

# The design of a manual for small scale production in Tumaini Innovation Center

Public Summary

## Background

Due to poverty in Kenya, not all youth has the opportunity to go to school and to find a job. Tumaini Innovation Center, a vocational education institute in Kenya, provides courses for youth at risk. Next to their courses, they have a project where they focus on the needs of the community. The students collect the needs and design a product which they can sell in the community. Tumaini is able to design their own prototypes but they are not able to produce a viable product. The products are ordered in China and sold to the community. The aim of the research is to design equipment which enables Tumaini to be able to produce their own products.

## Methods

The research exists of two main phases. The fieldwork, which is done at the Tumaini Innovation Center, and the design phase, which is done at the UT in the Netherlands. During the fieldwork, as much information as possible is gathered. The methods used are interviewing and observing. Next to the interviews and observations, these three weeks are spent at the school to be able to understand the school system. The design phase is done at the UT. The first design objective is to develop an example design which can be produced with the injection molding machine of Precious Plastic. The second objective is to share the information about the design and production process with Tumaini.

## Results

The design phase includes the process of designing an example solar alert, which could be taken as an inspiration in Tumaini. The full process can be read in appendix 6 of the report. During the design phase, many insecurities were found. The solar alert which is ordered in China is a complex product with many details. The more simplified the new design will be, the higher the chance the injection molding machine will be able to produce the product. All this design thoughts have been considered during the development of the manual.

The manual is a guide for injection molding for small scale production, which is a manual which is specifically written for the Tumaini Innovation Center and their LEE course. The manual consists of different chapters, which can be used separately. It starts with an introduction, which gives an overview of the content and also explains what preparations have to be done to use the manual, but which are not discussed in the manual. The chapter on injection molding gives a quick introduction into injection molding, into Precious Plastic and explains the difference between injection molding in industries and on small scale. The chapter on the design phase takes the user step by step through the full design process. The production phase explains how to turn a drawing into a CAD 3D file and what different materials and methods can be used for the production of the mold.

## Conclusion

The manual is a product which can be used in combination with the injection molding machine of Precious Plastic, and can be used when the machine is build. A deliverable in the form of a mold would not be possible in the end, because of the many limitations

and insecurities which are found during the design process. Therefore it is recommended to have a follow up project with the Tumaini Innovation Center at the moment the machine is build and to inform about their needs at that moment.