

Challenge name	Automatic cassava peeler Indonesia
Challenge owner	Fairtrade Original for tapioca mill in Pati, Java , Indonesia
	<i>Company</i>
	<i>Name of personal contact:</i> Martin Boon, Manager Sourcing & Development of Fairtrade Original
Email challenge owner	
Phone challenge owner	
CoC Number	
Preferred way to contact	<input type="checkbox"/> email <input type="checkbox"/> SMS / what's app
Brief summary	Fairtrade original is working with cassava farmers in Indonesia as this is the raw material for krupuk. Importantly, large cassava roots need to be processed within 24 hours after harvest into tapioca flour, otherwise they cannot be used anymore. This poses problems as the hand peeling process is very labor intensive, there is a labor shortage, which leads to many roots ending up unpeeled. This creates a preventable loss, if only there was a solution that allows for a more efficient use of the cassava roots.

About the challenge owner

Fairtrade Original is a 100% Fairtrade company: all our products are Fairtrade certified and we work with relatively short supply chains with a focus to support small-scale farmers. A fluent process flow is essential for a successful end product. In the case of the Fairtrade krupuk, which is a relatively new product, there are constraints in the production of the main ingredient, tapioca flour, because the peeling takes too much time, there are not enough people for peeling and many roots are left unnecessarily. The thought is that an automatic cassava peeler can solve this constraint and therefore help the Fairtrade cassava farmers to remain in business.

Challenge description

In order to prevent cassava roots going to waste, something needs to be done to help cassava peelers in doing their work more efficiently. The solution could be found in different areas. For example, an automatic peeling machine could be developed that is able to peel cassava roots of various shapes and sizes. Another approach could be about the 24-hour deadline for processing the roots, which could potentially be extended by treating the roots in a certain way. But there are many more directions that a team of students could come up with.

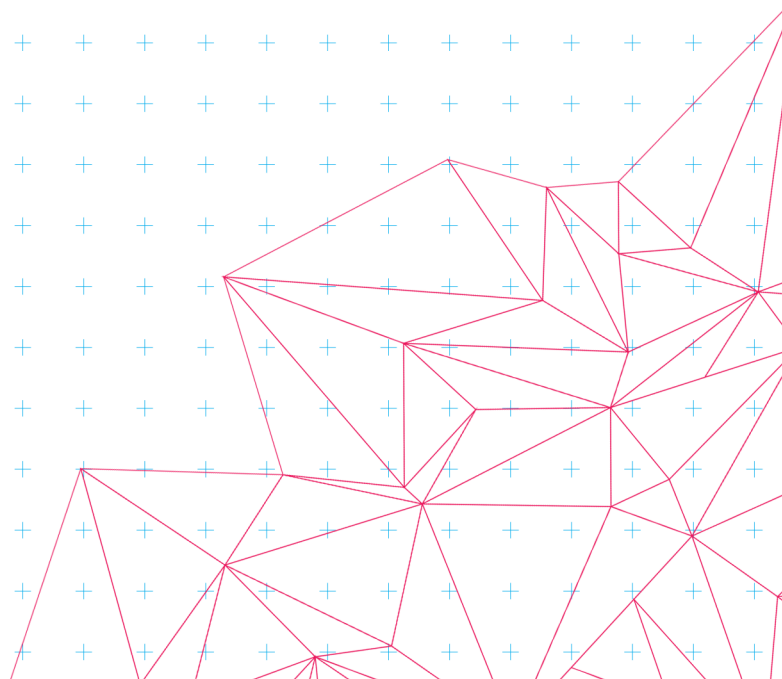
The overall goal is to support the tapioca mill in the process of peeling cassava roots, but as well to keep the farmers into their new Fairtrade business.

What are possible components you see fitting in the work of the project group?

- . Design
- . Cost calculation of local construction
- . Sustainable energy source
- . Durability and maintenance
- . Test phase with instruction

Explain whether something already exists that students will build on.

In Holland the potato peeler exists, but the shape of potatoes is more regular and round whereas a cassava root is longer (like a big thick carrot)



Challenge picture



Input and involvement of challenge owner

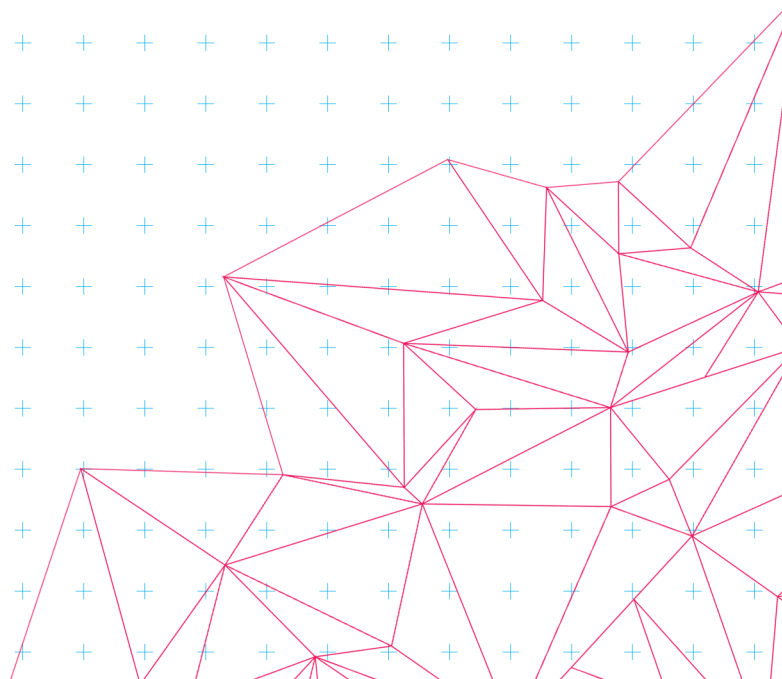
I work for Fairtrade Original and will act as the link to the counterpart in Indonesia (tapioca mill + local consultant in Java). This challenge will solve the continuity of this relatively new Fairtrade Product and therefore the continuity of the Fairtrade cassava farmers.

Resources

What resources are necessary for the students to work on the challenge?
For the project knowledge on design and building the machine is needed.
Materials for a prototype are needed.

What resources do you offer to students?

- *Expertise*; Expertise on the raw material and peeling requirements come from Indonesia
- *Materials*; not sure if it is possible to instruct construction in Indonesia long distance



Roles of different disciplines (only for ISBEP)

Automotive Technology	Processing cassava roots could be done through an automatic system that requires sensors, physical control systems, potentially some logistical processing, and be able to work with roots of different sizes and shapes.
Electrical Engineering	Develop electrical components that are used in the technical solution, for example when developing an automatic peeler.
Industrial Design	Designing an ergonomic (hand) peeler could be a solution that makes workers more efficient without being burdened. ID students could contribute to this design.
Psychology and Technology	When developing a system to be used by users, their needs and abilities should be taken into account, especially since the users are from a population that we are quite unfamiliar with.
Chemical Engineering and Chemistry	Investigate properties of the roots that allow for a treatment process that makes them processable for longer than 24 hours.
Sustainable Innovation	Fairtrade has the main vision to create sustainable and fair options in the food industry. An SI student can contribute to this vision by analysing processes in the krupuk industry and detect ways to increase its sustainability.
Industrial Engineering	Working on logistics in the production process of krupuk, from farming the cassava to peeling the roots to processing the tapioca to transporting all relevant goods.
Mechanical Engineering	Processing cassava roots could be done through an automatic system that requires sensors, physical control systems, potentially some logistical processing, and be able to work with roots of different sizes and shapes.