

AFRICA WINDMILL PROJECT

Annual Report 2020

The year 2020 has been a difficult year not only for Africa Windmill Project but for the entire world. The COVID 19 pandemic has affected the work that AWP does in significant ways. For instance, AWP offices remained closed for a full month within the year and field work was halted during that month. Funding was another area that was greatly affected because economic activities were shut down not only here in Malawi but in the United States of America and the entire world. However, despite all of the challenges that AWP went through, a number of great activities have taken place over the year which all stakeholders can celebrate and learn from.

Our focus on irrigation technologies has the potential to transform the history of irrigation agriculture in Malawi, starting with Lilongwe district. Farmers are beginning to differentiate irrigation using watering cans and buckets and irrigation using rope and washer pumps and windmills. When one interviews the farmers, they clearly differentiate between the old way of doing irrigation and the new way of irrigation which uses rope and washer pumps and windmills. Now with a lot of farmers using AWP irrigation technologies it is interesting to see how irrigation farming is going to transform in the villages.

The other exciting area of Africa Windmill Project's work in 2020 entailed working with partners in different areas of their work. In the course of the year, AWP worked with Lilongwe University of Agriculture and Natural Resources (Bunda Campus) in the area of windmill research. Secondly AWP with World Relief Malawi in Salima district where two windmills have been installed for groups of farmers. Apart from World Relief Malawi, AWP has also worked with Werengani Ministry in Nkhotakota where one windmill has been installed and plans are underway for the installation of a second windmill. In addition, AWP partnered with Honorable Monica Chang'anamuno Member of Parliament for Lilongwe North Constituency. Working with partner has taken the work of AWP to places where the organization could never have reached. This is obviously an area that needs to be developed further.

Lastly this year AWP introduced a spiritual component to the agriculture and food security work that the organization is doing.

1. INTRODUCTION

1. Vision

Africa Windmill Project (AWP) envisions being the leading non-profit organization in sustainable irrigation techniques for vulnerable local farmers.

2. Mission

Our mission is to empower farmers with irrigation tools, knowledge and skills that would help them improve their crop productivity with an aim of transforming their livelihoods. We strive to teach rural farmers to produce food on a sustainable level using technologies that can be accessed by rural farmers.

3. Project Goal

To achieve food security and self-reliance of vulnerable households by increasing their crop productivity through access to irrigation tools, knowledge and skills.

4. Project Objectives

1. To increase resilience of vulnerable households to food insecurity through access to sustainable irrigation technologies.
2. To enhance availability of capital for irrigation and rain fed cropping seasons.
3. To promote business culture among vulnerable households.
4. To improve windmill efficiencies through research.

5. Project Area - AWP works with farmers in Lilongwe, Salima, and Mchinji and Nkhotakota districts in the Central Region of Malawi.

6. Justification

Climate change requires farmers to be proactive about increasing food production. The potential for droughts is even greater, farmers must learn to adapt to stress and shocks due to this. Most families in Malawi have small to medium sized plots (1-2 acres) of rain fed crops as well as irrigation plots (0.3-1.2 acres) yet most households are between medium to large families (6-10 members). These small rain fed plots together with poor agriculture practices and poor planning lead to household food shortages every year. In addition, most farmers prefer tobacco to maize expecting to sell tobacco at better prices so that later they could buy maize for food, unfortunately over the past four years tobacco prices have been very poor leaving most families food insecure. In addition, most farmers decide to sell their farm produce including dry maize soon after harvesting, during which dry maize is in abundance and prices are very low. To cope with food shortages, farmers go for small scale irrigation farming using watering buckets to irrigate their crops. This is because watering buckets are affordable and appropriate for small-scale farming or backyard irrigation gardening. However, the method of irrigation with watering buckets poses many challenges of irrigation for these smallholder farmers. Notable challenges with use of watering buckets include limited area of irrigation, body pains, tiredness, taking too much time to irrigate and low volume of water applied to crops per unit time. Irrigation with rope and washer pumps and the renewable energy technology (windmills) offers the possible alternative to shift from use of watering buckets. Rope and washer pumps are very simple, but effective method for making water available to crops. They are easy to handle and there is no need for sophisticated equipment. They can be used in almost every area to irrigate larger plots (0.4 acres) than one could do with a watering bucket (0.1 acres). Africa windmill project also provides windmills which irrigate a larger plot than a rope and washer pump.

