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Imvubu's Hippo Water Roller Facilitates Water Access in Rural African Communities

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Imvubu's Hippo Water Roller Facilitates Water Access in Rural African Communities

When it comes to water storage and distribution, rotomoulding technology is never far from the spotlight and the Hippo Water Roller project is no exception. For most of us the availability of clean water is something we take for granted even if we are occasionally inconvenienced by water restrictions. However, the relatively minor inconvenience of not being able to clean the car or water the garden is a far cry from the lives of millions of people in the developing world whose daily struggle for survival is dictated by the availability of fresh, clean drinking water. According to the World Health Organisation, 1.2 billion people have no access to any type of safe source of drinking water. Because of this, about 1.6 million people, mostly in developing countries, die every year from water-borne diseases spread through poor sanitation. Of the deaths, 90% are children under the age of five.

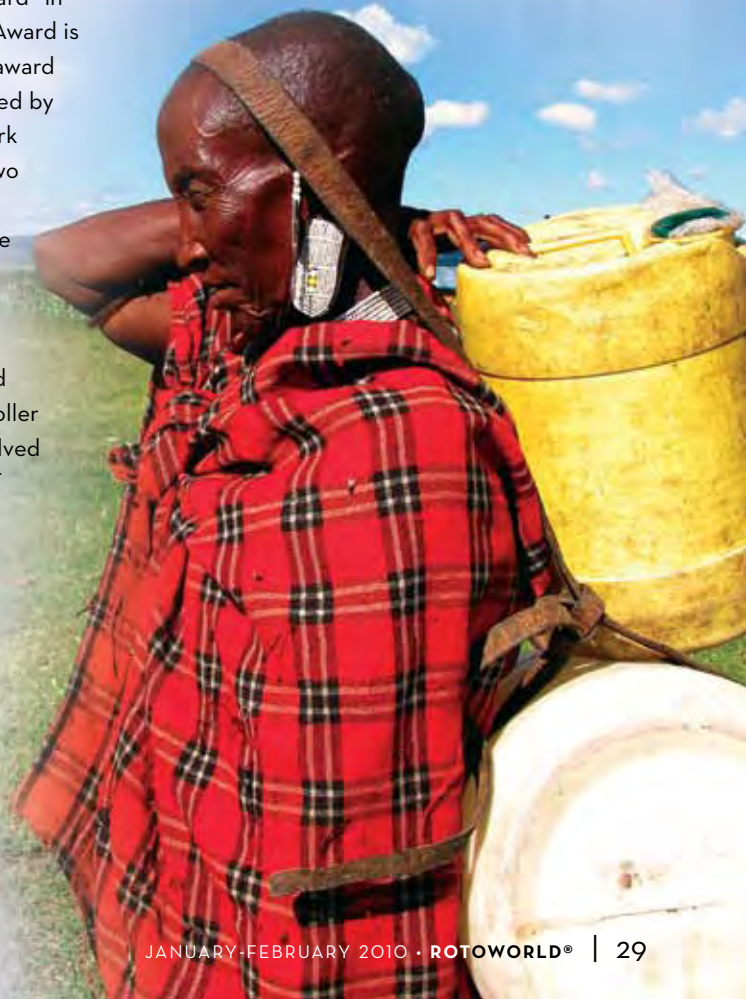




In many rural African communities water is carried for long distances by women in small, but heavy buckets on their heads. This method is time and energy consuming and the cause of many serious health problems, particularly spinal and back injuries. This hard, exhausting task also simply does not provide enough clean water to support their families. The Hippo Water Roller was designed to alleviate the problem. The barrel-shaped container holds, transports and stores 90 litres of water and is so easy to use that even children and the elderly are able to operate a full roller over any terrain. Approximately five times the normal amount of water can be collected in much less time and with far less effort, transforming water collection from a daily chore to an easier task performed only a few times a week. This translates into more time for other important household tasks and women are often empowered to start vegetable gardens and generate an income. Children also have more time to attend more school, improving their chances for employment.

