project and get high-quality data. This will lead to a better understanding of the situation as Gerring (2019) explains in his book. This is exactly what this report wants to achieve by evaluating the project in Mkula hospital. However, Bickman (2009) suggests that it is very important to have clear goals during the case study otherwise *"you are apt to lose your focus and spend your time and effort doing things that won't contribute to these goals"*. This is why we gather a lot of information during participant observation by taking a lot of notes to not miss any important moment and allow ourselves to analyze the situation later.

The main objective of our two-month-long stays in Mkula was to aid the HMT to finalize the construction of the RCH and prepare the next stage of the project. During the next stage, the laboratory will be reconstructed thus a new laboratory design must be created to satisfy all the stakeholders included in the project. Our role as the student team was to communicate with the HMT to collect their insights on how they imagine the reconstruction and create a new design that fits into the budget of the HHPG. Thus, regular official and unofficial meetings with the HMT (2-4 times per week) were scheduled. Additionally, the HHPG in Sweden was updated by us about the progress at least once a week or if any significant progress was made.

2.1.1 Participant Observation

Participant observation is one of the methods for collecting data and it is described by Kawulich (2005) as "a process enabling researchers to learn about the activities of the people understudy in the natural setting through observing and participating in those activities". This method was chosen because we were able to observe and communicate with the hospital management staff regularly during meetings but also in informal settings. This method was used for decades and identifies 4 roles that an observer can take: complete participant, participant as an observer, observer as a participant, and complete observer (Sauro, 2015).

During the official meetings, we used the advantage of having four members present at the same time. Usually, two people were leading the meeting and communicating with the hospital staff about the development of the project and discussing with them the next steps. Another member of our team was taking notes about the decisions made during the meeting and one was just observing any unusual behaviour. This gave us the advantage to collect as much data as possible. By this, we tried to avoid bias by being overwhelmed with information during the daily meetings. Additionally, we kept a diary where we kept notes about how we felt during any occasion that was worth observing and useful for our research. This approach is described by Kawulich (2005) as two notebook notes. The first notebook is for questions and answers that were discussed during the meeting and the second notebook is for personal experiences. However, as Bryman and Bell (2011) mention, the interviewer can be biased, thus sending a hired interviewer or sending the questions via email can lead to higher quality and validity of the data. In the table below can be seen the table of all points when data was collected during our stay in Mkula.

Week		Monday	Tuesday	Wednesday	Thursday	Friday	Weekend
48-51	Hours	48					
	Activity	Writing Minor Field Study Application in combination with research about Healthy Hospitals Project and case study. Meeting with Project Group Healthy Hospital.					
3	Hours			8	10	4	
	Activity			Preparation Course SIDA (Case Study)	Preparation Course SIDA (Case Study)+brainstorming theory	Preparation Course SIDA (Case Study)	
4	Hours	2					
	Activity	EWB team Meeting Healthy Hospitals. Preparation					
5	Hours		3				
	Activity		EWB team Meeting Healthy Hospitals. Time-plan				
6	Hours	3		3	4	2	4
	Activity	EWB Team Meeting. Update. HMT+project group Meeting and tour at Hospital.		HMT + EWB team Meeting. Time plan. Laboratory. RCH. Revit+Drawing. (1st)	Laboratory. Feedback and detailed visualisation of porejct. Revit+Drawing (2st)	HMT+EWB team Meeting. Laboratory+Drainage system. Revit+Drawing (3st)	Measurements. Double check and understand the building
7	Hours	1	6	1	3	1	8
	Activity	HMT Meeting. Time Plan. Labaotory and RCH. Drainage system drawing.	Student Project Group. Final Drawings (4st)	RCH Check. Demand second payment.	Student Project Group. Preparation. HMT+Engineer meeting. Technical dicussions. Inspection of buildings and infrastructure.	RCH Check.	Student Project Group. Visualisations, Final Drawings+Revit (5st)
8	Hours	6	1	1		1	
	Activity	Student Project Group. Estimation of material	Send info to district engineer. (in cooperation with EWB team & EWB engineer)	RCH Check.		RCH Check.	
9	Hours	1	1		1	1	
	Activity	EWB Team Meeting. Comparison previous project. Project plan.	RCH Check.		RCH Check.	Contact and discussion with district engineer	
10	Hours		2	1	2	1	
	Activity		Student Project Group Meeting. Analysation and contact with solar panel+VVS Company.	RCH Check.	HMT + District Engineer meeting. RCH update. Laboratory + Drainage system. Best solution?	RCH Check.	
11	Hours			1	2	1	
	Activity		Second payment for RCH recived.	RCH Check.	Student Project Group. Solar panels+VVS contact and research.	RCH Check.	
12	Hours	2	2	2	1	1	
	Activity	Student Project Group. Analyse of bill of quantity from district engineer.	Student Project Group. Investigation and company contact.	Student Project Group. Investigation and company contact. EWB Team Meeting. Money and Construction.	EWB team meeting. Contact with HMT and district engineer regarding price reduction.	Kolandoto Hospital Study Visit	
13	Hours	1	2	3			
	Activity	HMT Meeting + district engineer.	EWB team Meeting. Reduction of price. Quality and construction discussion.	Final HMT Meeting. Finalize RCH. Laboratory to expensive -> will wait. Cooperation will continue.			

EWB Project team
Student Project Group
Hospital Management Team (HMT)
District Engineer
Contractors

Figure 1 Overview of the data collection points during the case study in Mkula (Strålman & Blanksvärd, 2020)

2.1.2 Project structure

After the HHPG's introductory week at Mkula Hospital, the students, the Hospital Management Team, and the Healthy Hospital Project Group collaborated to improve the Mkula Hospitals healthcare after their requests and needs by reconstructing a new laboratory design for the benefit of the hospital. For spring 2020, the students were divided in two groups. Two master students and two bachelor students were staying in Mkula village for 8 weeks to supervise the construction work and keep track of any updates and improvements necessary in the future.

As students, we arrived at Mkula in February with the company of three members from the HHPG (two engineers and one architect). However, the members from HHPG stayed with us the first week to introduce us to the HMT and to set the foundations and goals for the rest of the 7 weeks. Then, the HHPG helped us with the design of the laboratory as one of them is an architect and to share their knowledge and experience with us. With the help of the students, HHPG also applied for a donation ship and funds. During the Mkula hospital case study, the students acted as the main connection between the HHPG and the HMT. Students could make few decisions with the HMT, but in decisions for larger sums of money, the HHPG had to be considered as well.

The main stakeholders involved in the Mkula hospital project were the HMT, the HHPG, and the students. In addition to the three main participants, donors and local participants are also involved. The contact with donors was held by the HHPG and the students. We also got in touch with local actors together with HMT. In Figure 2 you can see the structure of the project, which involves all participants, and also shows who is in Tanzania and who is in Sweden.

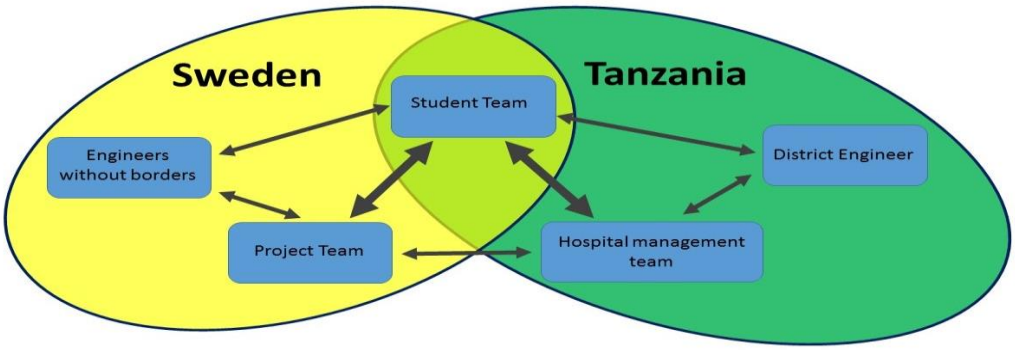

Figure 2 Project structure of the Mkula Hospital Project - communication streams.

2.1.3 Stakeholders

During the project, multiple stakeholders were involved. The form and extent of our communication, the frequency of our meetings with them, and the kind of information transferred differed between each stakeholder. The stakeholders range from the ones present in Mkula (Hospital management team, student team, etc.), the ones coming to the building site (district engineer), to the ones situated in Sweden (Project team and EWB). Therefore, one of our tasks was to sustain the communication between the

stakeholders and make sure each of them has the information that they need. The project's current phase is a part of an ongoing partnership between the HHPG and the HMT. The partnership began in the fall of 2017 with a visit from a few members of the HHPG to assess the changes that are required at Mkula hospital. Also, the HHPG was trying to establish a connection between the hospital management team and the students. A summary is shown in Table 1. Of the key players involved in the Mkula Hospital Project's 2020 process this year, along with an overview of their contribution to the project. During this case study, these characters were observed at various times, and they all had a hand in the result. However, some had a greater effect than others, according to the case study.

Table 1 Stakeholder description

Stakeholder	**Details**
Hospital management team	The whole management running the hospital
Head of the hospital (a senior doctor)	Director of the hospital
Hospital Doctor/Construction supervisor	One of two doctors in the hospital that overlooks the construction projects
Hospital Accountant/Secretary	The person in charge of organizing meetings and has access to the bank account of the hospital
District engineer	The engineer that overlooks and is responsible for all the construction projects in the Busega region
Student team	Two Swedish bachelor students and two international master students staying in the village for 8 weeks
Healthy Hospitals Project Group	The team is located in Sweden in charge of the Mkula hospital project consisting of four engineers and two architects
Project leader	The person making all the important decisions in the HHPT
Rainwater engineer	The engineer from EWB located in Sweden assigned to help us with the rainwater system
EWB Sweden	A non-profit organization working globally on sustainable development goals

2.1.3.1 Student Team

This year we traveled as four students at the same time for 8 weeks starting from February and lasted till the end of April then the COVID 19 forced us to leave earlier than we planned to stay in Tanzania. Unlike the previous year, two groups of master

students overlapped that year, extending the project's duration from eight to fourteen weeks. We divided ourselves into two groups, the master students' group and the bachelor students' group to split the tasks according to each one's thesis requirements. For instance, as master students our main tasks was supervising the on-going RCH construction project and keeping track of the projects´ progress, helping the bachelor students with the design of the new laboratory, estimating the quantities for the new lab using the AutoCAD, revising the costs made by the district engineer and negotiating the prices of the materials with him. Lastly, we were responsible for the rainwater management system design and measuring the accurate dimensions in the village to make a proper design as well as contacting the rainwater engineer about if our design is correct or not. Regarding the bachelor students, they were responsible for the design of the new laboratory using REVIT and AutoCAD. One of them was responsible for sending emails to all main actors in the project such as HHPG members, HMT members, district engineers, and donor-ships. The other one was responsible to make the project plan and an update report (see APPENDIX 2) as well as handling the minutes of meetings during our formal and informal meetings with the HMT.

We had official meetings two or three times per week with the HMT but sometimes it differed. For example, we had 5 meetings in the first week since we were with the HHPG to introduce us to the HMT and the project. Moreover, every two days, we had to keep track of the RCH construction progress. Also, it is good to mention that we had unofficial daily meetings when we met the locals in the hospital, market or they came to our house and in this way, we built a bond of trust between us and the HMT. Lastly, one of the doctors in the HMT used to send messages over the phone to check up and get information when we were out of the village.

2.1.3.2 HHPG (Healthy Hospital Project Group) also named as Project Team

HHPG was created by two engineers who have been organizing projects in Tanzanian hospitals since 2015, and they began work on the Mkula Hospital project after finishing previous work at Kolandoto Hospital, another AICT hospital. The team is currently made up of four engineers and two architects. We, the students, are not part of the HHPG's core party. Rather, we divided the students into groups for the project. The two engineers in the management group participated in the aid work at Kolandoto Hospital in 2015 as a part of their master thesis and the other two engineers participated in the Mkula hospital project in Spring 2019. In 2018, one of the architects completed her master's thesis at Mkula Hospital, and the other architect has similar experience in Tanzania, but with a different project. One of the engineers who is a member of the HHPG is informally in charge of it, who is the project manager for the Mkula hospital project, and he is also in charge of the contact with the HMT.
Before departure, we have met the HHPG in a couple of formal meetings to get information about the project and to provide us with the project plan (See APPENDIX 2). We also had casual get-togethers to get to know one another and reinforce community bonds. During the project in Tanzania, communication was done through phone calls with the project manager and the whole team and weekly updates via messenger. Both representatives of the HHPG were involved in broader decisions, but when we needed professional guidance, we only contacted the Project Manager.
Documents, sketches, and contracts, on the other hand, were submitted to the whole group for feedback. Throughout this process of the project, contact was ongoing, and it was mostly possible to contact them whenever to get help through the project.