7. Project Background

The project was established in 2015 in Mngwangwa and 2017 in Chigonthi EPA. It started with 350 farmers as direct beneficiaries and 450 farmers in Chigonthi, now the project is working with over 3500 households impacting over 13000 people both directly and indirectly. While in Mchinji our work surrounds the efforts that Mr. Japheth Kalimba is doing in Chimteka village. In Salima Africa Windmill Project is working in partnership with World Relief Malawi and there the organization reaches out to 35 farmers. Lastly in Nkhotakota, AWP is working with Werengani Ministry which provides services to communities.

WORKSHOP

1.1.1. Fabrication and Installation of Water Pumps

The workshop is responsible for fabrication, Installation and maintenance of water pumps. Farmers are given proper Irrigation technics either rope pumps or windmills. They are also trained the use and maintenance of the pumps and Irrigation systems. Africa Windmill Project planned to produce 25 windmill and 500 rope and washers. Due to other limitations, only 16 windmills and 300 rope and washers have been produced. Out of 25 windmills, 16 have been installed and 10 completed 6 incomplete. Out of 300 rope and washer pumps produced, 144 are still in stock at the workshop while 202 have been handed over to farmers.

Table 1. Number of rope and washer pumps in various clubs

No	Name of club	Section	Rope and washer pumps
1	M'buka	M'bang'ombe	12
2	Chimpando	Chitukula	2
3	Matowe	Chitukula	1
4	Chibwata	Mlubwira	3
5	Tithandizane	Mlumbwira	1
6	Kachonde	M'bang'ombe	1
7	Umodzi	Mlubwira	1
8	Mteza	Chigonthe A	5
9	Mteza B	Chitedze	2
10	Kabila	Chilitsi	7
11	Tithandizane	Mlezi	2
12	Chinyama	Chilitsi	1
13	Tikondane	Chitedze	11
14	Mawandiwe	Mlezi	5
15	Mango	Chitedze	22
17	Tilimbike	Chilitsi	12
18	Kanyendera	Chigonthe B	3
19	Chipeni	Madika	1
20	Talandira	Chilitsi	2
21	Phazo	Chilitsi	3
22	Chimpumbulu	Chibade	5
23	Kanama	Chibade	2
24	Makumba	Mlumbwira	5
25	Zonde	Mlumbwira	2
26	Madziabango	Chigonthe A	2
	Total		113

1.1.2. Chigonthi EPA - Windmills

No	Name of farmer	Name of club	Section	GPS coordinates	Type of pump	Status
1	Mercy Kamdambo	Phazo	Chilitsi	-13.721086, 33.698994	Pressure	Completed
2	Debora Chaguzika	M'buka	M'bang'ombe	-13.751482, 33.714967	Pressure	Completed
3	Daniel Kamenya	Mteza B	Chitedze	-13.713016, 33.734897	Lift	Completed
4	Steven Mphadwe	Chimoza	Mlumbwira	-13.780060, 33.695838	Lift	Completed
5	Haiford Dakashoni	M'buka	M'bang'ombe	-13.749910, 33.716591	Pressure	Completed
6	Yohane Patisoni	Mwambakulu	Chilitsi	-13.729904, 33.715453		Incomplete

1.1.2.2. Chigonthi Rope and washer pumps

60 Rope and washer pumps have been distributed this year at Chigonthi

1.1.3. Mngwangwa EPA - Windmills

No	Name of farmer	Name of club	Section	GPS coordinates	Type of pump	Status
1	Chimphanje Chiputu		Mngwangwa		Pressure	Completed
2	Andrea Marko		Maselero		Pressure	Completed
3	Banda Chisale		Chipokosa		Pressure	Completed
4	Bonifesi Sadalaki		Kambulire 2		Pressure	Incomplete
5	Kazembe		Kambulire 2		Pressure	Incomplete
6	Chidothi		Chipokosa		Pressure	Incomplete
7	Hardwell Balafuta		Lombwa		Pressure	Incomplete

1.1.3.2. Mngwangwa Rope and washer pumps

102 rope and washers distributed at Mngwangwa.

