

*Improving Agricultural Production Using Floodwater;
From Disasters into Opportunities.*



By Macpherson Nthara

Spate Irrigation Champion - Malawi

Context and Background

The need to increase agricultural production is one of the top priorities for the Malawi government. However, the majority of farmers in Malawi are small holder. Food production at that level is hampered by the vagaries of climate. The impacts of climate change on agriculture have been severe in the 2015/2016 cropping season in which floods and dry spells have been widespread throughout the country. Growing agriculture through enhancing production and productivity in irrigation based small-scale farming is seen as an important strategy to respond to the challenges.

Floods are an annual occurrence in several parts of the country leading to massive damage to infrastructure and crop fields. The current notion among Malawians is that floods are a disaster. There is need to change the mindset so that floods are viewed as an opportunity. Travelling through several flood plains in Malawi, it is clear that there are no engineer - designed structures for harnessing and utilizing flood water for crop production. However traditionally, farmers deliberately locate their cropping fields in areas which are inundated by floods so as to advantage of the residual moisture to grow Maize and rice. Flood recession agriculture is widespread in the Northern Part of Malawi in districts of Karonga, Nkhosha and Salima in the Central region and along the Shire Valley in the Southern Region. Therefore traditional practices exists and farmers use indigenous knowledge to grow crops using flood water.



Maize production adjacent to ephemeral streams takes advantage of occasional flash floods. No diversion structures or canals.

Challenges and Opportunities

Malunga (2009) reported that flood recession agriculture, river diversion and the use of treadle pumps are the most common water management practices used by farmers in the Shire Valley. Flood recession agriculture is used to grow sweet potatoes, although the practise receives no attention from government or NGOs. Among the problems observed were the farmers' inability to afford inputs, promotion of unsuitable technologies, and government controlled market prices. Government departments and NGOs were promoting treadle pump technology (mostly) and river diversion, but not recession agriculture. This shows that there is a significant lack of knowledge on the practice of flood recession agriculture.



Ephemeral Stream Flowing after a rainstorm in the highlands (Central Malawi)

Land degradation in the highlands has resulted in high silt loads in what used to perennial rivers flowing downstream. As such most of these rivers have changed from being perennial to being seasonal and ephemeral. For example in the Lower Shire Valley (Harrison, 2010) noted that the challenges of siltation downstream are seen by many to be due to unsustainable cutting down of trees for charcoal and stream bank cultivation in higher districts of Thyolo and Mulanje. There is reportedly a lack of communication between the upland and downstream district authorities on the matter.

Due to limited attention from government departments, the construction of diversion structures and canals to divert short term flash floods is not a common practices. Farmers have, without any extension involvement, come up with creative ways of using flood water whenever it is available

However there is need for awareness raising and capacity building on how to deliberately divert flood water for crop and livestock usage. The severe droughts and dry spells experienced this year provide an opportunity for scaling spate irrigation practices such as flood diversion, road run off harvesting, flood spreading weirs and bunds form hillsides. Research is also being proposed to understand the evolution of some of the major rivers from perennial to ephemeral and some of the factors contribution and how that is influencing changes in cropping patterns in lowlands.



Road run off flowing soon after Rain storms



Same place above 2hrs after the rains

There has also been the development of Wetlands in lowlands which farmers use for crop production. Wetlands provide a whole range of ecosystems services while at the same time acting as reservoirs for floodwater from uplands. The use of wetlands for crop production, livestock grazing is widespread throughout the country. Studies are being proposed to fully understand the cropping systems upland and how that has led to changes in stream flow and changes in cropping patterns in wetlands downstream.

A recent visit to one of the drought prone areas of Central Malawi, Mayani, in Dedza District discovered a traditional practice which farmers are using to recharge ground water by diverting run off from a hillside catchment. Several check-dams and diversion bunds have been constructed that collect run off from the roof tops of several staff houses as well as the hill side. The water is channeled into an infiltration pit very close to the Borehole. The communities testify that as a result of this, the Borehole has never silted up. Since the area is surrounded by hills, the potential for diverting road run of is quite huge in the area.



Diverting run off to recharge groundwater



Runoff scouring roadsides while the Maize is wilting

Conclusion and Way Forward

While there has been emphasis on better crop management to increase yields, recent climatic changes call for a pragmatic approach to boost production. More attention is required to adapt irrigation to both climatic variability and climate change through optimizing water use.



The author admiring a Maize crop grown on Planting Pits

The adoption of Flood Based Farming Systems offer a viable option for utilizing flash floods for crop production. However for this to happen there is need for government support, capacity building and the provision of extension services to farmers on the practice. Traditional practices exist in Malawi for flood recession farming and utilization of wetlands. It is important to support

farmers' innovation where it occurs and to understand the constraints within which farmers work.

References

Malunga, J.F.C., 2009. Wetland farming and small-scale Informal Irrigation in Malawi: The case of the Shire Valley. Cranfield University.

Harrison E, 2010 Small scale Irrigation in Malawi; Challenges and Opportunities. Available on http://www.sussex.ac.uk/global/research/researchprojects/small_scale_irrigation