2.1.3.3 Donors and Funds

The Mkula Hospital Project would not have been possible without the help of the project's donors and collaborators. Since the start of the Mkula Hospital project, Table 2 lists the donors involved in each process and the form of funding. Since its establishment, HHPG has been a member of Engineers Without Borders (EWB). HHPG is an independent operating group within EWB, and it has no obligations other than giving updates on the ongoing project.

Table 2 Donors in Mkula Hospital Project. (Annika & Ellen, 2019)

Donor	**Form of support**
ARQ	Project funding
Chalmers MasterCard	Project funding
RISE	Project funding
WSP	Project funding
Engineers Without Borders	Partners
MFS - Sida	Scholarship for Swedish students

In addition to donors who funded the project, two bachelor Swedish students got accepted to scholarships to pay for the flights and accommodations in Mkula. Unlikely, the international students did not receive any source of scholarship due to the COVID 19 issues as the scholarships were cancelled. The MFS-SIDA scholarship provides a preparatory course for the two bachelor's degree students, in which students gain the knowledge to conduct case studies.

2.1.3.4 District Engineer and Contractor

In this project, all actors engaged in construction work or installations are local actors in Tanzania. This fact was chosen and approved by HMT due to three reasons: the benefit of working with people familiar with the local context and construction regulations for building hospitals, the willingness to support local workers, and the need of cooperating with actors who could communicate well with the HMT. At this stage of the project, there are two local participants involved. This includes a local contractor who was hired to build the new RCH building and will be hired to build a new laboratory. While the district engineer was contacted for supervising the new RCH building, estimating the costs for the new laboratory, discussing the design of the rainwater management system, and will be supervising the construction of the new laboratory. The main reason behind this decision was that he is familiar with the construction regulations and construction law within the Busega region.

2.1.3.5 Hospital Management Team (HMT)

The Mkula Hospital HMT is involved in all major hospital decisions, and all work at the hospital is supervised by them. The team is consisted of seven members including

two doctors, *the head of the hospita*l, *a hospital doctor or construction supervisor*, a hospital accountant, and a health secretary.

When we arrived, the HHPG introduced us to the HMT members. First, we met the *head of the hospital* then we met the other members from the HMT. During our stay in Mkula, *the hospital doctor was* available for us, and he was the one we had the most contact with every day as well as taking care of us throughout the whole stay which had a significant impact upon trust between the students and him. In addition, he has more influence in decision-making and prioritization than the others in the group. However, when signing official contracts and documents, it was the head of the hospital's responsibility. The hospital doctor was in charge of all technical problems at the hospital, so he was the source of a lot of technical knowledge. He attended almost all of our meetings with the HMT and the district engineer.
The hospital doctor had worked at Mkula Hospital since its inception and had extensive knowledge of the hospital's technological structures. Since he spoke English better than the rest of the HMT, it was easier to talk to him. Finally, the information he provided was very useful for the project.

2.2 Literature study

The second part of this report will consist of a literature review to compare the experiences and observations from the case study to existing theories and models to conclude. Eriksson and Kovalainen (2016) say that literature research (analyses of existing reports, journals, published books, etc.) is a must to research, understand and develop ideas. Eriksson and Kovalainen (2016) continue that *"the purpose of the literature review is to explore, summarize, compare and critically analyze what has been written by other researchers about the topic".* Therefore, the literature review will be used to analyze and explain our findings from the case study. The theories and models from the literature will give us a deeper understanding of the research topic and help us to answer the research questions.

2.3 Ethics

During the research done in Mkula village, several ethical aspects had to be taken into consideration. Because the main strategy of collecting data is observing the interactions of the hospital team and us, it was important to inform them about the research and to let them know they were studied. On the other hand, informing them about being studied could influence their behavior and hinder the data collected. Nevertheless, the decision has been made to not offend them by withdrawing information from them. Additionally, no names will be stated in the thesis, only the positions of the people to keep the report anonymous.

Additionally, the cultural differences could have been significant. Therefore, before going for the study visit, research was made about the culture in Tanzania. The advantage was that the hospital management team was used to cooperation with Europeans because the Healthy Hospitals project is already running for several years and every year a team is sent to Mkula. Thus, the hospital team already learned that the behavior of Tanzanian and European people can be different. Thanks to this they are more understanding and forgiving when something unusual happens.

3 Theoretical Study

In this chapter, the theory used for the thesis will be presented to later analyze the findings of the empirical study. The first section will introduce the aid project teams, their structure, and how they operate. Secondly, the virtual team framework will be presented that describes the challenges of a high-performing virtual team, that was introduced by Lumseyfai (2019). This followed by explaining the 5 main characteristics of this framework which are technology integration, management of virtual resources, project governance controls, stakeholder engagement, and organizational drivers. Through explaining the characteristics of the framework, three main challenges that face virtual teams will be presented. These three main challenges are trust, communication between stakeholders, and cultural differences. The aim of the theoretical study was to provide data which can be used to answer the questions stated in chapter 1.

3.1 Aid project teams

Aid projects are often connected to non-profit organizations that generally do not produce any profit themselves but rely on donations, gifts, or grants from a third party (Anheier, 2014). Anheier (2014) continues to argue that this is a contrast to business firms that try to generate income by charging the customers a price. However, during the aid projects, the money from the donors is spent on a chosen project, when a chosen goal (something is built or repaired when considering the construction projects) was reached without the helped person/organization needing to pay back the money.

After the non-profit organization chooses a goal and collects enough money to finance the project, then it must assure the money will be well spent and the project will run smoothly even though it can be on the other side of the world. Therefore, usually, a team is sent to overlook the execution of the project to make sure everything runs smoothly and it is completed successfully. This is the point when the team on the mission must be able to work independently, as the communication with the rest of the team in their original country can be unstable. Thus, the team on mission works as a traditional project team, however, the whole organization becomes virtual due to the need for updates about the development of the project (Anheier, 2014).

3.1.1 Multicultural teams

Since the aid projects are usually sponsored by an organization from another country than where the project is taking place, it is advantageous to also have a multicultural project team to improve the productivity of the team, especially the decision making (Shachaf, 2008). Multicultural teams can be defined as a team where “members represent three or more ethnic backgrounds” (Sembdner, 2011). However, even when a team is multicultural when it is sent to a new unknown country, the team can be faced with completely different challenges. One of them can be the “cultural trap” when the locals do not commit to the project and see the result as a donation instead of connecting with the project and trying to make it as good as possible (Ika, 2012). Therefore, it is important to make sure that the locals commit to the project to teach them how to use the donated gift (whatever it may be) to the full potential and to maintain it properly, so they can use it as long as possible. Consequently, having a multicultural team can improve the communication between the locals and the team members, as the team is

already used to communicating with people from different cultures. Lee & Kim (2020) also concluded that good communication is directly related to successful team performance.

3.1.2 Trust

Since we are talking about aid projects, it is important to know that Swedish development cooperation with Tanzania aims to contribute to conditions for sustainable growth in Tanzania and provide those who are living in poverty with better opportunities to help them by obtaining work or starting the productive business especially in the construction industry (Development Cooperation with Tanzania, 2013). According to Lechler (1998), trust that is practiced in the construction aid projects is almost related to the actions of the project members who interact as a project team to achieve the project goals. Since Tanzania is one of the countries with high rates of poverty, it will be difficult to create trust among the people over there. Thus, the issue of trust is very important for solving important issues in delivery construction (Gad and Shane, 2014).

According to Challender, Farrell, & McDermott (2019), the construction industry has been characterized by its complex processes and exchanges of information and that is a big factor for creating a lack of trust among the stakeholders. To overcome this problem, Schwalbe (2004) suggested that creating a risk management plan for the construction aid projects would be the best to overcome the lack of trust between stakeholders as contextual variables of risk, vulnerability, and uncertainty are crucial in terms of the trust. Thus, creating a risk management plan will be an effort to mitigate issues and risks that could be caused by the lack of trust (Gad and Shane, 2014).

3.2 High-performing virtual team framework

Virtual teams can be found in practical life through various fields of engineering such as mechanical engineering, industrial engineering, and lastly construction/civil engineering (Lumseyfai, 2019). Besides, virtual teams are increasingly occurring in the construction industry. As construction companies and projects take advantage of international, interdisciplinary, and multi-organizational partnerships, communication alternatives should also be expanded to be more effective. However, misunderstandings and little guidance are obstacles to the successful completion of virtual team management (Chinowsky & Rojas, 2003). Hence, having successful virtual teams will provide cultural awareness, increase global collaboration, improve work productivity, reduce project costs and enhance flexibility for the employees (Lumseyfai, 2019).

According to Lumseyfai (2019), engineering companies continue to move to adopt virtual teams more than using normal teams where face-to-face communication is possible. Unlike co-located teams, virtual teams require working across time zones, space and cultural boundaries with links strengthened utilizing the advanced technologies nowadays (Sembdner, 2011). Furthermore, engineering firms which are using virtual teams require involving people from different disciplines, locations, functions, concepts, and cultural backgrounds to work together on specific projects (Pinjani & Palvia, 2013). Thus, virtual teams face unique challenges compared to co-located teams and require additional quality leadership, which is essential for a virtual

team to improve efficiency and productivity for the benefit of the organizations (Derosa & Lepsinger, 2010).

According to Lumseyfai (2019), virtual teams face challenges including, coordinating tasks, motivating team members, and building relationships and team cohesion. However, according to Pinjani & Palvia (2013), lack of trust between the members, communication among stakeholders, and cultural differences are the three main challenges that are caused by distance and time zones. Furthermore, Pinjani & Palvia (2013) continues to argue that recent research highlights that the relationship between trust, communication, and cultural differences is crucial as it fosters team effectiveness and productivity. However, virtual teams will face significant difficulty in achieving such a relationship. As the successful execution of virtual teams has attracted more and more attention from the design and construction world, the framework has yielded five themes, as shown in figure 3 to enable high-performing virtual teams: technology integration, management of virtual resources, project governance controls, stakeholder engagement, and organizational drivers (Lumseyfai, 2019).

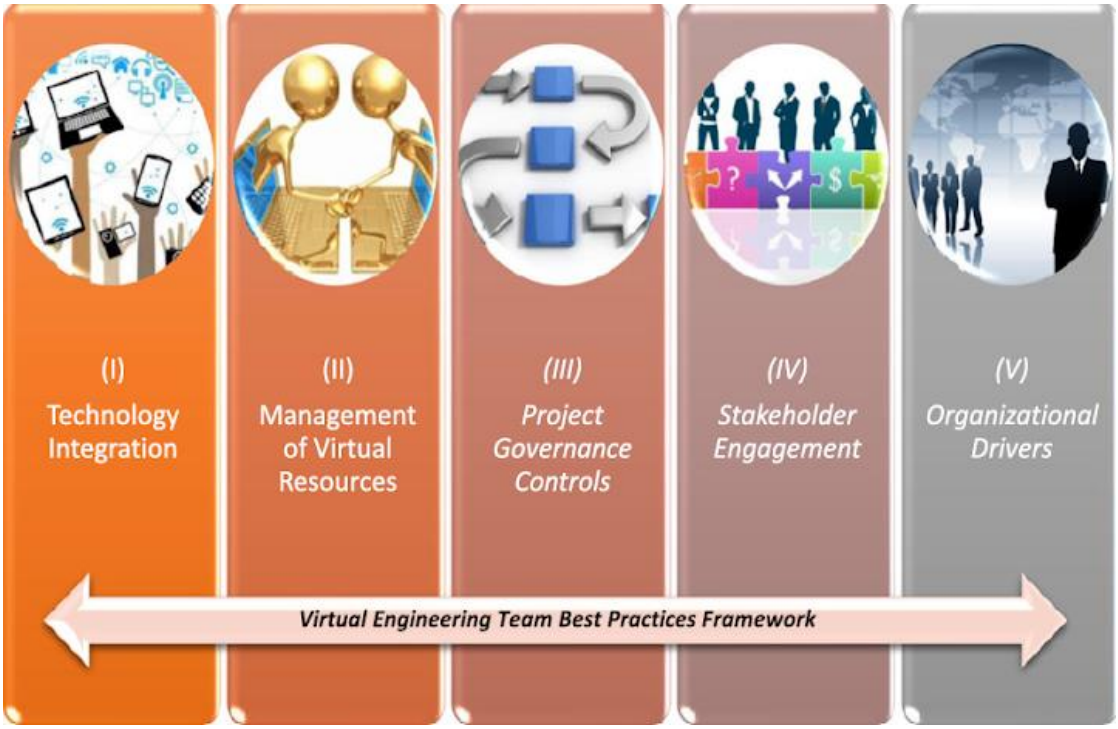

Figure 3: High-performing virtual team framework (Lumseyfai, 2019).