The Hippo Water Roller, or "Aqua Roller", as it was known back in 1991, was originally invented by two South African engineers Pettie Petzer and Johan Jonker. Petzer and Jonker were working in the armaments industry at the time and used their engineering talents to develop a better way of transporting water over long distances. Growing up in a farming community, they saw an urgent need to find a better solution to transporting water. Their original concept was for a wheelbarrow with a low centre of gravity and they found that the most expensive component was the wheel. With some lateral thinking the idea was born to put the water "in" the wheel. The "Aqua Roller" received its first design award in 1992 - the "Cullinan Design Award" from the South African Bureau of Standards Design Institute. Then, as the "Hippo Water Roller", it received another design award from the SABS Design Institute in 1997 - the "Design for Development Award". In 2005, the Hippo Water Roller was finalist and Top Nominee in the "Index Design to Improve Life Award" in Copenhagen. This Award is the biggest design award in the world, financed by the state of Denmark and is held every two years. The Award is under the patronage of HRH The Crown Prince of Denmark.

Grant Gibbs, the driving force behind the Hippo Water Roller today, became involved in 1993, when the IT company (Infotech) he was working for at the time agreed to sponsor the project as a social responsibility project known as the Hippo Water Roller Trust Fund. In 1998, when





the company withdrew its involvement, Gibbs decided to go it alone and establish a stand-alone business entity, Imvubu Projects, to manufacture and market the Hippo Roller. Imvubu Projects is a classic social enterprise whose mission is to apply market-based strategies to generate sufficient profit to further their social and environmental goals. Imvubu is the Zulu word for hippo - a huge African animal threatened by loss of access to fresh water. The hippopotamus, Greek for "river horse", is recognizable by its barrel-shaped torso, enormous mouth, stubby legs and tremendous size (1.5 - 3 tonnes).

Much of the early design improvement can also be credited to the rotomoulder at the time, the late Piet Hickley of Protek in South Africa. The mould has an aluminium base bolted to a mild steel body - with a separate aluminium top. This very same mould, which was built by Mike Herald of Castec, is still in service today. Some interesting features were designed into the roller by Hickley, including a self-sealing screw cap.

This unique design incorporates a moulded-in O Ring. The cast aluminium lid moulds were also made by Castec. Peter Hickley's son, Nico, continues to mould the Hippo Water Rollers today - and the company has been renamed CHM Plastics. The company has had a long and important association with the Hippo Water Roller.

From its early inception, rotomoulding was seen as the only cost-effective way to manufacture the Hippo Roller. Blow moulded drums could simply not provide the impact strength, wall thickness and puncture resistance needed to withstand the constant abuse. Gibbs likens the design to an eggshell, where the stresses involved in moving the roller over an uneven surface are diffused over the entire product. The one piece, seamless design also contributes massively to the strength of the roller and makes it eminently suitable for the rural conditions for which it was originally designed. The durable and simple design of the roller ensures that little maintenance is





Containerised manufacturing units can be shipped by Imvubu to remote areas to manufacture the Hippo Water Rollers.

required. During development, a water filled roller was drawn behind a vehicle over a dirt road at 20 km/h for 15 km without any significant signs of wear on both the roller outer surface or pivot cavities. Now that the roller has been proven in the field for more than 15 years, its durability speaks for itself.

Typically the containers used by rural communities are either injection moulded chemical buckets or blow moulded chemical containers - with massive associated risks of contamination and poisoning. Not only does the Hippo Roller help eliminate this risk, but it was also designed with a very large opening so that it could not only be easily filled - but could also be easily cleaned when necessary. Unlike a blowmoulded drum, it is easy to get the whole arm inside the roller to thoroughly clean it out. The sealed lid is also recessed to enhance its protection.

The roller, designed to be pulled, has sufficient leg clearance, as well as pushed, which is considerably more comfortable. The firm steel handle gives the roller much more control when negotiating obstacles. If necessary, two people can comfortably walk side by side to pull the roller up a steep hill. The wide, flat rolling surface also makes it easy to pull through mud or soft sand. Unlike a wheelbarrow, the forces are not concentrated on a narrow point, but are spread out. This flat surface has the added benefit of not contributing to soil erosion, unlike wheelbarrows, which can create channels and grooves in the soil over time. The roller literally acts as a compacting device. The overall width of the roller with handle attached was determined by measuring the average width of a standard doorway and sized to allow it to be pulled through freely.

