

Risk Mitigation through Holistic Sustainable Horticultural Production Practices: The Case of Poultry in Northern Mozambique

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THE PROBLEM

With a rapidly growing population and arable land declining, sustainable agriculture is pivotal to food security in Sub-Saharan Africa. Food security issues for subsistence farmers in most low-income countries are a product of endogenous (crop yields) and exogenous (currency fluctuations) factors. In Mozambique the value of the Metical has decreased by 37% since January 2016. While this makes domestic produced products more attractive in a relative sense it negatively effects those agricultural industries which rely on imported inputs such as feed and fertilizer. Large scale poultry production in Mozambique is still in its infancy, but is necessary to providing inexpensive protein to one of the most protein deficient parts of the world. The decline of the metical has curtailed historically cheaper poultry imports from South Africa and Brazil helping local poultry producers, but has come at a steep price as the majority of feed (soya and maize) has to be imported.

THE PROJECT

In response to this exogenous currency crisis research was conducted in Nampula, Mozambique on the most efficient method for implementing crop diversification to reduce the risk that accompanies the devaluation of the local currency to combat food insecurity (Figure 1). The objectives included: 1) educate poultry producers on growing maize and 2) perform on-site evaluations along with crop profitability analysis for various horticulture crops (Figure 2).

THE OUTCOME

Results indicated that if small scale poultry producers could raise maize on small plots they could earn additional income and stabilize domestic prices of maize, which increased food security and producer livelihoods (Figure 3 and Figure 4).

Figure 1. The continent of Africa (left) and the country of Mozambique (right). The star on the map of Mozambique is where research was conducted.