1.1.4. Water pumps with stakeholders - Windmills

No	Name of farmer	District	Village	GPS coordinates	Type of pump	Status
1	Werengani Ministry	Nkhotakota			Pressure	Completed
2		Nkhotakota				Incomplete
3	Denis	Mchinji	Benjamin		Pressure	Incomplete
4	Bunda Campus	Lilongwe	Eng. Department		Pressure	Complete

1.1.4.1. Training of Community Technicians

When farmers receive pumps, they need knowledge of maintenance to sustain their operations. AWP has trained 8 community technicians selected among the farmers to be doing the routine maintenances of all the pumps in Salima district. The technicians have been given the basic tools and trained to take this as a skill which can help them earn income as well.

Training on AutoCAD 2D - The project manager and two field coordinators have do training in AutoCAD to help them produce 2D computer aided drawings and also have knowledge to interpret AutoCAD existing drawings. This is one of the trainings waited for a long time among others coming in the year 2021 with the reputable government institution NCIC. Now AWP staff members are geared to improve the standards to meet requirements at national and international level hence achieving the organization growth as well.

1.2. MNGWANGWA

In 2020 the team responsible for Mngwangwa EPA conducted Lead Farmer and Extension workers refresher training, sensitization, distribution of rope and washer pumps, famers' educational visits and participatory evaluation. Despite the challenges that they faced, they managed to achieve the following:

1.2.1.1. Rope and Washer Pump Distribution

The plan for this year was to distribute 250 rope and washer pumps in the project area. In January and February, the focus was on making rope and washer pumps to be distributed to Mngwangwa and Chigonthi respectively and 300 pumps were made. However, everything changed with the outbreak of the Corona pandemic. Out of the 250 pumps planned only 102 rope and washer pumps have been successfully distributed to farmers.

1.2.1.2. Windmill Installation

Ten new windmills were planned to be installed in Mngwangwa this year however not all the ten pumps have been installed. Seven windmills have been installed, three of which have been completed and are operating while four other windmills have been partly installed to be completed next year.

1.2.1.3. Crops

Crop management was greatly affected early in the irrigation season due to disruption in supply of pesticides on the market as a result of COVID 19 outbreak. With the help of AWP management pesticides were sourced from other locations which assisted in saving some of the crops which were being damaged by fall army worms. In addition, the preferred seed that farmers use in irrigation was also missing in most agro-dealer shops in villages as a result most farmers decided to wait until other seed and pesticides would be available on the market to avoid loss of crops. However, from June through to December with the help of AWP staff most farmers planted the seed of their choice and irrigation farming gained momentum. Different clubs have performed differently this year in fact the variance in term of crop production was too big. While crop production decreased drastically due to effects of the pandemic in other irrigation sites, some sites had produced more crops than ever before and so were the income. In fact, those clubs that did perfect irrigation in terms of quality and quantity have received more new irrigation members joining the project following their success stories.

1.3. CHIGONTHI

In 2020 the team responsible for Chigonthi EPA conducted Lead Farmer and Extension workers refresher training, sensitization, distribution of rope and washer pumps and famers' educational visits. Despite the challenges that they faced, they managed to achieve the following:

1.3.1.1. Extension Workers and Lead Farmers Training

From 28th to 31st January 2020, Africa Windmill Project conducted a training for Extension Workers and Lead Farmers in Chigonthi EPA. The extension workers training was done on 28th-29th January while lead farmers training was from 30th – 31st January. Extension workers and lead farmers training took two days each. One day for theory and another one for practical work. A total of 10 extension workers and 22 lead farmers were trained. The aim of the training was to train extension workers and more lead farmers to act as promoters of technologies in the village and mobilize the community to easily adopt AWP technologies. This was to ensure project sustainability through the knowledge that was imparted.