3.2.1 Technology integration

The first theme of the high-performing virtual team framework is called technology integration. It describes the need for virtual teams to use technology to increase productivity as it decreases the gap between virtual teams and traditional teams with the possibility to have face-to-face meetings (Lumseyfai, 2019). Technology does not only allow the team members to communicate but also to transfer information and create relationships according to Derosa and Lepsinger (2010).

Regarding communication in a virtual team, the team members have multiple options depending on what is the content and purpose of the communication. However, Dyer, et al. (2013) emphasizes that "they (team members) must also know when a particular

communication technology is appropriate for a particular task". When the team members want to share documents, schedules, or simple files, sending them by email is sufficient compared to other more complicated methods. However, Lepsinger (2010) emphasizes that "email communications should be clear and succinct". This is supported by more recent research by Wen, et al. (2019) in which they conclude that to be a high-performing individual one should "use more positive and complex language, with low emotionality, but rich in influential words" in the emails. Additionally, Shachaf (2008) claims that in a multicultural team, communication through email reduces misunderstandings. The next level is when a conversation is needed to share a complicated message that needs more explaining that would be appropriate to write in an email. For this occasion, a phone or conference call is a better option. However, from a call, no written notes are saved unless one of the callers is taking them. This is a small disadvantage compared to emails that can be saved and one can return to them later. However, when the team members want to brainstorm or discuss possibilities of how to move the project forward a medium with more possibilities to interact and share more information is needed (Dyer, et al., 2013). Therefore, video conferences are the best option here where people can visualize their ideas and sees the facial expressions and enthusiasm of the other team members. Therefore, software like zoom, skype, or google is preferable. They have a high amount of information to be transferred during the communication, but it can be very time-consuming, so it has to be used wisely.

On the other hand, the rules and use of the technology have to be easy and done in a way as the team members do not spend a significant part of their working time communicating with the rest of the team. Thus, only a few communication methods should be chosen to not overwhelm the team members. Lepsinger (2010) called this phenomenon "technology overkill" and it leads to lower productivity of the team. Additionally, the team members should always come to the meetings prepared, to keep the meeting productive (Dyer, 2013).

However, to be able to use the advantages of the technology and use its full potential, one must have access and knowledge of how to use it. Even though almost everyone in Europe has access to computers and the internet, and the whole project management is built around this technology, in Africa there is a lack of technology and thus the approach to project governance must be changed (Ika, 2012).

3.2.2 Management of virtual resources

As mentioned above, the introduction of using technologies through virtual teams can be viewed by many organizations and individuals as a technical implementation, which is like introducing new software or hardware into a construction company. A combination of technical and managerial responses is required to achieve successful virtual teams (Chinowsky & Rojas, 2003). According to Lumseyfai (2019), certain levels of trust and successful communication need to be granted between the team members to manage their time efficiently and effectively. This can be done by creating virtual meetings so every member can communicate through the team. Beyond that, trust and communication are critical key success factors that are needed between team members and their peers to deliver the tasks on the planned delivery date. Therefore, lack of attention to trust or communication will affect the management responsibilities of the virtual team. This lack can result in cost overruns, late delivery tasks, and failure to produce a successful project solution (Chinowsky & Rojas, 2003).

Leadership focuses on motivation, trust, the participation of team members, enhanced relationships, and collaboration, which are essential for managing a successful virtual team (Lumseyfai, 2019). Moreover, leaders need to provide a safe environment based on trust between team members to make them feel comfortable raising issues and sharing feedback. According to Chinowsky & Rojas (2003), it is considered an advantage that each member in the virtual team is working independently towards achieving a main and common goal. However, this idea could also be a potential risk for virtual teams. For instance, team members who are working on a specific part of a project are separated geographically from other members of the team. This issue can create misunderstandings, change or lose focus on the overall objectives and tasks of the project (Chinowsky & Rojas, 2003). Thus, to maximize the success of the virtual teams, leaders should manage the attention to create trust and develop communication relationships between team members.

According to Chinowsky & Rojas (2003), trust and communication between stakeholders are extremely important to be implemented in virtual teams in construction projects. The complexity, the size, the risks are only a few issues that make the project difficult for the project manager. However, this difficulty can be exaggerated if the team members have not established a trust relationship. For example, in virtual teams, team members are separated which makes it more difficult to set up face-to-face relationships in personal relationships which trust is often built on. Thus, Lumseyfai (2019), the following techniques are examples that align with this management approach: set up one to one meetings, engage team members to ask questions on virtual calls, share feedback in person with the team members, motivate team members to explore new solutions and enable team members to update the project progress. Hence, these techniques will reduce conflicts between team members and increase the trust and communication related to achieve a successful managerial virtual team.

3.2.3 Project governance controls

Project governance controls are defined by Lumseyfai (2019) as "practices and feedback controls for ensuring proper coordination, tracking, and communication throughout the life cycle of the project". Therefore, planning and setting up good communication ways and practices within the team can be crucial to keep the project running smoothly. This must also include a way for the team members to communicate informally, which will consequently lead to an improvement in communication and relationships between the team members (Leipsinger, 2010).

An additional part of the project governance controls can be risk management, scope change, or team coordination. In the risk management controls, all risks are identified at the planning stage of the project and steps of how to mitigate them. Therefore, team members will have easy access to a guide on how to quickly deal with risk events (PMBOK 6th Edition, 2017). Part of the scope change controls could process that clearly state the process of changing or adding new requirements. These steps will include the integration of the new requirement into the project, risk analyses, additional cost estimation, etc. Lastly, team coordination is about being able to follow the progress of individual members. This includes the communication about the updates as well as sharing the new product with the team members that are interested and need to see the

progress. However, even when all of these controls are set up, they must be re-examined over time (Lepsinger, 2010).

3.2.4 Stakeholder engagement

According to Lumseyfai (2019), since virtual teams restrict face-to-face interaction between team members, this restriction will affect the interaction between stakeholders. As consistent stakeholder engagement can have benefits in virtual teams' projects. For instance, if there were misinterpretations and misunderstandings in stakeholders' virtual meetings, the virtual team will lead to an incorrect path and wrong solutions as well due to lack of face-to-face interactions and feedback. Therefore, this restriction will have an adverse effect on virtual team members, because virtual team members will feel separated from work and team members, so their productivity or satisfaction is low (Berry, 2011).

Shachaf (2008) pointed out that cultural differences are the main factor for the successful participation of stakeholders. If miscommunication is caused by cultural or language differences, trust and coherence between stakeholders will be affected as well. Moreover, the virtual project team needs to provide clear direction and clear expectations for each stakeholder in the group. Due to the lack of clear instructions, stakeholders will not be able to participate through virtual teams (Chinowsky & Rojas, 2003). Hence, the failure of stakeholder participation will affect the internal costs of the project and require team members to invest more time and energy to understand each other.

According to Lumseyfai (2019), the following practices are considered as examples to ensure how to set up strong stakeholder participation and enhance stakeholder capabilities in virtual construction projects. Firstly, stakeholder representation, which performs stakeholder analysis at the planning phase of the project to make sure that all the stakeholders are represented. Secondly, face-to-face kick-off meetings are established to provide key members of the project with opportunities for stakeholder participation and introduction. Thirdly, the success goal is to collect success criteria from key stakeholders at the beginning of the project to establish clear goals. Finally, the report output as a stakeholder may be busy and unable to participate in every meeting, so sharing the report output on the regular basis to ensure the visibility of the team's progress.

3.2.5 Organizational drivers

According to Lumseyfai (2019), organizational drivers in a virtual organization could be divided into three parts, executive leadership support, technical maturity, and recognition and reward system.

Executive leadership support can be crucial for running a virtual team as team members must know who to approach when a decision has to be made. This can relate to the funding of the project, the direction in which is the project going, etc. According to Casey (2006), senior management support is essential for the long-term success of a virtual organization, therefore, the goals of a project must be aligned with the organizational goals.

Secondly, the technical maturity of an organization depends on the level of technology that is implemented. As mentioned above, technology is very important in virtual teams for communication, knowledge and information transfer, etc. Therefore, if the use of the technology is well established in the organization, the capabilities of such an organization are increasing (Lumseyfai, 2019). However, having a well-established use of technology can support short-term success, but if an organization wants to be successful in the long-term, investments must be made to improve not only the technology used within the organization but also the capabilities of the employees to work with the technology. Additionally, the employees should always be involved in the decision of what kind of technology is gonna be used during a project as they are gonna be more comfortable in using it. This will lead to higher quality outcomes, than if they would be forced to work with technology they are not familiar with or do not think is the best for the current project. This is much easier in smaller companies (like the HHPG), so even the people at the lowest level of the hierarchy have a say in what kind of technology is the most suitable. However, in organizations such as Engineers without Borders, the habits of what and how things are done are already rooted deeply in the organizational structure and one has to just follow them. Therefore, communication between the top management and the employees can dramatically influence the project. Moreover, knowledge management is also included in the technical maturity of an organization, as the knowledge transfer and sharing happens in virtual teams over a long distance, hence, technology needs to be used. Thus, the use of correct technology to transfer the previously learned knowledge in the last projects or creating internal databases can be beneficial for a project (Lumseyfai, 2019).

Lastly, when the team members are separated over long distances, it is important to create a system for rewarding the employees for the work done. The team members must feel that their work was appreciated, and a reward is a good way to positively motivate the employees to work hard even in the next projects (Lumseyfai, 2019). However, the reward can be given either to the individuals or to the whole team. Hertel, Konradt, & Orlikowski (2004) argue that team-based rewards are more beneficial for the whole corporation as they show the team members (that do not have to be at one location) that their collective work was appreciated and it will motivate them to cooperate closely even in the upcoming projects. Therefore, team-based rewards support team productivity more than individual rewards, which could lead to the point when team members do not communicate with each other and just focus on their parts of the project, just to get a high reward at the end.

4 Empirical study - Healthy Hospitals Project

In this chapter, the empirical study of this thesis will be described. The study was made in Mkula village in Tanzania where we have spent 8 weeks working with the hospital management team on several sub-projects. The Hospital is located on the edge of Mkula Village. Additionally, the hospital has only 2 doctors certified to conduct surgeries and the capacity is currently 105 beds with separate wards for men and women. The hospital is part of the African inland Church Tanzania (AICT) which is an organization that supports both individual people as well as communities spiritually but also physically. Additionally, the AICT owns several hospitals in Tanzania. Mkula Hospital is located right next to the main road in the village, which makes it very accessible and easily locatable for the patients. During our stay, we focused on the hospital area, but we got a chance to visit nursery school, which is located right next to the hospital. Lastly, thanks to the communication with the locals living in the village we got to understand how they are living and what difficulties they are facing daily. For example, there are no houses in the village with running water (except for the hospital buildings and few houses owned by the hospital), which makes hygiene difficult. The locals must walk to the hospital where they can get water that they can use in their houses.

In the last couple of years, the HHPG worked on implementing crucial upgrades to the system that improved the running of the hospital significantly. After the HHP started the autonomous power generator was installed that starts automatically when the electricity is out and powers the whole hospital area. Additionally, the water tower was fixed to make sure the hospital can store enough water during the rainy season and store it for the dry season. Moreover, several septic tanks were repaired as toilets in the wards were reconstructed and sufficient plumbing and sufficient outlet of the waste material had to be guaranteed. Lastly, the design for the RCH building was made last year and the construction started in November 2019.