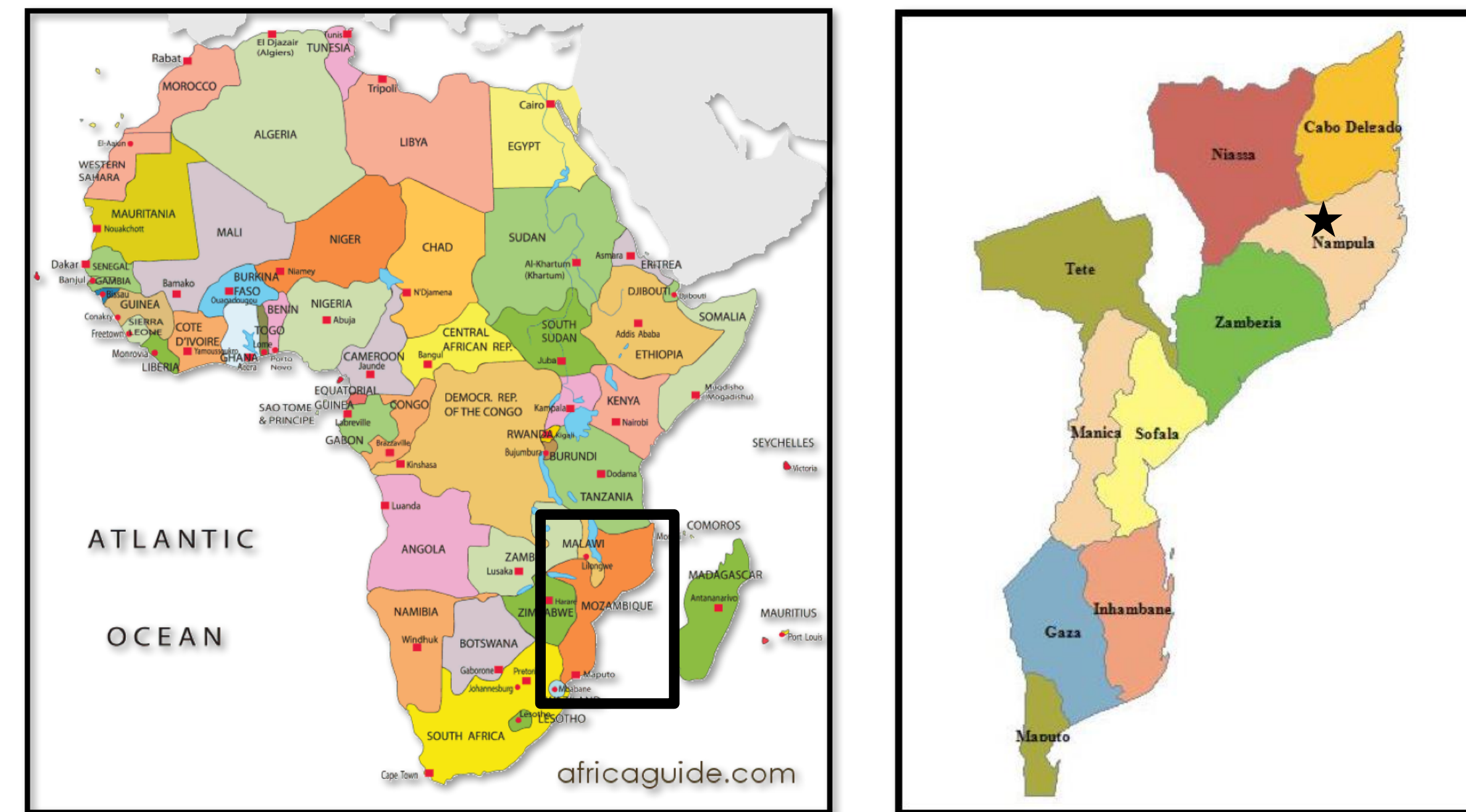


Figure 3. A poultry producer feeding chickens a maize mixture through the use of hanging feeders, Nampula, Mozambique, 2016.



Figure 5. Bulls-eye model for sustainability, adapted from (Mann, 2011).

