



Increasing productivity and relieving strain on farmlands in the developing world

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2015 KEEN Winter
Interdisciplinary Design
Experience
January 4-12, 2015
Bucknell University,
Lewisburg, PA

Bucknell
UNIVERSITY



Significance

Farmhands in developing countries are expected to complete hours of rigorous work every day. After time, this can take a serious toll on the body. This is especially concerning because many of the workers are children and will have to endure these working conditions for their entire lives. In fact, young workers make up about a quarter of the agricultural workforce in developing countries. Pair this with the limited access to quality health care in these rural areas, and the strenuous labor farmers face becomes a very serious decent work issue. This is why one of the main functions of our device is to minimize strain on workers harvesting crops.

The other main function is to increase overall productivity of workers. Experts from the International Labor Organization (ILO) suggest that helping farmers in developing countries increase production and sell more crops is the *best way to combat global hunger and poverty*. ILO says that in order to do this, farmers in rural areas will need more sustainable and dignified means of food procurement (both in terms of production and economic accessibility).

**78% OF POOR PEOPLE
LIVE IN
RURAL AREAS**
AND WORK MAINLY IN AGRICULTURE.
THEY MUST BE LIFTED OUT OF POVERTY

Background

Agriculture has a central role in the rural economy of most developing countries, which means that rural employment entails mainly agricultural work. Of the developing world's 5.5 billion people, 3 billion live in rural areas and 2.6 billion are in households involved in agriculture. There is an *estimated total workforce of some 1.1 billion* in agriculture in rural areas of developing countries. Due to limited financial resources and lack of accessibility, many farms in these rural areas must function without modern tools and machinery. This makes the work much more strenuous and puts restrictions on how productive a farm can be.



Salient Characteristics

- 20 gallon bin holds more than the average worker carries
- Narrow design allows for use on fields without ruining crops
- Easily accessible compartments for farmers who do inter-cropping
- Design allows for produce to be moved easily reducing strain
- Handle design allows for better turning capability
- Scrap material allows for manufacture in most regions of interest