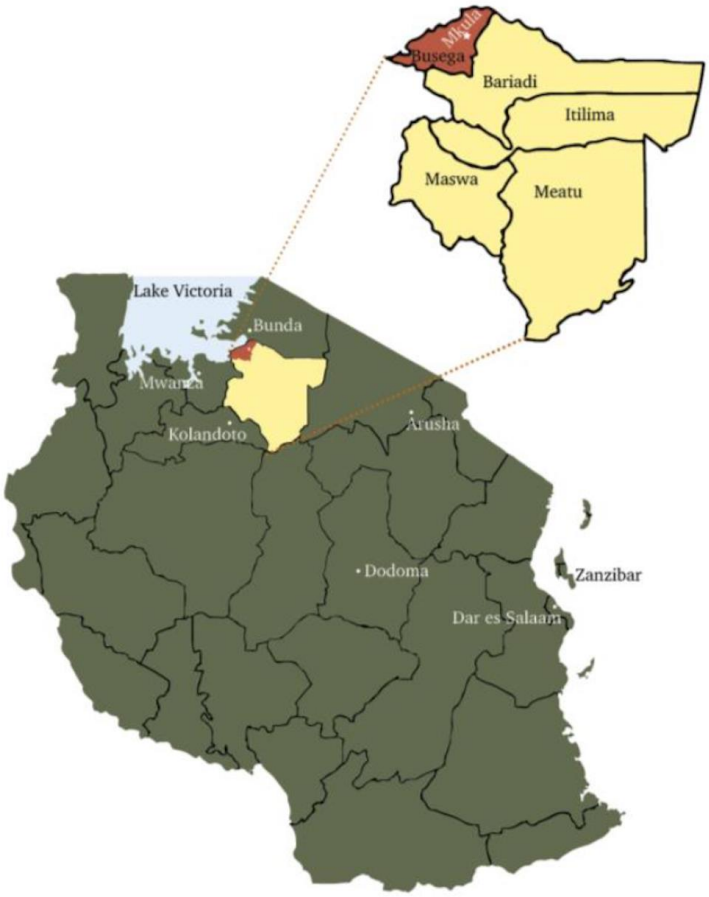

Figure 4 Location of Busega district (red) and Mkula within Simiya region (red and yellow areas) and Tanzania (Kullberg, 2018).

During the stay in Mkula, the primary focus was on supervising the construction of the RCH building that was already in the last stage and was planned to be finished during our stay there. The secondary focus during our stay was to finish the design of the reconstruction of the laboratory that was started last year. Lastly, we were ready to assist and help the hospital management team with any other issues that they will come up with or that we will observe. One of these challenges that occurred was the rainwater system to lower the amount of rainwater that runs through the hospital area and causes damages to the current buildings.

In figure 5, the hospital site plan can be seen where the land owned by the hospital is within the dotted line. Most of the buildings are located in the south half of the property. Therefore, this leaves almost half of the property for greenfield development. The location of the RCH and laboratory project is highlighted there.

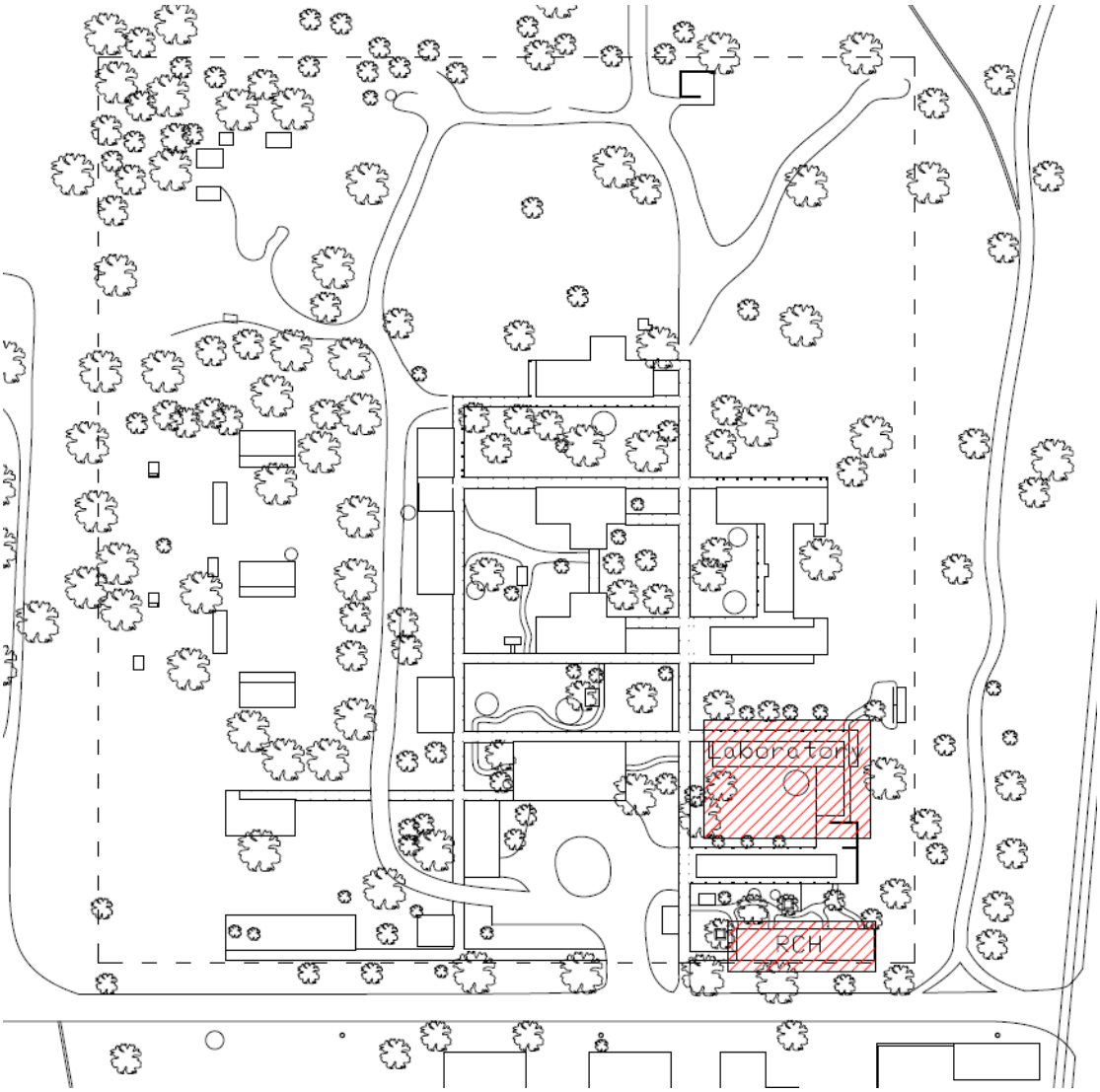

Figure 5 Mkula Hospital site plan

4.1 RCH construction

As stated above, one of the main objectives during the stay in Mkula was to supervise the construction of the RCH building, which the floorplan can be seen in figure 6. The supervision ranged from solving technical problems, checking if they are building according to the drawings, making sure they have sufficient funds to pay for material and workers, or checking if they are within the agreed budget. This was done by regular visits to the building site, having formal and informal meetings with the whole hospital management team, or with just specific members depending on the importance of the issue that had to be discussed.

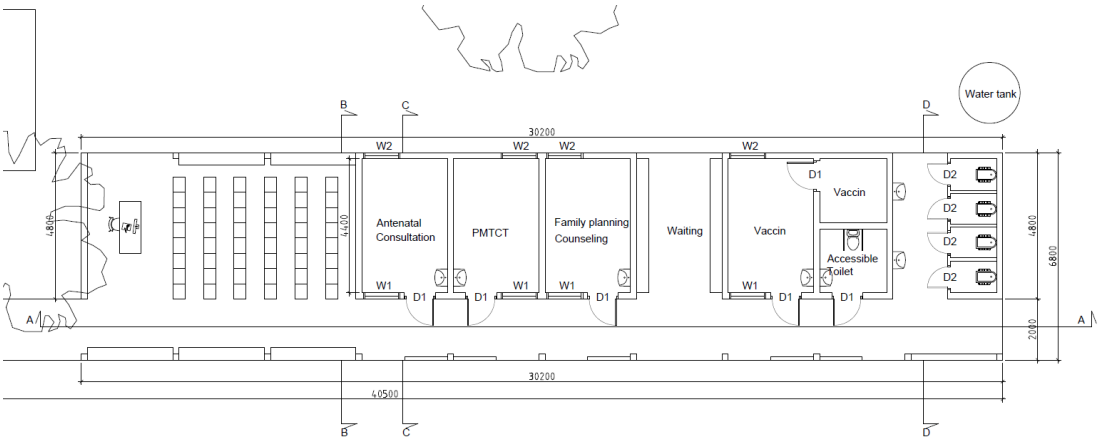

Figure 6 RCH - floor plan

Upon our arrival to the village, the construction was already going for several months and the foundation and load-bearing walls were already finished as can be seen in figure 7. Therefore, the next steps were to start the construction of the wooden trusses for the roof, cover the pathway leading to the building to protect the patients from the rain, install the window and doors, etc. During this procedure, we were able to observe the way the construction phase is handled in Tanzania.

Figure 7: RCH construction site upon arrival to Mkula

During this stage, several occasions occurred when a mistake or a decision was made to construct a specific part of the building in a way that did not look the most efficient to us. For example, upon our arrival, the first thing we noticed was that the construction workers did not place the sewage pipes in the toilets before casting the foundation. Therefore, they will have to drill the holes to place the pipes later on in the construction that will take more time and resources. However, even though this mistake was noticed, the concrete was already hardened so there was no way to fix it. It was not sure if it was an honest mistake, regular approach how to build, or if it was just away from the contractor how to increase the costs of the construction and earn more money. Nevertheless, there was nothing that could have been done, so we just informed the HMT and the HHPG in Sweden about the issue. Additionally, in the next stage, the columns were made by casting concrete into a wooden framework. However, after they left the concrete to harden for several days and took the framework off, they found out that air bubbles were created in the concrete, which was in some cases so deep that they exposed the reinforcement. Both, our team as well as the HMT found this flaw, which had to be addressed immediately. Therefore, the HMT reached out to us for our opinion on what is the correct action to fix this problem. The HMT wanted to know if covering the areas that were not filled by the concrete will fix the problem, or if they would, unfortunately, have to demolish the columns and start again. From the observation, our

student team agreed that covering the exposed parts with mortar will solve the problem as the column still held enough load-bearing capacity to support the roof. This conclusion was reached also by the HHPG in Sweden after we sent them several pictures of the critical areas. Therefore, covering the exposed reinforcement worked only to protect them from air and moisture and prevent them from corrosion. This solution was applied and the problem was fixed.

Due to mistakes like the ones mentioned above and several others, the delivery date was getting postponed. Upon our arrival, we were informed by the HMT that the RCH building will be finished before our student team leaves the village (in two months). However, EWB changed the procedures by which the project team sends money to the HMT. The total amount of money that the HMT was supposed to receive was divided into three instalments. The first one (40%) was sent before the construction began for the hospital to have finances to begin the construction and pay for the building material and labor costs. The second payment (30%) was planned to be sent during the construction when we see the hospital is making progress and the final payment (30%) after finishing the construction. Therefore, the first payment was already received and during the first week of our stay, the HMT informed us that they require the second payment to pay the construction workers (they are paid weekly). Usually, the transfer takes two weeks because it has to go through several international banks. However, EWB introduced new procedures that required the project team to inform EWB about the payments and they had to be approved. However, this adds another week as the responsible person from EWB works only one day per week. Therefore, everybody was counting on that the payment would take two weeks to be transferred, however, the HMT did not inform us earlier about the need for the second payment. Consequently, the HMT ran out of money and could not pay the construction workers. Thus the construction had to be paused until the payment arrived. This postponed the delivery date by more than a week due to new required procedures by the EWB that nobody could foresee. This shows that mistakes were not made only on the side of the HMT but also on our side.

However, the working schedules on the construction were unusual and inconsistent. During several weeks we noticed that the workers were on the building site from 8 AM until 9 PM (except on Sunday when most of the village goes to church). However, then there were weeks when nothing was happening on the building site even though the HMT has sufficient finances to keep the construction going. After talking to the HMT we found out two reasons for this inactivity. Firstly, sometimes the material delivery was delayed and the workers did not have material to work with. Secondly, and this occurred multiple times, every finalized stage of the construction had to be checked and approved by the local district engineer. However, as mentioned above, he had to oversee all constructions in the whole district so meetings with him had to be scheduled ahead and even then we could still get delayed or called somewhere where he is needed more. For example, once he was supposed to come and discuss with us a few changes we wanted to make. However, the minister of infrastructure unexpectedly came to Mwanza to check on the big construction projects and discuss plans for the future. Therefore, the district engineer had to attend that meeting and our meeting with him had to be delayed until next week. Small changes in plans like this were causing that even during our departure from the village the RCH still was not finished (as can be seen in figure 8).