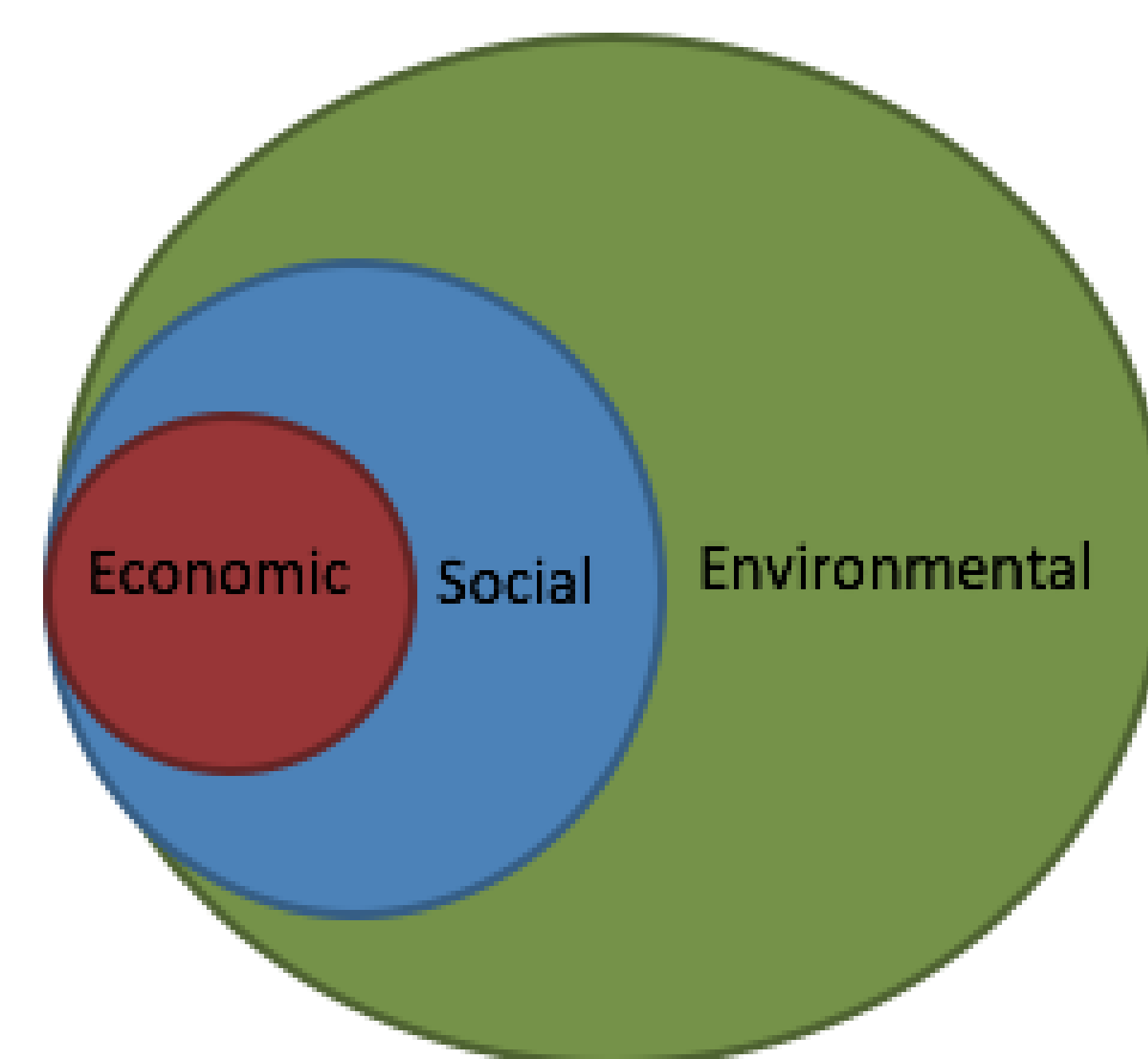
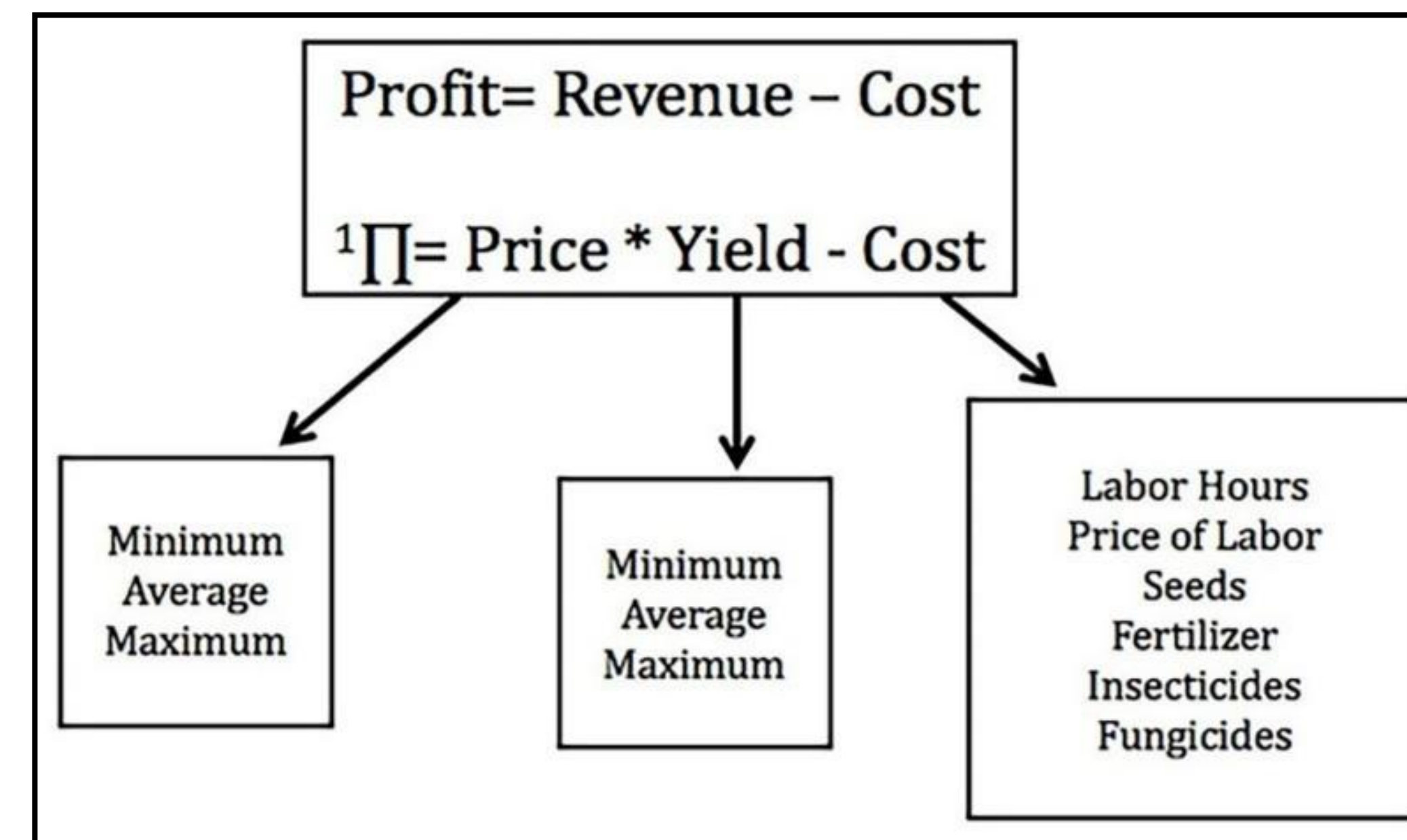


Figure 2. Structural framework for profitability (Lawton Nalley pers. comm. 2016).