1.3.1.2. Plot Lay out

Early this year before the peak of COVID 19 pandemic, farmers were being trained on making of irrigation basins together with irrigation canals for water distribution to crops. In March this year the number of COVID 19 patients increased and this caused the government to call for a lockdown. For this reason Africa Windmill Project was closed for the month of April.

1.3.2. Distribution of Rope and Washer Pumps

Based on a survey that was conducted in 2019, 183 farmers had wells that are fit for irrigation with rope and washer pumps. These farmers were supposed to receive rope and washer pumps but only 60 farmers have received these pumps. This has been so because the requirement for a farmer to receive a rope and washer pump in this year was that he/she must first of all make irrigation basins and canals before receiving a rope and washer pump. However, many farmers had already planted their crops before making irrigation canals hence they had to wait until they would harvest and make irrigation canals. The table below shows the number of rope and washer pumps in different clubs.

1.3.3. Installation of Windmills

Six windmills have been installed in Chigonthi EPA this year. Five out Six windmills are working while one is still work in progress. The table below shows names of farmers who have received windmills.

1.3.4. Visits to Chigonthi EPA

A number of visitors came to Chigonthi EPA to appreciate the work that is being carried out by Africa Windmill Project. These visitors included Honorable Chang'anamuno, farmers from , Ukwe EPA in Nsalu, World Vision team, Mr. Nyasulu and Mr. Malasa.

1.3.4.1. Honorable Chang'anamuno

Honorable Chang'anamuno came with her friend Honorable Liana Kakhobwe Chapota. They saw how rope and washer and windmill pumps work for irrigation farming. From that visit Honorable Chang'anamuno mobilized farmers of her constituency to come to Chigonthi EPA to learn more about irrigation farming with rope and washer and windmill pumps. A total of 25 farmers and 1 extension worker from Ukwe EPA were trained. The training took two days, one for theory and another for practical learning from a fellow farmer who is well experienced and successful in the use of a rope and washer pumps Mr. McOcean Jamo. Farmers in Ukwe EPA are using the rope and washer pumps successfully. The only challenge was that they had already planted crops before they received the pumps as a result it was difficult for them to make proper irrigation canals.

1.3.4.2. Mr. Nyasulu

Another visitor who came to Chigonthe EPA is Mr. Nyasulu who is a retired Project Officer in the Ministry of Agriculture. He has land where he would like to be doing irrigation farming. Mr. Nyasulu would like to buy a windmill; therefore he went to Chigonthe to see how windmills work to better make a decision before purchasing one.

1.3.4.3. World Vision Team

The World Vision Malawi team visited Africa Windmill Project in Mngwangwa and Chigonthe EPAs in August 2020. Five gardens were visited these are: Grace Chiweza's garden at Suntche, Steven Mphadwe's garden at Chipasula, Golombe Kalafumbwa's garden in Chitedze, Layitani Zakeyo's garden and McOcean Jamo's gardens at Chitedze and Michael Kayiyatsa's garden at Guzikonde. From what the team saw, they were impressed and would like their organization and Africa Windmill Project to partner so that farmers in World Vision may also benefit in the use of wind for irrigation farming.

1.3.4.4. Mr. Malasa

In October, Mr. Malasa who is also the AEDC (Agriculture Extension Development Coordinator) for Chigonthe EPA visited some windmill sites in Chigonthe EPA. Seven farmers were visited including Golombe Kalafumbwa, McOcean Jamo, Layitani Zakeyo, Daniel Kamenya, Haiford Dakashoni, Michael Kayiyatsa and Steven Mphadwe. He encouraged farmers who have received windmills and rope and washer pumps to continue working hard. This also helped the AEDC to have updated information about windmills and rope and washer pumps in his EPA.