Figure 8 RCH just days before departure of the student team

4.2 Rainwater system design

The hospital area is placed on a hill that was estimated to have a slope of 8 %. During the rainy season, the water is running through the village and hospital areas. The heavy flow is causing leakage into the buildings, especially into the theatre. Besides, the water is causing erosion on the facades and the ground as shown in figure 9.

Figure 9 Erosion due to heavy rain outside the toilet between the pediatric and female ward.

To lead the water through the hospital area, there are tunnels installed through the pathways and ditches. These tunnels are often blocked with sand that is brought there with the surface water. Also, the concentrated water flow that flows through the tunnels has created large erosion on the ground. Furthermore, this issue has led to the showing of water pipes according to figure 9. Furthermore, the rainwater which is coming from the roof is not firmly collected due to the condition and construction of gutters. Thus, to make a sustainable process of collecting water, gutters need to be replaced or at least maintained. The gutters are not as crucial as the drainage system but are mapped out. If the opportunity appears and the budget will allow it, the gutters will be prioritized. Some of the buildings have been affected by the massive water flow due to the loss of material around the foundation. Backfilling could be a solution for maintenance which has been observed and discussed with the hospital.

Figure 10 Rainwater erosion on the pathways, exposed pipes and tunnels for heavy rain under the paths

The rainwater flow issue has been observed to get an indication of the circumstances. Observations, investigations, and discussions have been done with the Hospital Management Team and the district engineer to prevent the issues due to rainwater. Due to the amount of water from the village, a decision has been made to prioritize the construction of the drainage system outside of the hospital fence (above the hospital) to direct the water away from the hospital.

The drainage has been improved the previous year with a concrete channel that goes along the main road in the village. Some parts of the channel do not require the full concrete material where a mix of stones and concrete will be an effective alternative.

This type of channel is a common alternative in the surroundings whereof an example could be seen in figure 10.

Figure 11 Rainwater collection system from concrete and stone.

To adjust the rainwater passages in the hospital area, a similar construction intends to be created to the walking road outside the hospital area according to figure 11. As the construction material for the rainwater drainage was chosen concrete with large stones in it. This will lower the costs compared to using just concrete, but at the same time ensure the quality. Other options were investigated for the construction options such as, digging a gutter without any additional protection or filling it with large gravel. However, all these solutions were denied after the consultation with the district engineer and the rainwater engineer from EWB. Thus, the concrete with large stones solution was chosen as the most practical solution. Additionally, in front of the houses, concrete bridges are going to be placed to allow the people to move freely and not to limit their daily actions and movement. The position of the bridges can be seen in figure 12. This will consequently reduce the amount of water reaching the hospital significantly.

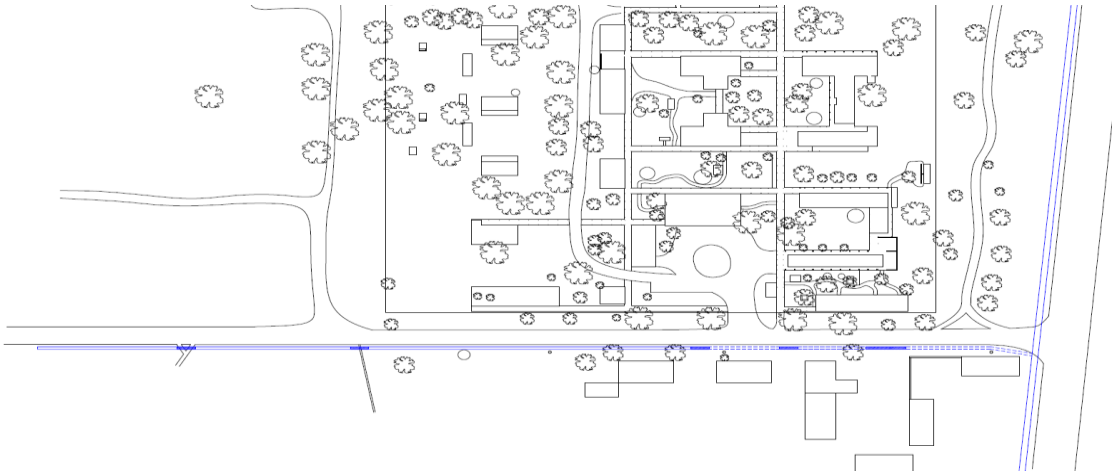

Figure 12 Overview of the road surrounding the hospital area by the drainage system.

4.3 Laboratory extension from the old RCH

The laboratory is currently limited depending on the small room areas. The hospital wants to expand their laboratory to be able to make their laboratory tests because now some of the tests are sent away for investigation which is causing delays to receive results and increases costs. According to the Hospital Management Team, several of the rooms in the existing laboratory are used for several purposes due to the lack of space. Mkula Hospital is a district hospital and should therefore be able to do their analysis fully independently, according to the HMT. The old RCH is currently located in the same building as the laboratory as shown in figure 13. The possibility of having extra space will allow the hospital to use more equipment for which they currently do not have space. Additionally, they can acquire new machines to conduct new tests. Therefore, the extension of the laboratory is a critical solution that will increase the quality of the healthcare services provided by them significantly.

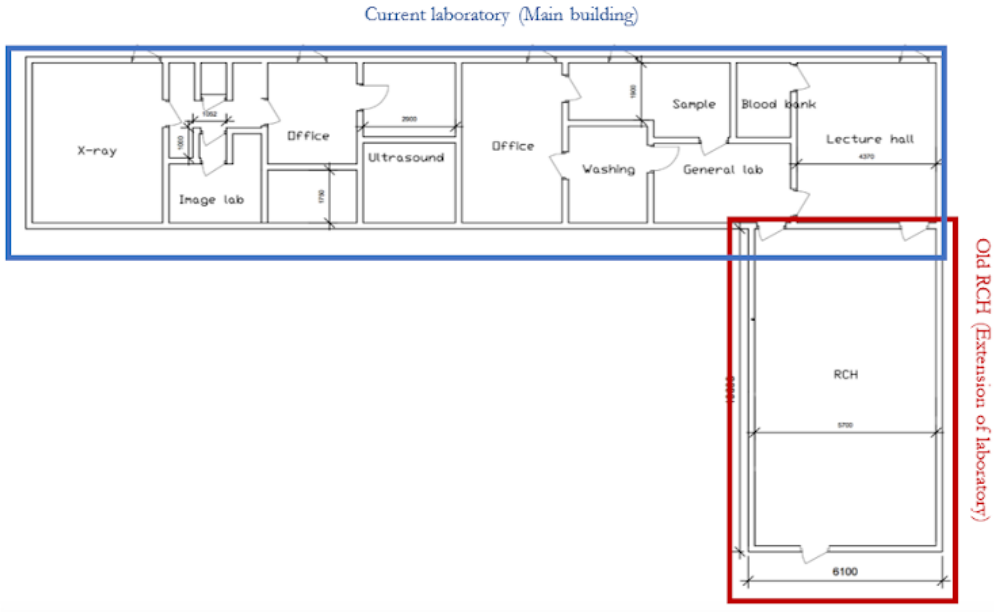

Figure 13 Current Laboratory and old RCH building

As shown in the previous figure 13, the old RCH building will be reconstructed as an extension of the laboratory. In discussion with the district engineer and HMT, the foundation and roof in the old RCH will be demolished to guarantee the quality of the product as these elements were extremely old. Afterwards, there will be a lot of waste material during the destruction of the current building and it was in the interest from the point of view of sustainability as well as the budget to reuse some of the components of the building. While the rest of the building (current laboratory) will be kept with only minor changes in the interior, including removing or adding few walls. It will be the same type of construction as the rest of the building made of concrete blocks. Afterwards, many meetings were done between us students, the district engineer, and the HMT to plan everything regarding the new laboratory. The laboratory is considered as the main priority for both HMT and EWB. Then, the student team started the design of the new laboratory using Revit as shown in figure 14 to be clearer for us. Moreover, the district engineer asked us to estimate the bill of quantities for the design we made and afterwards the district engineer estimated the costs of the new laboratory. Then, we discussed the costs with the project team in Sweden, but they have rejected these costs as it was higher than expected and could not be covered by the budget. Afterwards, we had a meeting with the district engineer and negotiated the costs with him and we succeeded in reducing the costs as EWB planned.

Then, after the meeting with the project managers in Sweden, we decided to postpone the construction of the laboratory. So in that meeting, we had informed them that we are going to postpone the project since the cost of the project is much higher than the available fund. That was because of the Corona issues so many organizations stopped giving funds. The hospital management team was disappointed, but they understood the corona situation and they were happy for what we achieved as everything was prepared and ready. We all agreed that the project will continue when EWB supports the project again with the available funds after the corona issues will be gone.

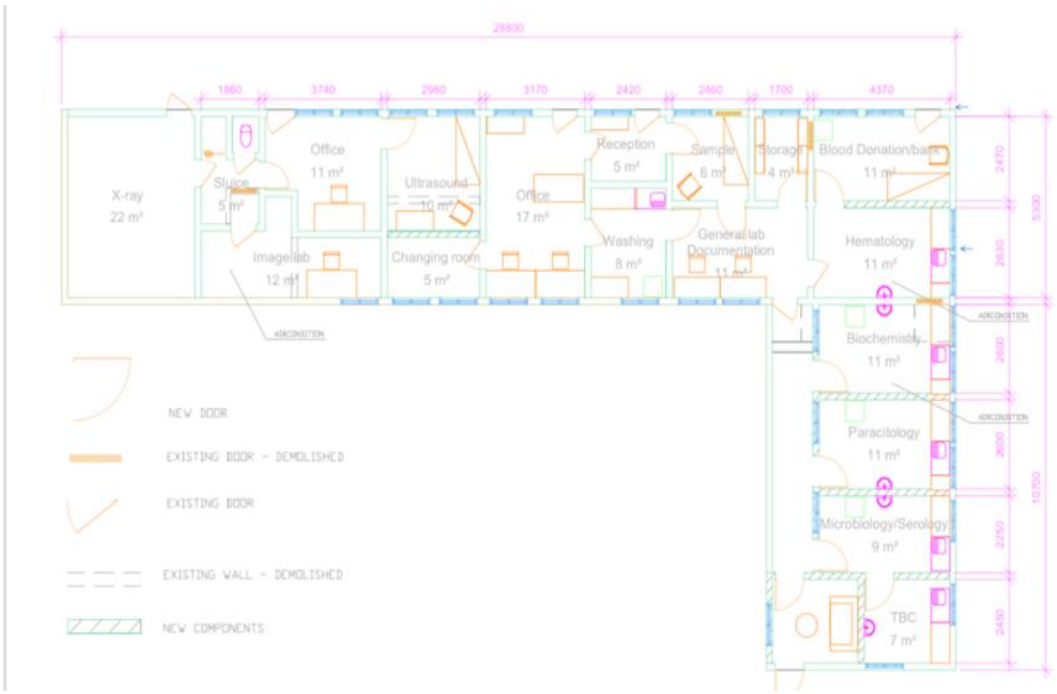

Figure 14 Revit drawing of the laboratory.

The open RCH area will be divided into four different rooms to separate the laboratory functions according to figure 15. An extra room in the left corner has also been added as a tearoom on request from the hospital management team to have their lunch breaks or stay in during their rest. The existing rooms will also be improved while the functions are divided and moved depending on the demands and wishes of HMT. Furthermore, the most effective and efficient formation has been considered from a technical and practical perspective. The rebuilding intends to create opportunities for the functions and activities to expand and not be demanded by other functions due to the lack of space.