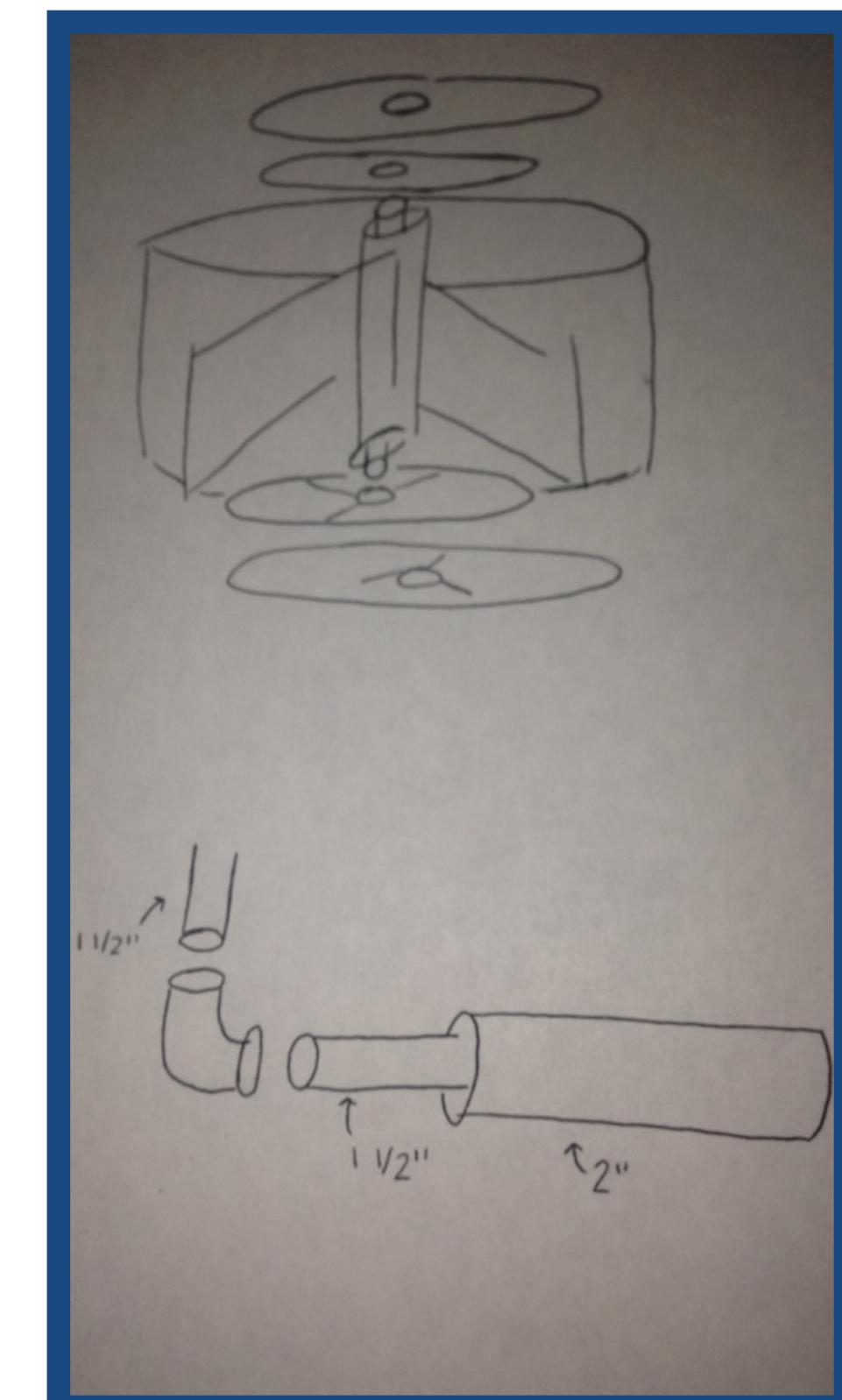


Existing Solutions

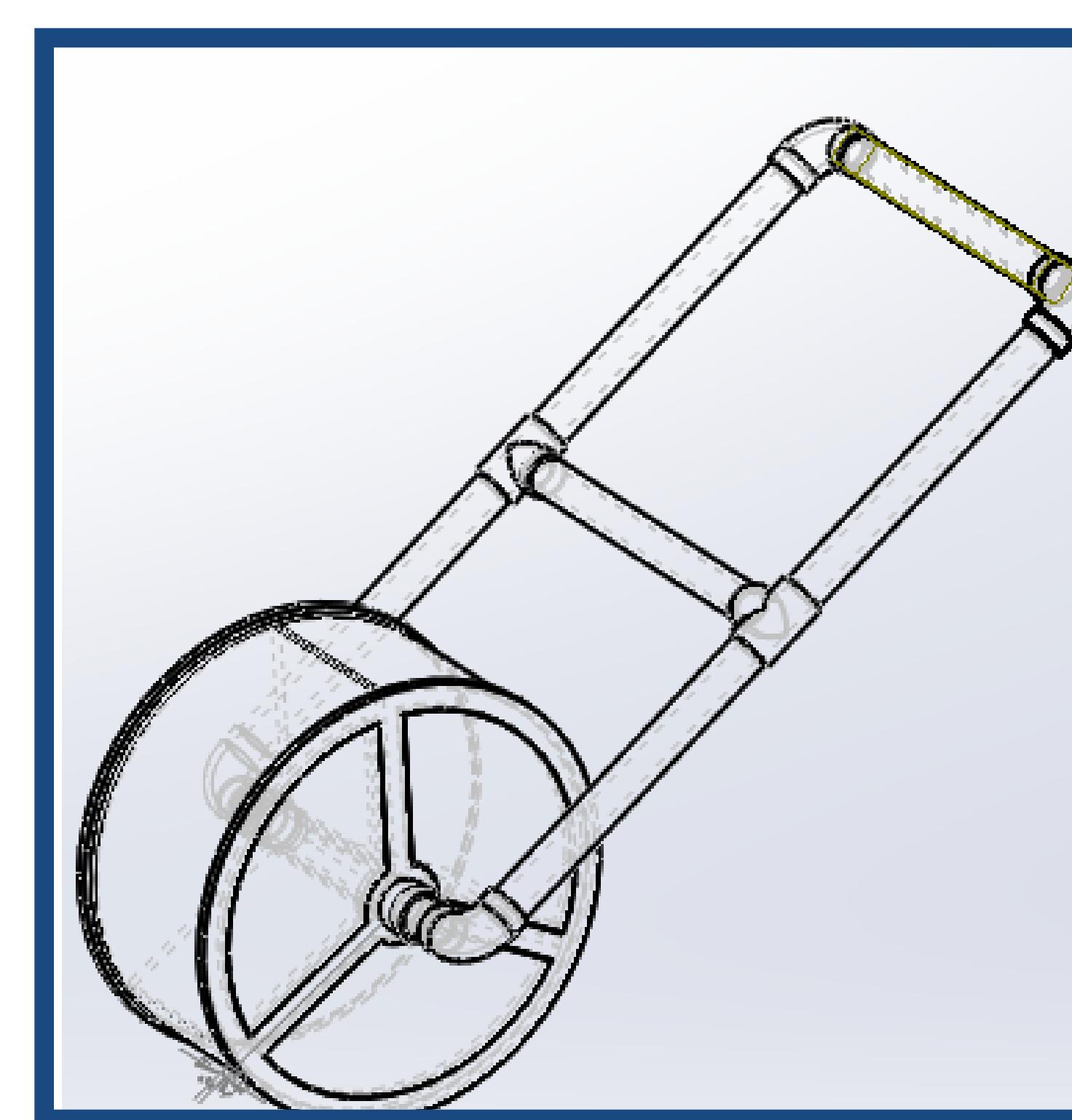
The most common method of crop collection on farms in developing countries is currently the manual carrying of buckets and bags full of produce to a central location from all over a field. Workers are constantly straining their muscles as they must transport everything by hand. The narrow walkways between rows of crops prevents workers from using other methods of transport. Our device was designed to fit through the rows of crops and allow workers to carry even more crops than they could before, with less physical exertion.