A unique benefit of pushing a Hippo Water Roller is that it has the potential to save lives in situations where land mines may be triggered. Demonstrations showed that when a water-filled roller was pushed over a land mine, it absorbed enough

of the blast to prevent hospitalisation of the person operating the roller, although bruising and cuts would still occur. In this way, the loss of limbs and possibly lives can be drastically reduced. The roller is rounded at the ends to simplify tilting to the upright position when wanting to pour from the full roller, which can be easily managed by one person. The roller is also very stable in the upright position when it rests on a small, flat surface - with little or no risk of the roller toppling onto a small child. The roller has hand-grips at the bottom and top to make emptying the container easier. A locating ring on the end of the rollers makes the rollers easy to stack.

One of the criticisms levelled at the design has been its one-piece construction and the associated long distance shipping costs. A two-piece, nestable design was seriously considered, but this was ultimately rejected as the structural strength was severely compromised. It just would not have stood up to the abuse. A better solution, when shipping the rollers to disaster zones or relief areas, is to use them as a packaging product and fill them with much needed supplies such as clothes, blankets, food or medical supplies. The rollers can be moulded in different colours, depending on the contents. Another solution being looked into is to establish mobile manufacturing units, which can be containerised, along with the raw materials, and shipped to the areas where the rollers are needed.

Gibbs has looked into the possibility of manufacturing the rollers from recycled polymer. However, while this is an option, and would provide best value in terms of donor funding, there is simply not sufficient recycled raw material available in South Africa. All available material is presently being sunk into septic tanks. The roller itself is fully recyclable, although in practice the units are used for many other purposes long after they break, for example as water troughs or food containers.

Future developments will include the incorporation of water purification and filtration equipment. While pills can be included, as in the case of a recent cholera outbreak in Zimbabwe, this is an expensive option and there is a need for ongoing purification. The inclusion of a filtration cartridge in the back of a second screw cap is being looked at as a possible option. This is a very important need as not only is water in short supply – but clean water is in even shorter supply.

Imvubu Projects has little or no budget to market the rollers. Marketing has literally been by word of mouth due to the intense interest and exposure generated by free publicity. A CNN International report featured the roller in 1996 and it has been featured in many TV shows since. Former South African President and Nobel Peace Prize Winner Nelson Mandela has met with Gibbs on two occasions and has given his endorsement and support for the Hippo Water Roller project.

While rural communities are the ones to ultimately benefit from the rollers, the project is supported by donor funding through corporate social responsibility programmes, non-governmental organisations and government agencies. 30,000 rollers have been supplied so far. It has been calculated that at least seven people benefit directly from each roller – and a lot more benefit indirectly.

Much positive publicity is generated for the sponsor by formal handover ceremonies to the communities, as well as from the subsequent media releases. At the handover ceremony, community leaders and invited dignitaries address the beneficiaries and sponsors are encouraged to participate.

Sponsors also have a significant opportunity to enhance their exposure by branding the Hippo Water Roller in corporate colours and having their logo permanently rotomoulded into the screw cap with Mold In Graphics® from Mold In Graphic Systems®. While media coverage and press releases give immediate publicity to the donor – Mold In Graphic® logos give the donor company a permanent and ongoing exposure and association with their project.

A recent such project was the UN World Food Program when a large quantity of Hippo Water Rollers was sent to the people of northern Somalia. The rollers were branded in corporate colours and UN-WFP Mold In Graphic® logos were prominently moulded into the screw caps.

The sponsorship programmes and handover ceremonies inevitably result in media attention, which has the added benefit of attracting attention to the community, putting them “on the map,” which results in other needs being met like roads, transport and medical services. As Gibbs says, “The net result of introducing appropriate technology like the Hippo Water Roller is far greater than just improved access to water”.

Grant Gibbs is introducing the Hippo Water Roller into other parts of the world. Although he is happy to work with rotational moulders, his vision includes working with NGO's and similar organisations, which are already involved in aid programmes. He will help them to establish stand-alone manufacturing units in remote rural locations, where the rollers are most in need. For further information, please see www.hipporoller.org.