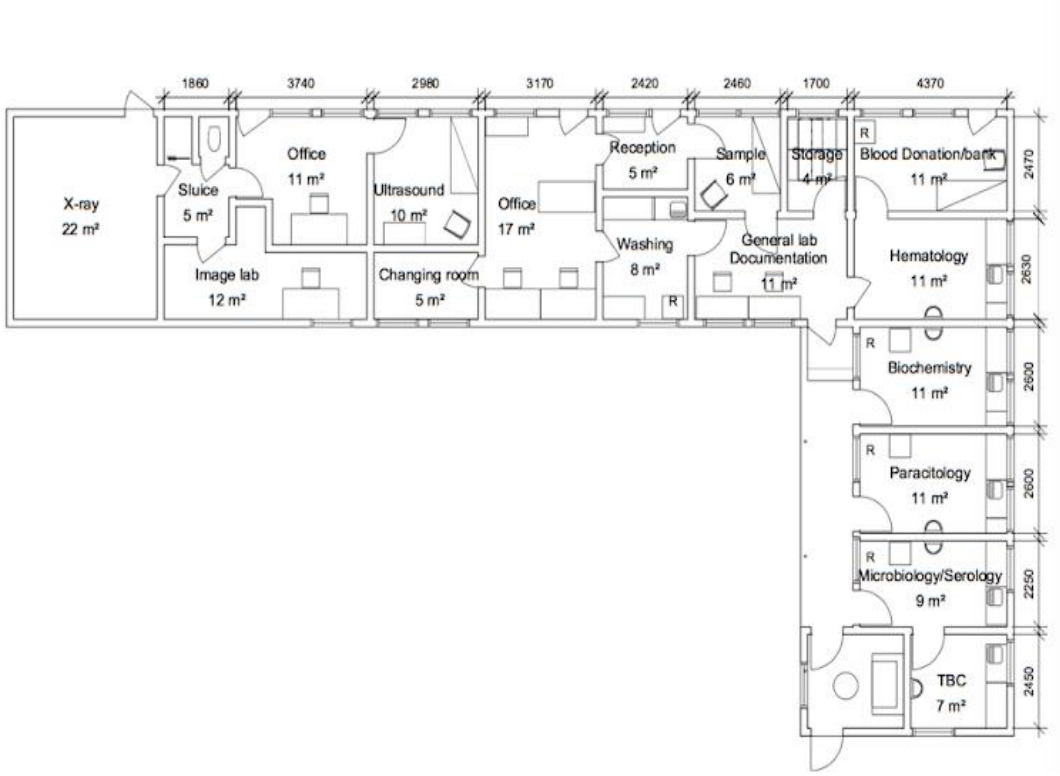

Figure 15 Finalized drawing for the new Laboratory

4.4 Trust

Due to the good communication between stakeholders, trust was created between the main actors, especially the students and HMT. As it is explained before, the HHPG introduced the students to the HMT in the first week we arrived, which creates more trust than if we were just recommended. Afterwards, we tried to enhance the communication between us and the HMT. Furthermore, we succeed to have a strong bond between us and the HMT especially the hospital doctor. For example, the HMT started to teach us their culture and traditions in shaking hands before starting our meetings with them. In the first week, the hospital secretary came to our home in the village and cooked for us and she also tried to teach us how to make Chapati which is the most popular Tanzanian bread. Therefore, we had the self-confidence that we can manage any trust issues throughout the project duration.

Since the hospital doctor was the main actor who took care of the students, our trust developed faster than with the other members of the HMT. For example, the hospital

doctors almost visited us every day in the village to explain to us some of the customs and traditions in Tanzania specifically in the Mkula village. He tried to make our life easier in Tanzania since we became friends all together. However, he invited all of us to his home to have lunch together with his family. Before going to his place, he wanted to go to the market to do some shopping and he took one of the male students to help him in the shopping instead of taking a female student. That's an example that showed us that trust was mostly developed between the males and him more than the females.

After a few weeks, the hospital doctor tried to create the feeling of trust more and more between us and him therefore, he acts as our father in that country. For instance, he asked the male students about football teams and which team we are supporting. Then, we discovered that we have mutual teams in common. Afterwards, he insisted on getting a new television in our home to come and watch the football matches altogether. However, the females did not have the same interest as the males and the hospital doctor so most of the time they went to sleep or did something else. Despite ignoring the females, the hospital doctor tried to solve a lot of problems that we faced in Tanzania either in the project or in our general life to make the females feel that he is caring about them. For example, one of the students got sick due to a virus in her neck and the hospital doctor helped her until she got fully recovered. Therefore, we knew that he wanted not only to enhance the trust bond between him and the males but also enhanced the trust with the females.

Regarding the rest of the members in the HMT, they tried to have a strong bond of trust with us after they saw the hospital doctor doing everything with us. For instance, they always support us with the car at any time if we are going to a market or a project that is far from our village. Also, most of the time the electricity went out after it rained in the village. However, the head of the hospital taught us how to have the electricity back from the main electricity room. Then, he gave the room keys to one of the students to open the room at any time because he is busy most of the time. Thus, we noticed that trust developed slowly with the HMT.

Finally, during the last meeting with the HHPG, we decided to postpone the construction of the laboratory due to insufficient funds. After that, we held the last meeting with HMT and informed them that since the cost of the project is much higher than the available funds, we will postpone the project. That was because of the corona problem, so many organizations stopped providing funding. The hospital management team was disappointed, but they understood the corona situation and they were happy for what we achieved as everything was prepared and ready. However, we were there to give them money and funds for the project so they can just say what we want to hear. Lastly, they gave us some valuable gifts for what we did in the project to appreciate our work at Mkula hospital.

4.5 Cultural differences

Since the project is located on a different continent, Africa, that most members of the student group have never been to, we were uncertain to what extent the cultural differences will influence the communication and slow down the progress of the project. Our advantage was that there were already several groups going to the same place for the last couple of years (every member of the project team went to Mkula at least once). Therefore, before the departure, we tried to obtain as much information as

possible about the cultural differences from the project team members as well as from the internet. The main topics that were found to be the most important were language barrier, gender equality, time management, and habits in the culture.
Regarding the languages spoken in Tanzania, every tribe has a different spoken language which can vary only by accent but mostly they are considered to be different languages as even the Head of Hospital told us that if everyone would be using their tribe language, it would be hard or even almost impossible to communicate with people from different regions. That is why the government is spreading and promoting the use of Swahili. However, none of us could speak Swahili, so the project members that already went to Mkula in the last years wrote down for us a couple of basic words to manage very basic conversations at the airport, market, bus, etc. Nevertheless, to be able to help the HMT to proceed and start new projects, we had to communicate with them in English. Luckily, we were told that all the HMT members spoke English at least to some extent so communicating with them is without any trouble. However, during our stay, we found out that the vocabulary of individual members is pretty limited, but there were always several of them so once in a while they took a few moments to discuss with each other if they understood us correctly. Still, we always managed to transfer all the information necessary. On the other hand, the rest of the hospital staff and most of the inhabitants in the village spoke either only very little English or none at all. That is why mostly a combination of English and Swahili was used with anyone other than the HMT.

Additionally, the student team was interested in the cultural differences that we should prepare for. Thus, during the meetings with the project team before the departure, the more experienced members tried to share with us their knowledge. This happened in the form of informal meetings with an open conversation where they were putting on the table everything that came to their mind and others added their individual experiences to it. Moreover, an anonymous questionnaire with open questions was made to get more information that one would be maybe shy or unwilling to share in front of a group. Topics such as gender equality, time management, hospitality, and hierarchy were among the most mentioned ones that needed the most adjusting from the team members. However, an important point to highlight is that all the previous project team members were Swedish, and few times teams consisting only of women were sent, however, this year a team made of two women and two men was sent. Additionally, this was also the first year when two other nationalities were in the student team, Czech and Egyptian. Therefore, we had an advantage over the previous teams with having more experience in the team of how to behave in different cultures where women do not have the same position in the society as in Sweden. As a result of that, we felt extremely confident that we can handle the communication and find common ground with the HMT.
During the meetings with the HMT, it was obvious that they were behaving differently to the males and females. What everybody in the project team agreed on was that the HMT trusted more the males than the females and preferred to communicate with them especially when a decision had to be made. This was an issue when only a female group went to Mkula. One of the female team members told us “we had to prove that we knew what we were doing more than we might have if we were male”. This occurred even during situations when we were planning trips to other villages or the doctors invited us to their homes. Even in this case, when we needed to agree on a date and time, they mostly came to us (males) rather than our female colleagues. Therefore, we all noticed this differentiation between the genders. Additionally, this phenomenon can be

connected to the fact that more boys apply and finish higher or university education. Thus, the people are used to the fact that mainly men are educated and prefer communicating with them (Mlyakado, 2012). However, the HMT understood that if they want our support they have to adjust and be able to work with anyone. That is why even when teams with only female members went to Mkula, the HMT got used to working with them and all the members felt like the communication and trust in making decisions was improving over time regardless of gender. From this, we could see that even though they are not used to women being in places of power and make decisions, they are still open-minded enough to understand and adjust to the situation.

Lastly, the last cultural difference that we noticed happened even before any meeting started. We were always trying to plan a meeting according to the schedule of the HMT to make sure as many of them can make it as possible. However, when it was agreed for example to meet at 2 PM, we were always on time. However, when we arrived in the office where the meeting was supposed to happen, only the secretary was present and she looked very surprised at what we were doing there. When we told her we have a scheduled meeting at 2 PM she told us "this is Tanzania, not Sweden when we say 2 PM we do not mean 2 PM". And she was right, only after at least half an hour, the HMT started to gather. According to our observations, this was caused mainly by two factors. Firstly, it was the fact that the hospital had only two doctors working there. Therefore, they were working the whole day from early morning until late evening and even had to be prepared to get up during nights if an emergency would occur. Thus, they were extremely busy, and often an unexpected case came up and they had to postpone our meeting as helping patients was a higher priority. The second factor that caused everyone to be late was that in Tanzania nobody is in a rush and does not stress. The Tanzanian saying "Hakuna Matata" meaning "no worries" nicely describes the way of living in Tanzania. However, some people took it to extremes, such as the district engineer who did not arrive on time and few times he did not arrive at all due to different reasons. All these delays caused all negotiations about the project design, costs, and new and the contract had to be postponed and our plan to have a signed contract before our departure from Mkula was not fulfilled.

5 Analysis

5.1 Sustainability

Sustainability, defined by Appe (2019) as "having resources without depleting their renewal or ability to reproduce", is a goal in many countries to protect our planet and preserve it for the future generation in an as good state as possible. The construction sector is one of the main polluters of the planet because it produces 39% of CO2 emissions, mainly during the stage of producing materials (Fang, Lu, & Zhang, 2019). Therefore, using environmentally friendly, reusable materials and reusing the materials already produced can reduce the environmental footprint significantly. Coming to Mkula, the project team did not have an idea to what extent sustainability is taken into consideration. The only information that we had, and turned out to be true was, that there is a ban on using plastic bags. When going to the market in a tiny village and buying as little as 2 tomatoes, all the stands had plenty of special bags from a textile that could be reused. This showed us that the inhabitants of Tanzania were very disciplined and followed the rules. Therefore, we wanted to explore new possibilities and how to help them to be more sustainable.

Firstly, we were curious about how much technology is used during daily life and the construction of new buildings. In the hospital that covered an area of more than 200 000 people, they had only 2 computers which were used only for very few accounting and administrative tasks and communication via email. Therefore, all information about the patients was stored on paper and not digitally. This was highly inconvenient as the materials took a lot of space and very prone to damage by moisture. Additionally, the only way to get an internet connection was through a USB stick. That meant that they still prefer using tools that are not dependent on electricity, as power cutouts are happening on daily basis. It was only 3 years ago when there was a backup generator installed in the hospital and it powers only the crucial components in the hospital (lightning and tools in the surgery room). Therefore, even when we had meetings with the HMT, we always had to print all the documents because they preferred to store them like that. However, during the meetings with the district engineer the technology was used a little more. He always came to the meetings with a laptop, but the only software he used for designing was AutoCad. Therefore, we were able to send him the drawings in the dwg. format (AutoCAD format) so he could in a way he needed. However, we were also making simultaneously a Revit model of the buildings under construction or that were planned to be reconstructed. Unfortunately, the district engineer did not know how to use the program, so the Revit model was used only for the needs of the project team and EWB. The use of only AutoCad made it very slow when creating the bill of quantities. All the components had to be measured and counted by hand, which is very prone to mistakes due to human error and they will only appear during the construction phase when the costs of making them can be high and can delay the delivery date by days or even weeks. However, changing the software that is used mainly in Tanzania is not realistic during the time of the project, therefore we just had to accept it. Nevertheless, the buildings in Tanzania were usually only one floor high, so the construction is not as complicated as for buildings that have multiple floors. Hence, it makes sense to use a tool that a wide range of people can understand and use.

