**Water Carrier Cart**

**Need**
In a study conducted by the Africa WASH and Disability Study (AWDS), over half of persons with disabilities report challenges when transporting water from the local water access point to their homes, a distance that averages to be 3.7 miles according to a report by the United Nations. This difficulty is not surprising as a single jerry can filled with water weighs between 40 and 50 pounds (the equivalent of carrying ten 2-liter bottles of soda).

During a prior phase of the project, the AWDS developed a bucket tipper which assists users when managing water in the home. A need for a water transportation device in addition to the jerry can tipper technology was identified.

**Proposed Solution**
The AWDS is working to develop a water carrier cart to help mitigate the difficulties associated with transporting water. This device will cost less than $15 USD and be manufactured by local artisans. Users will be able to adapt it to their preferences and physical abilities. The square tubing provides good sites of attachment for a variety of handle types.

**Future Work**
A site team will travel to Ghana this summer and deliver a prototype to selected World Vision communities. Feedback from customers, local artisans, and World Vision staff will be compiled and used by students on the AWDS to optimize the design for low cost and high quality.

By the end of the project, the AWDS aims to develop a water carrier cart that will aid persons with disabilities in leading independent lives and be manufactured and marketed by local artisans throughout the target regions in Africa.

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**Pump Handle**

**Need**
The AWDS identified the need to develop a handle for the India Mark II pump that considered the ergonomic aspects for users. The current handle is designed for users to stand behind it and grasp the rounded end of the long, slender bar. Since this can pose to be challenging, many stand to one side of the pump or the other and grasp the handle from there, resulting in less leverage and more required physical effort.

**Proposed Solution**
A pump handle attachment has been designed and tested by World Vision communities. The P handle design offers the option for users to pump from the side of the handle while minimizing the amount of additional material.

This design also allows communities to utilize a seat and superstructure designed by the AWDS. The seat is positioned at a 45 degree angle from the handle and provides persons with disabilities with additional support. Additionally, placing the seat off the side on an angle minimally affects users that prefer to stand at the end of the pump.

Although the attachment was designed with local material and machining capabilities in mind, ease and reliability of fabricating these attachments by artisans has been difficult. The material available is often less stiff than the prescribed design requirements. Tubing with the designed tolerance specifications can be challenging to find in country, resulting in an axial torque around the handle when the bolts and attachment become loose.

To mitigate this, some in-country modifications have been made. These have included the addition of a piece of square tubing with an additional screw behind the round tubing so that it extends to fit around the square cross-section portion of the pump handle.

**Future Work**
The AWDS is working with World Vision to develop a standardized water point access design that is disability-friendly. The wide-scale implementation of the P handle attachment would further aid in the goal of developing this standard that would be installed and maintained by World Vision. We are currently seeking to explore partnership opportunities with the pump manufacturer to discuss the possibility of manufacturing the P-handle attachments on a larger scale.