AGWATER SOLUTIONS
Improved livelihoods for smallholder farmers

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*This briefing note summarizes the preliminary case study findings for discussion and comment*

# WATER LIFTING IN GHANA

*Based on a report by Regassa E. Namara*

***Making motorized pumps more affordable and easily available would dramatically improve the productivity of famers in Ghana's poorest areas.***

## The Opportunity

In 2008 there were around 1.85 million farm households in Ghana with an estimated average of 1.44 ha of potential irrigable land per household. This amounts to an area of 2.35 million ha that could be irrigated if adoption of agricultural water management technologies, including small motorized pumps, is increased and the adoption rates are sustained.

In the dry season, vegetables dominate the cropping pattern of farmers using water lifting technologies, whereas cereals are the main crop of canal irrigators. The most significant irrigated crops are pepper, okra, rice, onion, tomato, maize and eggplant, respectively, in terms of acreage. These crops together constitute over 90.5% of the total irrigated area during dry season.

During the wet season farmers can grow a wider variety of crops. Farmers using buckets for irrigation or a combination of buckets and motorized pumps grow maize, tomato and onion. The major difference between them is that those using motor pumps are able to grow significantly more vegetables alongside these crops. Those who rely solely on their motorized pumps grow three major crops: maize, okra and onion. Generally, vegetables occupy a significant percentage of cultivated area during the wet season as well, although at a much lower level than in the dry season.

*A motorized pump allows the farmer to irrigate more effectively.*

## Motor Pumps in Ghana - Fast Facts

- Male farmers dominate pump ownership, buying decisions, and the overall control over use.
- Vegetables dominate the cropping pattern of farmers using water lifting technologies, whereas cereals dominate that of canal irrigators during dry season.
- It is estimated that there were nearly 170,000 petrol/ diesel pumps in Ghana in 2009 .
- Crop yields during the dry season are significantly higher among motor pump users.
- Farmers using motorized pumps are more likely to have other sources of income such as salaried employment.
- Motor pump use increases amongst farmers with higher education levels.
- Most farmers continue to use a bucket in tandem with a motor pump, both as a fallback when fuel or power is short and as a more appropriate method of irrigating seedlings and young plants.

## The Research

The AgWater project ran a study on water lifting technologies using information from farmers about their crops in 2008/2009. The research was designed to determine if farmers in Ghana were irrigating their crops and how they were doing it. It also analyzed which technologies would improve crop yields and what can be done to help more farmers benefit.

The research took the form of a hut-to-hut census of 12,620 farm households in 20 districts covering the southern and coastal zones, the semi-deciduous and transition zones, and the savanna agro-ecological zones of Ghana. From this, 494 farmers from the Ashanti, Greater Accra and Volta regions were randomly selected to carry out an in depth survey.

## Main Findings

The adoption rate of water lifting technologies does not seem to be determined by farm size. Rather, most famers have land which can be improved by using water-lifting technologies. The principal constraints are lack of finance, the unreliability of water sources, and the high cost of labor.

Only 16.3% in the sample relied on rainwater only or have no other access to water. The remainder usually have a water source less than a kilometer away. Groundwater is rated as the most reliable source and rainfall, not surprisingly, is unreliable. The majority of farmers spoken to believe their water source belongs to them, a view which is diametrically opposed to the official water rights policy in Ghana. Farmers using water lifting technologies are more likely to be younger (in the Ashanti and Greater Accra regions) or better educated (especially in the Volta region). Pump owners are more likely to be men, while women tend to be better represented when it comes to access to public irrigation systems, which may be due to deliberate government intervention.

*A simple motor is all that is needed to improve access to water.*

Farmers from all areas have diversified and earn income from a number of different sources such as unskilled labor and artisanal activities like tailoring and hairdressing. The proportion of farming households with regular salaried employment is significantly higher among those with access to water lifting technologies.

Fertilizers, seeds, herbicides, pesticides and other materials are usually available within a reasonable distance of the farm, but this is not the case for equipment. A considerable number of farmers reported buying their motorized pumps from outside Ghana and many farmers rent rather than buy. Pump imports for agricultural use are exempted from certain taxes which means the total tax payable amounts to just 3% instead of 18.5%.

However, the processes for getting these exemptions are cumbersome and lengthy and it is debatable if these tax deductions are reflected in the actual price farmers pay for their pumps. Most farmers use their own cash and those who resort to credit usually borrow it from informal sources such as market women at significantly high interest rates. In some cases, a loan will be advanced on the condition the farmer agrees to sell back their crop at a predetermined price, or they may be required to repay their loan in kind.

The majority of the vegetable farmers (78.4%) sell their produce at the farm gate at an extremely low price, particularly in the Volta region. The variability in prices is high, especially for the vegetable crops during the wet season.

However, as expected, dry season crop prices are generally higher with relatively low variability. Water lifting technologies are particularly relevant to farmers where their crops can be processed for the final market. Maize and rice milling are the most common examples in this sample.

Treadle pumps have started to disappear as more and more farmers turn to motorized pumps, particularly in conjunction with buckets. Overall, the conclusion was that motorized pumps were more productive in terms of higher gross margins per hectare, than bucket and gravity methods in both wet and dry seasons. However, although the majority of the sample farmers have known about petrol and diesel pumps since the 1980's and electric pumps since the 1990's, this has not led to their widespread use.

## Solutions

- Improve the supply chain of pumps by drafting registries of existing importers, dealers, and retailers, and potential after sales service providers.
- Institute a product quality assurance system.
- Incorporate basic technical training on small motorized pumps into the agricultural syllabus of schools.
- Prepare a training manual for use by dealers, retailers, extension professionals, maintenance service providers and farmers.
- Help farmers get the most out of their pumps by offering training on pump selection and maintenance, crop selection and agronomic practices, the handling of crops after harvest and the marketing of produce.
- Communicate the benefits of water lifting technologies through policy briefs, farmers' field days and mass media.
- Provide access to affordable loans on reasonable terms or improve the financing mechanism.