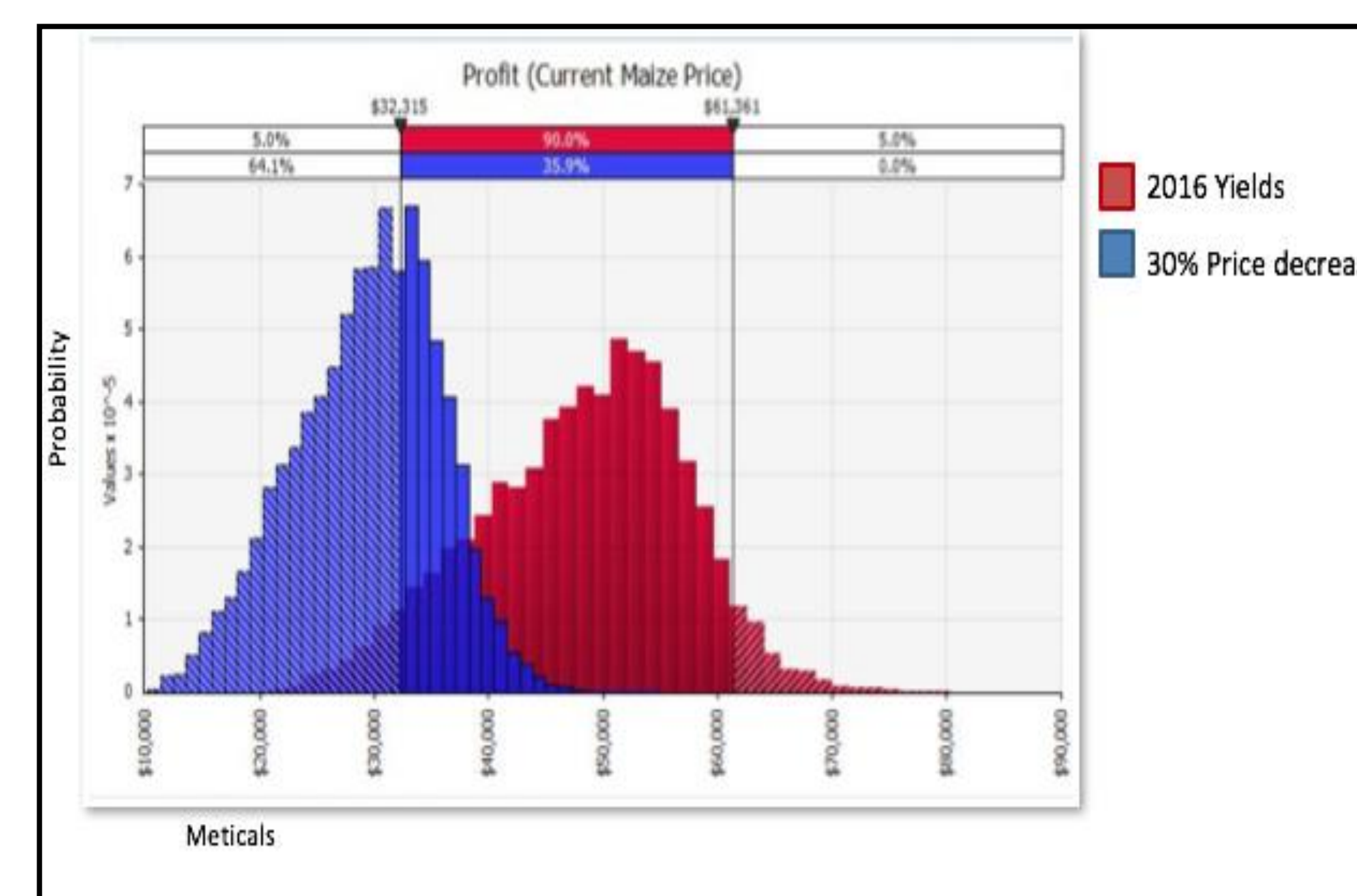


Π = Profit

Figure 4. A maize plot used for crop profitability analysis, Nampula, Mozambique, 2016.



Figure 6. 2016 maize yields and maize profitability with 30% price decrease, Nampula, Mozambique.



SUSTAINABILITY

This area of research further enabled poultry growers in Mozambique to increase farm productivity through horticulture crop diversification, increased job availability and increased human and social development (Figure 5). The results of this study are important on several levels. First, it appears that maize can be profitable to small scale producers in Northern Mozambique 100% of the time given the information from this research. Second, via the @Risk® simulation it also appears that maize production can provide a stable source of income (high percentage of breaking even) with a 30% price decrease when all other factors remained the same (Figure 6). Third, maize production by small scale producers can benefit the infant poultry industry in Mozambique which has provided much needed inexpensive protein, in the form of eggs and meat, via reduced maize prices which are not subject to foreign currency fluctuations.

My ability to complete a research project that incorporated my horticulture degree and sustainability minor provided real world application of concepts that were learned in the classroom. This research allowed me to live and work in one of the poorest countries on the planet and make a positive impact through sustainability initiatives that positively impacted the lives of locals through improved food production. My capstone experience has further fueled my passion for sustainability and helped me realize the link between sustainability and horticulture. In addition, I have learned how I can use these concepts in my future career to make improvements that benefit the economic, social and environmental sectors.

Literature Cited

Mann, S. 2011. Sustainable lens: A visual guide.