Secondly, as said above, one of the main problems in construction is the emissions from the creation of the building materials. Therefore, the next point of interest was the building materials. Unfortunately, the majority of the houses in all the villages visited were made of concrete blocks. According to the local engineer, this was caused by the low price of the cement blocks (1 500 TZN = 7.5 SEK) compared to the other material

available on the market. Additionally, the size of the blocks (15cm x 15cm x 30cm) allows one person to easily manipulate the block but keep the construction going faster compared to masonry or other building materials. Furthermore, the creation of the cement blocks requires less technology than masonry, which needs to be baked in an oven at high temperatures, but the cement block mixture is only hardened in forms. Lastly, the availability of the raw materials for the other materials, such as clay or wood, is very scarce, thus, they have to be imported. Due to all these reasons, the cement blocks were the best option for the construction of the superstructure.
Thirdly, as stated in the previous chapters during the reconstruction of the laboratory, the current structure including the roof and foundation will be destroyed to guarantee the quality of the product. Therefore, there will be a lot of waste material during the destruction of the current building, and it was in the interest from the point of view of sustainability as well as the budget to reuse some of the components of the building. Hence, a meeting was scheduled with the district engineer to see what can be done with this issue. We went through every item in the bill of quantity to find out if they can be reused in the new construction. However, due to the old age and bad state of the building majority of the components will have to be thrown away. However, we managed to find a few items that will be taken from the current building and used again. These items were a couple of doors and windows. This decision not only lowered the total price of the reconstruction but was also good from a sustainable point of view.

Lastly, the focus was turned from the materials and the components used, to the energy consumption. Hospitals are relying on the use of technology to help the doctors to take good care of the patients. Therefore, to power these machines, a lot of electricity is needed. Moreover, as was mentioned before the reliability of the energy supply is very low and power cuts are happening daily. This was partially solved by installing the independent power generator that starts automatically whenever the power is out. However, to run the generator, a lot of fuel is needed that costs the hospital a lot of money that cannot be spent elsewhere. Thus, an investigation of using several solar panels on the roof of the new laboratory was made. An example of how a hospital can use solar panels was seen during the visit to Kolandoto hospital. In this hospital, they have installed solar panels on several buildings, and the power a wide range of devices. Therefore, the energy could be used to power some of the machines, and batteries will be installed to allow power storage and to guarantee smooth operation even during the power cuts. This will save the hospital a lot of money and will guarantee them that the machines connected to this system will keep running constantly. This is especially crucial for the fridges where the material is stored that can go bad very quickly when heated up. That is why installing solar panels will be practical and economical for the hospital.

5.2 Application of the Virtual team framework

During the lifecycle of the project, the main struggle was with the organizational structure and knowing how much and when to communicate specific information to different stakeholders. At the beginning of the project, it was expected that we would be mainly transferring the information from the HMT to the HHPG located in Sweden, which will make the decisions. However, we were left often to make decisions ourselves without their involvement. Therefore, the expectation of being part of a virtual team was not fully fulfilled and more of a hybrid organization between the

traditional team and the virtual team was created. However, this meant that challenges occurring in both types of organizations had to be faced at different stages of the project.

The high-performance virtual team framework introduced the importance of technology integration in an organization. Therefore, before the departure and beginning of the project, all new members were introduced to the technology used, the practices of how to use which software (AutoCAD, Revit, Google Drive, etc.), and where to share what information. Therefore, the student team got familiar with these practices to be able to use them to their full potential. The use of this software was very useful while designing, creating, and sharing information between HHPG and the student team. However, during the communication with the HMT, most of this technology was useless and the student team had to bring all the information that wanted to be shared on paper as the HMT was not able (due to lack of technology or knowledge how to use it) to process the digital form. Additionally, these digital models could not even be used in the later stages of the project as the student teams are located at the site only for a couple of weeks per year. Therefore, the creation of these models adds value only to the donors, however, the usage of the models during the construction phase is very limited.

Secondly, the management of the project team and leadership is very important to run an aid project team. Leadership is as important in virtual teams as in traditional teams to maintain focus on the objective and keep productivity as high as possible. However, in the structure of the HHPG, the hierarchy was very flat with only one member stepping up slightly as the project manager, however, he was absent (due to personal reasons) for most of the project, so it was hard to know to whom one should turn with a question or who has responsibilities for what. This uncertainty made decision-making go slower than if a clear structure would be set up with a clear decision-making process. Therefore, nobody was responsible for any specific part of the project as all decisions as well as designs and proposals by several team members. As an outcome, this made all members have a feeling they are involved in all parts of the project and most of the decisions were made but slowed down the process significantly.

Moreover, during any project keeping the focus on the objective and keeping the scope within certain limits is crucial to set up an achievable goal. This is especially important when the project has a limited budget (as the HHPG has, due to relying on donations from other parties). However, the instructions at the beginning of the project to the student team were to explore all the possibilities for future development. Therefore, sub-projects that could have been chosen (except for the reconstruction of the laboratory that was the main priority) were evaluated such as, fixing the non-functioning ambulance, broken gutters on most of the existing buildings, lack of equipment in all hospital departments, etc. Therefore, a lot of information about how all of these problems can be fixed was collected and reported to the rest of the HHPG without any clear guidance and focus on the plausibility of actually starting these small projects. This brought confusion to the HMT that we were getting a lot of information about all these problems that they would also like to address, but we were not able to tell them what are the chances that we will be able to help them to fix them.

Lastly, the virtual team performance framework introduced the importance of stakeholder engagement, which is also important in traditional teams. Therefore, we paid close attention to the relationships with the stakeholders during the project to

ensure the transfer of information and communication between them runs smoothly. It was easy to keep the HMT engaged in the project and all our sub-projects we explored, as they felt the urge to fix as many of them as possible and they were aware of the fact that we can fix some of them for them. Thus, they were willing to sacrifice the time of the hospital staff to help us with anything we needed, from access to any facilities, through talking to the staff and the doctors, to take us on a trip to the next closest hospital that took the whole day. Thanks to this we saw the commitment of the HMT to facilitating us and giving us as much help as they could. On the other hand, the relationship with the EWB was mainly about fulfilling all their requirements of how to report the tasks we were doing and additional requirements.

5.3 Trust

According to Lumseyfai (2019), trust and communication between stakeholders need to be granted as well as between the team members to manage their time efficiently and effectively. Having another group of bachelor students at the same time in Mkula helped us speed up the process of settling in at the hospital project as well as in the village. Also, the presence of the HHPG for the first introductory week helped us to understand what information is most important to us so that we can continue the project. At this stage, a lot of clear knowledge was shared in the form of conversations and shared documents, including information about working with HMT before we arrived. As mutual trust between employees and management in an organization is a key factor for organizational change and is best reached through consultation, participation, and empowerment (Morgan and Zeffane, 2003). Hence, since the first week of the Mkula Hospital project, a good relationship of trust has been established between the students, HHPG, and HMT.
According to Neves and Caetano (2006), trust creates lower levels of stress and work conflicts, which reflects the importance of its presence in organizations. Trust has also been proven to be a central ingredient in relationships and positively affect organizational commitment. Moreover, the relationship between HHPG and Mkula Hospital's management was established in the spring of 2017 but was further strengthened during site visits and regular communication (mostly through email) until spring 2020. When we arrived at Mkula, we observed the strengthening of the bond between the two parties and the casual conversations between HHPG members and the managers of Mkula Hospital about family and personal interests. Additionally, we learned the structure and of the HMT, which helped us in understanding which members of the team we should approach with specific questions. To a certain extent, this fact promotes the establishment of a relationship between us and the hospital management department. Establishing informal relationships encourages the establishment of trust between both the HHPG and the HMT.

The Global Barometer (2005) is a major study examining trust in countries, among other topics. According to the Global Barometer (2005), the general trust in Tanzania is very low. Most Tanzanians agree with the following statement: “you must be very careful in dealing with people." The hospital doctor tried to emphasize the trust issue that is why he tried to create a trust relationship between us and the HMT. Then, he decided to invite us to his home for lunch with his family and this visit had a great impact in creating and developing trust with him outside of the meeting rooms of the hospital. The fact that he initiated the visit and showed us that he wanted to create a strong relationship with us, helped us to understand that the interest of creating trust

was both sided. Thus, it was our priority to create trustworthy relationships with HMT members.

5.4 Communication

Consequently, our literature focuses that trust is important when managing change in organizations, not necessarily in a direct way, but through factors of communication, involvement, and engaging the whole team in the decision-making processes through the overall project.

The first challenge that was observed during our project at Mkula hospital in Tanzania was the differences in the perception of time. In Tanzania, it is totally fine with them to be late for the meetings, not as in Sweden. For example, when we showed up early for the meetings, the HMT was surprised that we were on time and the hospital doctor said, "why are you so early, you are in Tanzania not Sweden". As a result of delaying almost all the meetings or postponing them had affected our way of communication between the students and the HMT.

The second challenge that we faced during the project was the communication between the HMT, district engineer, and construction workers. Since at Mkula village, it was rare to find people who are good at communicating in the English language. For instance, during the meetings with the HMT and discussing some issues in the design with the HMT. The hospital doctor had to translate what we were discussing to the laboratory workers to involve them in the design process. Afterwards, the hospital doctor had to translate what they discussed with the Laboratory workers to the students. Thus, the meetings always took longer than expected due to communication issues through the meetings, which sometimes led to some misunderstandings as English skills were limited.

According to Holste and Fields (2010), it is crucial to rely on the team members to be willing to share information and knowledge which in turn depends on the level of communication as well as trust. During our investigations for the new RCH construction work, it was hard to ask the construction workers about the progress of the work or what difficulties that they had been facing throughout the project. However, the district engineer was always willing to help us and translate to the construction workers to get the information we needed. What we noticed from this was that the district engineer tried to rely on the whole team by sharing the information and knowledge even if the English skills were limited.

The third challenge that we faced during the project was the communication between the students and Engineers Without Borders (EWB). EWB asked the students to submit progress and update reports which we felt because we have followed up all the progress of HHPG, it is useless. Furthermore, during the project, the students took almost all the decisions in the projects with the HMT with the help of the HHPG sometimes. That is why the students felt it was kind of wasting time to submit reports to EWB. According to Chinowsky & Rojas (2003), trust and communication between stakeholders are extremely important to be implemented in virtual teams in construction projects. However, the students and EWB did not set up any kind of relationship before or during the project. That was the reason that led to a lack of trust between both EWB and the students. For example, during the project, we had an issue that we wanted to discuss

with the rain management engineer via E-mail But his opinion is of no use to this issue. Afterwards, we made our own decision with the HMT with the help of HHPG. Thus, mutual trust and communication between employees and management within an organization are the key factors for organizational change and are best reached through consultation, participation, and empowerment (Morgan and Zeffane 2003).

Finally, to succeed with an organizational change, communication is a crucial part as it justifies, enhances a sense of employee adequacy, and clarifies changes in the role of the employees (Neves and Caetano 2006). This is exactly what happened when we communicated with HHPG in Sweden. During the entire project, video conferences and messenger calls were conducted. Since the facial expressions and enthusiasm of all team members are reflected, this technical integration helps to visualize our thoughts and opinions. That way of communication also provided us with information on what changes will take place and consequences concerning that and, thereby, it creates a sense of control. Thus, when the employees feel greater involvement in the change process, via direct consultation by supervisors or higher managers, they express a higher trust in the management (Morgan and Zeffane 2003).

5.5 Cultural differences

When conducting a project in a foreign country, the literature suggests that one can run into problems due to cultural challenges due to language barriers or different habits and traditions. A similar outcome was reached during the empirical study in Mkula.

The first major difference that was observed during the stay in Tanzania was punctuality. In the European culture people usually live by the quote of Lik Hock Yap Ivan “If you're early, you're on time. If you're on time, you're late.” Therefore, the student team was always ready for all meetings or trips a couple of minutes before the agreed time. On the other hand, the HMT and all the locals were always very surprised when we showed up before or at the agreed time. After a while, we understood that this can be due to the reason that life in Africa is much more unpredictable and anything can happen during the day or on the way somewhere. The poor road quality and the unorganized bus schedules mean that one can only guess how much time the journey will take. Secondly, everyone is trying to enjoy every day and everyone seems to be happy all the time. Therefore, they do not worry about every single problem and try to control every aspect of their lives, because they understand that life is short and enjoy every single day of it (the life expectancy in Tanzania is 65 years compared to 81 years in Europe (World Bank Group, 2020)). On the other hand, it could have been also caused by the “cultural trap” described by Ika (2012), when the locals do not commit to the project and do not put high priority on it. However, it is discussable if they understood the potential gain from the project being successful for the community.