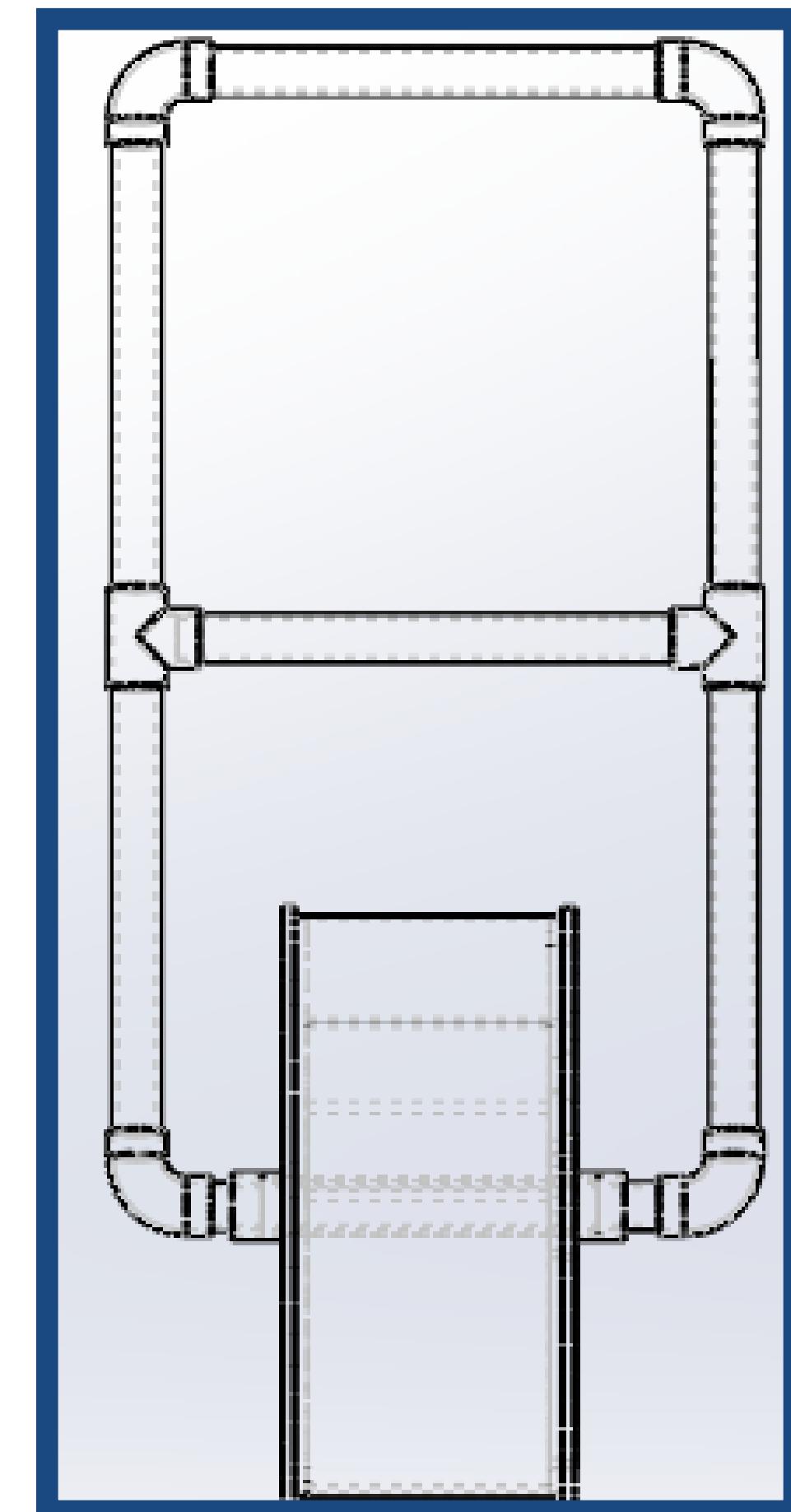
Completed prototype of device



Preliminary sketches of device above show initial handle and compartment design



SolidWorks renderings of final design



The three images above show our team building the prototype of our device in the Project Development Lab

What is next?

There are additional technical components and features that we would like to implement in prototype two:

- Rubber tread- We want to add a rubber tread to the outside of the device to lessen the risk of the middle piece not getting enough traction in snow or mud.
- Fillets- Stress concentrations in sharp corners can threaten the structural integrity of a device. We are going to incorporate fillets in place of all the corners of the compartments to ensure optimal strength.
- Bike Attachment- To make the device more adaptable and useful, we would like to add an attachment that secures the device to the back of a bike. This would allow the user to move their cargo more quickly over even longer distances.

Acknowledgements

A special thanks to Aaron Clark, a technician in the PDL, and Dr.Joe Tranquillo & Dr.Charles Kim for running KWIDE

Citations

All statistics courtesy of the International Labor Organization website