Partnerships - Africa Windmill Project has worked with a number of partners in the course of the year. Here are some highlights of the progress made so far:

1.3.5. Lilongwe University of Agriculture and Natural Resources -Bunda Campus

This is a partnership based on research purposes between the two parties of the technologies Africa Windmill is using for its project implementation. Currently, a windmill designed by AWP has been installed which is being studied by the Engineering department in a number of areas. Data collection is still underway and they are yet to share partial results of the underway study early 2021.

1.3.6. Werengani Ministry

AWP partnered with Werengani ministry in Nkhotakota. The partnership got to a point of having almost two windmills installed in Nkhotakota which is the project area for the ministry. Due to time limitations, AWP managed to finish installing one windmill which is helping the area to irrigate a garden where kids get their vegetables for their junior day school.

1.3.7. Dennis Milala

This is an individual owned windmill under Mr. Dennis Milala in his village whereby his parents and other relatives will benefit from it through irrigation. Installation has just started plans are under way to finish the installation early 2021. **** (This windmill was funded from a friend of theirs in Europe, in lieu of wedding gifts donations were made for this windmill) **kjd**

1.3.8. Honorable Monica Chang'anamuno

Forty rope and washer pumps have been distributed at Ukwe EPA in partnership with Honorable. Monica Chang'anamuno MP. In her manifesto she promised to help the communities in her

constituency to become food secure and economically empowered. This is why she chose AWP to be a partner in achieving this goal. AWP is planning to continue with the partnership in the year 2021.

1.3.9. World vision Malawi

A team of Agricultural experts from World Vision Malawi visited Africa Windmill Project in Mngwangwa and Chigonthi EPAs in August. It is important to point out that this initiative started with representatives of both organizations in the United States of America. The discussions are at an advanced stage, at the moment AWP has already filled in due diligence forms as requested by World Vision Malawi. There is hope that the two organizations are going to agree to work together in the irrigation sector.

ADMINISTRATION

1.3.10. Staff Welfare

Members of staff agreed to start contributing K500 every month to cater for some needs that staff have. All members of staff agreed to the idea and they committed to making the monthly contributions. Each time a member of staff was sick, was bereaved or a member of staff had a baby representatives visited them with a little something.

1.3.11. Set of Furniture for the Reception

The reception is one of the most important rooms at the office. This room gives the first impression to visitors who come to AWP for different reasons. The reception now is furnished with a bamboo set of furniture.

1.3.12. Purchase of Tent and Air beds

Commuting to the field on a daily basis consumes time for staff. Each and every day staff takes around two hours or more for them to travel to and from the office to their place of work. Reducing this time would mean increasing productive time for teams in the field. The administration therefore decided to procure a tent and airbeds that the team will be using in the field to help them maximize on the use of their time during windmill installation.

1.3.13. Transport

The office has grappled with transport for some time in the course of the year. The Condor and Mazda are both very old models which are no longer on the market. This means that each time there is need to replace a part the search becomes so extensive because these models are no longer on the market. As a solution there is need to purchase newer versions of field vehicles that suit the type of roads that we use.

1.3.14. Strategic Management, Policy Development and Information Management System.

There are a number of things that were supposed to be done in the year 2020. These are very important and will transform the way of doing things in the organization. The three items will be carried over to 2021.

1.3.15. Staff Accident

Two of AWP's staff were involved in an accident, one sustained a fracture on one leg. The team could not work as expected because they needed time to recover. In addition the office will be required to offer some compensation. As a way forward the team will be undergoing a safety training early 2021.

1.3.16. Corona Virus Disease 2019 (COVID 19 Pandemic)

The COVID 19 pandemic had a significant effect on the work done by AWP in 2020. For instance, offices had to shut down for a whole month. Our borders were also shut down for months and supplies could not come into the country. The lockdown resulted in the scarcity of the much needed seeds and insecticides that farmers use. The AWP team purchased insecticides that farmers were getting from the office. The team searched for the chemicals and farmers would easily get them from AWP at a breakeven price.