Lastly, the major cultural difference was how differently the locals in Tanzania were treating men and women. This was apparent in all situations, such as official meetings with the HMT, shopping at the market, taking a bus, or even just shaking hands. These differences in behavior ranged from, not offering to shake hands with the women to directing all questions or important information to the men rather than the female. This can be explained by two main factors. Firstly, men have a responsibility to take care of the family and provide food and money to them, compared to the women that can stay home with the kids or just work on the fields around the house. Therefore, men have

much more responsibility and are used to making deals or arrangements mostly with other men. Thus, they are not used to communicating with women about serious topics. Secondly, this issue is deepened by the fact that there are many more male universities graduates than female. Johnson (2011) states that there are only 35.8% female graduates compared to 64.2% of male graduates. Thus, even the educated people are used to communicating and working with males and are used, that they are mostly the ones that are in the position of power and make the final decisions. Even though the HMT was already used to female students and engineers coming to the hospital and helping them, the difference in behaviour was still obvious.

6 Conclusion

This thesis explored the challenges of the aid project teams that are sent abroad, bases on a literature study and a current aid project. It used a case study during which a group of students spent two months in Mkula hospital where we were helping the HMT to supervise the construction of the RCH building and to develop a design plan for the reconstruction of the laboratory. The focus of this thesis was put on the trust, communication, and productivity of the project team during the project when we were involved in it. All three factors were evaluated on levels of, the student team, HHPG, EWB, and during the cooperation with the HMT.

How to create trust within a team on-site compared to a virtual team?

Trust is connected both to collaboration and communication between different stakeholders. In our project, trust was created with a specific group of members. For example, before coming to Tanzania, the HHPG and the students had shared their knowledge and experiences in several meetings either formal and informal. That kind of collaboration created trust between both the students and the HHPG. However, at the same time, EWB did not collaborate much with the students either formally or informally. This lack of collaboration led to a lack of trust between the students and EWB. This happened when the Covid-19 pandemic started, and the EWB contacted the students and asked them to return home as soon as possible. But because of the lack of trust between the students and EWB, the students decided to spend the rest of the trip and did not show interest in going back home. Afterwards, the students had to come back home when the HHPG team contacted them as mutual trust was created clearly between the HHPG and the students. Finally, in the introductory week in Tanzania, the HHPG introduced the students to the HMT. However, creating trust in a team on the site was much harder than creating trust with the virtual team with the HHPG. However, the doctor at the hospital established trust between us through his informal discussions and invitations. Hence, lack of trust or communication will affect the management responsibilities of the virtual team. This lack can result in cost overruns, late delivery tasks, and failure to produce a successful project solution.

What role does communication play in the decision-making process in an aid project team?

The analysis shows that trust, transparency, and the feeling of involvement are important to have good communication among all the stakeholders in an organization. For example, communication between the students and the HHPG in Sweden was done virtually in a perfect way through emails and video conferences. Moreover, trust played a vital role which led to collaboration and involvement between both the students and the HHPG. However, limited communication was done between the students and the whole EWB team including the rain management engineer due to the lack of trust between both parties. Furthermore, the challenges that we faced during communication with the HMT affected our project duration and progress. For instance, misunderstandings occurred due to the limited skills in the English language. That led to changing the design of the laboratory and the rainwater design a couple of times and one of them was with the district engineer on site. Also, communication with the construction workers had affected the progress of the construction work in the RCH as we could not communicate with them. Since the students had to wait for the hospital

doctor to be free and could come to translate and explain to the construction workers. Hence, communication with the hospital doctor was the main advantage while communicating with the HMT as trust played a vital role to develop our relationship with the hospital doctor.

How did the cultural differences influence the Mkula project?

The analysis shows that culture differences was the main challenge that influenced the Mkula project as the project's stakeholders are all from different backgrounds. For instance, the student team is a part of the stakeholders of this project, and it consists of Egyptian, Czech and Swedish engineers. Also, EWB and HHPG are engineers from Sweden while the HMT and the local engineer are from Tanzania. Therefore, different cultural backgrounds have joined the Mkula project. However, language barrier was a great challenge during the execution of the hospital project. As misunderstandings can always occur due to the Tanzanian teams had delayed the projects progress. That is why cultural differences had a huge impact in affecting the project's productivity and progression. This was caused by the fact that each stakeholder group and even their individual members differed in the way they kept promises about coming to meetings or delivering promised product.

What challenges affect the project team when it is located on a different continent, such as the Mkula Hospital project?

All the findings in this thesis concluded that three main factors influenced the productivity of the team in Mkula. These factors were trust, cultural differences, and communication. Firstly, building trust within a newly built team as well as between the different stakeholders is crucial to ensure that the project runs smoothly. This influences the transfer of information, the caution that one side is trying to cheat the other one or trusting the quality of work done. Secondly, the cultural differences between the team members or the stakeholders play an important factor as the people have a different understanding of time, keeping promises, or cooperating with the opposite gender. This difference then impacts the productivity of the whole group. Lastly, the most easily influenced factor that affects productivity is communication, including communication methods as well as personal meetings. Choosing the correct form of communication (phone calls, messages, email, etc.) is crucial and must be revaluated through the project as every different stage of the project and the information that needs to be transferred require a different medium.

Both the literature and our experience during the Mkula project concluded that building trust within the teams as well as between the different stakeholders is crucial to ensure smooth execution of the project. This can be done mostly by informal meetings when the different members get to know each other outside of the official settings. This helps to understand each other and improves the cooperation of within as well as between the different teams. Lack of personal contact can create insecurities and doubts about the decisions made by other parties. Secondly, communication including the medium through which the information is transferred has to be chosen wisely, especially in the case when face-to-face meetings are not possible. Nowadays dozens of software can be used and each of them has its advantages and disadvantages. Thus, depending on the information transferred and between which stakeholders the communication is occurring and what kind of relationship, and if the communication is worth storing for

future reference. All these factors must be taken into account and revaluated before each interaction. Lastly, the productivity of the project team depends on multiple factors including the ones discussed earlier and high productivity means that the project will be delivered on time and preferably of high quality. Therefore, looking after the trust, communication is vital for delivering high-quality aid projects.

6.1 Recommendations

Based on the experience and knowledge gained from participating in the Mkula hospital project and researching the topic of aid projects, we have formulated a couple of recommendations for future teams. Having any of these tips could help to improve how the team works and performs in any similar settings as the Mkula hospital project.

- It is beneficial to organize informal meetings before and even after the start of the project. This creates trust between the members of the team as well as between different teams. Additionally, personal experience and tacit knowledge can be transferred onto the new members in a friendly way.

- Create and make sure everybody understands the hierarchy within the teams, so they know who is responsible for which part of the project and knows who to ask for help or opinion.

- Set up clear objectives for the period present on-site and the harmonogram for the whole project.

- Engineers Without Borders should explore and evaluate any other possible projects and discuss their priorities with the hospital management team in order to have a better health life in Tanzania.

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8 Appendix 1 - Diary

03/02 – Monday

We had our first meeting during which the main point was to introduce us to the hospital management team and to see what progress they have made during the last year.

04/02 – Tuesday

During this meeting we have talked about the plans during our stay, what we want to focus on and what projects have priority. We went through the plans made last year for the new laboratory to see if the requirements have changed from last year. We also made a tour around the hospital to get a good understanding of how the whole place looks and what could be upgraded.

06/02 – Thursday

We went to see the current laboratory and the place where it will be extended after the RCH is finished.

07/02 – Friday

This was the last meeting when the 3 more experienced girls were present so they wanted us to take charge during the meeting and to make a clear plan with the hospital for the next two months. We agreed to finalize the laboratory plan asap and then to develop a new plan for the rainwater management and potentially explore the possibility of building new wards for insured patients.

General comments

During these meetings a lot of people were present (7 of us and at least 4 of the hospital stuff). Therefore, it was important to agree before the meeting who is in charge, who is taking notes and the rest was mainly just listening. This required a lot of preparation because we did not want everyone to speak in order to avoid confusion.

10/02 – Monday

This was the first meeting during which we (only students) were alone. During this meeting we have presented our rainwater management plan and got a lot of useful feedback. We also went in the morning to measure the lab to check that all the taken measurements are correct so we can finalize the drawings. We agreed with the hospital team to invite the main engineer for the next meeting so we can present him the “final” drawings of the laboratory and get his opinion about the changes.

After this meeting we have decided to divide ourselves in two teams. One will mainly focused on the laboratory and the other one on the rainwater. Bassem and I took the rainwater system.

12/02- Wednesday

David and I went to check exactly where the rain water drainage should be… then we have made the first conceptual design for the drainage using Autocad to sketch our design… At the same time, the girls were finalizing the Revit model to get prepared for the meeting with the Engineer.

13/02 Thursday

Meeting with the Engineer and hospital management team, we discussed everything regarding the laboratory on the Revit and the engineer requested to show the exciting walls and the demolished ones so he can estimate the quantities and estimate the budget for the project.. Also we went with him to check the exciting building and to check the height for the upcoming laboratory and check if is it possible to construct the new building with the exciting foundation or not … then we discussed with him the rain management system and he suggested a great idea to make it from stone rather than concrete so we can save a lot of money. Then he asked us to make the proper measurement for the whole system so he can estimate the quantities as well

17/02 Monday

We made the final design for the rain management system as we went to measure the whole system in the morning and also the girls finalized the drawings on the Revit then we sent an email for the engineer to estimate the quantities and estimate the budget as well

19/02 – Wednesday

Today we got comments from engineer from EWB regarding the rainwater system. Most of his comments were similar to the local engineer that we talked to before. So we just updated him about the changes. He also advised us to make calculations about the rainwater amount that we are not sure if they even do here. We will talk about it with the local engineer.

26/02 – phone call with Daniel

Daniel was leaving to Spain for a month so we updated him for the last time and he gave us few more tips, contact to the AC company and told us who is gonna be responsible in his absence.

04/03

We are still waiting for the cost estimation from the engineer so we just met with stefano and Benjamin to update them, discuss the RCH progress. None of the doctors could make it to the meeting so it was very informal.

We are still waiting for the cost estimation. So we contacted him via email to see how far he got.

The next day he replied that he is busy but should finish it soon. Two days later we still did not get anything so we tried to call him but we could not reach him. The next day he sent us email saying that his brother was sick and he had to go visit him.

12/03

Today we finally met with the engineer. He came to Mkula and brought the cost estimation with him. We had to quickly go through it and see if there are any points in the list that stick out so we can discuss it with him. We found few elements such as two different pricing for the same windows, etc. However, we could not decide if the pricing is fine, because we had to send it to Sweden for the rest of the group to make the final decision.

18/03

We arranged a meeting with the swedish part of the team very quickly to make quick progress as we are gonna leave soon. The gave is few more comments on the costs and we agreed it was a good to make the whole roof and foundation for the new laboratory. This increases the costs significantly, but there is no way of knowing in what condition the

current foundation and roof is and to know how long it would last before needing to be fixed.

23/03

The engineer came again to Mkula so we can talk more about the costs. He brought with him new, more detailed plan. We gave him few comments about the things that can be skipped or improved. Then we told him we have to make the whole project cheaper. We looked at every single item on the list to see if there is a way to make it cheaper. In the end the biggest difference was made by deciding not to use the epoxy floor in the whole building but only in the laboratories where it is actually important. However, even after lowering the costs significantly and deciding to postpone the rainwater system project for later, the cost was still too high. Therefore, we had to schedule another meeting with the swedish team to see what else can be done about the budget.

24/03

We called the swedish team to see what their opinions are about the new cost estimation and if there were any changes in the budget. However, we found out that we do not have enough money to start the reconstruction of the laboratory at the moment. Therefore, they decided to postpone the project for a few months and wait until they manage to get more money. That can be challenging because the corona spread was started and no companies wanted to give us more money. So our task was to inform the hospital about this bad news during the last meeting the day before we are gonna leave.

25/03

That was our last meeting in Mkula... After the meeting with the project managers in Sweden, we decided to postpone the construction of the laboratory. So in that meeting we had informed them that we are going to postpone the project since the cost of the project is much higher than the available fund. That was because of the Corona issues so many organizations stopped giving funds. The hospital management team was somehow disappointed but they understood the corona situation and they were really happy for what we achieved as everything was prepared and ready. We all agreed that the project will continue when EWB supports the project again with the available funds after the corona issues will be gone.