3. PROJECT RESULTS AND IMPACT

3.1. Food Security

Household food security of many farmers has improved as a result of the irrigation project. Results from this years' evaluation indicate that more than 80% farmers buy household food soon after selling their irrigation produce in the first and second irrigation seasons. And in the last irrigation season of the year which is from October to January majority dry their maize primarily for household food. Initially from 2015 through to 2017 when one met farmers in August to March they would complain of hunger. In fact, they would ask for personal assistance, they had nothing to eat and the situation was getting worse as time went by until March when they would eat fresh maize and pumpkins from their rain fed gardens. However, during evaluation done in November and December in 2020 no one complained about hunger but all were stories of number of maize bags bought from irrigation proceeds to take them through April next year.

3.2. Reduction of Poverty

Diversified household income generating sources is another area that the project has greatly impacted. The capital farmers get when they have sold their different irrigation produce and the entrepreneurship lessons that are taught to farmers have together contributed positively to the business culture that most of them have adopted now. While some farmers do business as a way of saving their money, others do business from a different point of view. By building mutual relationship between two or three businesses some farmers have become more stable in irrigation farming than before and are able to sustain all businesses at the same time.

3.3. Health and Education

Education and health have also improved in one way or the other. There are farmers who no longer struggle to buy school uniforms for their children, pay school fees. Even primary school children had issues of school uniform and development fees which were very challenging to parents. Children would miss classes for quite some time because parents did not pay development fees or they could not write end term exams because parents were unable to pay examination fees. However, these are no longer issues that give headache to irrigation farmers because one can simply sell a chicken and the money would cover development fees and other things. In terms of health fresh maize is available almost throughout the year and one would find children enjoying with the same. The chickens give farmers access to eggs, they can easily buy meat and they grow vegetables which help maintain a healthy diet.

3.4. Planning, Budgeting and Saving in Advance towards Inputs

In a normal circumstance where farm inputs are available at the market, farmers easily buy inputs without problems. Initially the majority were dependent on starter inputs however many farmers now are

able to buy their own inputs. As the benefit of irrigation farming reach many households irrigation acreage is also automatically increasing to match with new plans in each season.

3.5. Improved Social-Economic Status

More and more development projects are being done by farmers ranging from simply buying a small solar panel for home lighting to advanced solar system for barber shops and cell phone charging. In addition farmers are buying new residential plots, building new and better houses, own new and better modes of transport including motor cycles and ox-carts.

3.6. Spiritual Life

This year the most outstanding thing done was sharing the gospel of our Lord Jesus Christ with farmers. Having focused much on farmers physical needs for years AWP decided to also consider spiritual lives of farmers. It was really great because farmers joyfully received the word. However the sharing was stopped in the process following Corona virus preventive measures. In fact, the majority ask for Bibles to continue reading in their homes.

3.7. Environmental Conservation

The pumps that Africa Windmill Project promotes are environmental friendly. These pumps do not depend on fossil fuels to run. Windmills and rope and washer pumps do not emit Chloro Fluoro Carbon (CFC) gases which are very hazardous to the environment.

4 did you get what was delivered yeah I'm just wondering so if you could let them know if that's what you are you say. CONCLUSION

The year 2020 has been a very difficult year for Africa Windmill Project just like it has been for many other institutions. COVID 19 has changed the way business was done and new coping mechanisms have been embraced. It is interesting to see that there is great progress that has been achieved amid the COVID related challenges. Members of staff have adapted to using face masks and using sanitizers and washing hands frequently. It is encouraging to note that despite the challenges in 2020, ten windmills have been installed and 6 are almost half way through. Over 300 rope and washer pumps were made and out of this number over 200 pumps have been distributed among AWP farmers and about 30 have been procured by a Member of Parliament from Lilongwe North Constituency who has already given the pumps to farmers in her area. AWP has partnered with a number of organizations which is a way of multiplying efforts that the team is doing. Another area of interest has been the research that AWP is doing with Lilongwe University of Agriculture and Natural Recourses which will bring improvements on the windmill. The team also introduced devotions during farmers' meetings and trainings. Great results so far have already started to come out. Farmers who had stopped going to church over 30 years ago have gone back to church and some farmers who never had a Bible of their own have taken their own money and have purchased their own Bibles.