The Water 4 Mercy School of Agricultural (WAMSA) with Don Bosco Tech Africa

Training, Demonstration and Research Site at Don Bosco Technical Institute, Dodoma, Tanzania (WATDR)

White Paper

February 2020

Executive Summary

The following white paper discusses the establishment of the Water 4 Mercy School of Agriculture (WAMSA) together with the Don Bosco Technical Institute in Dodoma, Tanzania. The main objectives of WAMSA are knowledge development, climate change resilience, nutrition-sensitive agriculture, income generation, teacher training and youth employment.

Introduction

Designed to transfer knowledge, WAMSA utilizes hands-on curriculum that incorporates the collaborative water and agricultural expertise of Israeli NGO's Innovation:Africa and CultivAid at the Don Bosco Technical Institute in Dodoma, Tanzania. All aspects of implementation and future programing will value nutritional security as a top priority, developing strong linkages between agriculture, health and economic growth.

The first component is the physical and operational establishment of the Water 4 Mercy School of Agriculture. The Water 4 Mercy Training, Demonstration, and Research (WATDR) site will be the physical location where students will apply their knowledge. The operation of WAMSA will include an 8-month student training program and technical support to selected projects (i.e. Innovation:Africa's drip irrigation projects, Mama Mercy and Huzi Mango). The program will place Israeli agronomists in Dodoma to provide capacity building and project development with Don Bosco. Following 3-5 years of implementation, Israeli experts will be phased out and all aspects of operation and training will be transferred to Don Bosco's newly developed experts.

The second component of WAMSA is the establishment of income generating activities that aim for self-sustainability, job creation and explore employment opportunities for graduates of WAMSA. A feasibility study will assess each site to recommend the most relevant type of agricultural activity for the area. Income generation and employment opportunities are essential for economic development and the widespread diffusion of 'best practice' knowledge and technologies.

The third component of WAMSA is the establishment of a manufacturing and production department for agricultural equipment and tools at Don Bosco. This may include structures of protected agriculture, farming machinery or various inputs required for modern agricultural activities.

WATDR Overview

WATDR will include a 6-acre (~2 hectare) horticulture site and a 0.81-acre (~0.5 hectare) livestock site, which will serve as a model for future scalability to other Don Bosco campuses throughout Africa.

Physical Layout

The physical layout of the horticulture and livestock plots are described in the following tables:

Table 1 Land area of the horticulture plots

Component	Total Area (acre)
Open field drip irrigation	1.2
Open field sprinklers irrigation	1.2
Orchard, with drip irrigation	1.2
Protected agriculture structures	1.2
Roads and operational area	1.2
Total	**6**

Table 2 Land area of the poultry

Component	Total Area (acre)
Poultry house	0.15
Cooling room	0.01
Roads and operational area	0.06
Total	**0.81**

Knowledge Transfer

The knowledge transfer and capacity building for the WATDR site will be implemented through on-site Israeli agronomists, CultivAid's technical team and Don Bosco staff.

WAMSA will initiate an 8-month short term course in horticulture (vegetables, fruit trees, greenhouse production and seedling production) and livestock (poultry for meat and egg production). Following the successful implementation of the 8-month program, a three-year horticulture and livestock program will be phased in to provide more comprehensive training and education. Following the three-year program, graduates will be provided a plot of land at one of the Don Bosco-owned sites in Dodoma. At these sites, trained graduates will have the opportunity to grow crops and manage livestock based on what they have learned. These sites will provide students the opportunity to implement their newly developed skills while still getting technical support and extension services through Don Bosco. In return, graduates will share the returns with the institution. WAMSA will promote new employment opportunities following students' successful graduation to ensure placement of all graduates by promoting private sector development.

There will also be opportunities for the community to participate in Regional Training and Open Days, hands-on sessions that will allow the community to engage with Israeli agronomy experts. Regional Training sessions will charge a fee to support the operations of WAMSA. Open Days will be seasonal activities to demonstrate the agricultural technologies at WAMSA and build the reputation of Don Bosco Institute as a leader in agricultural training programs. Open Days will also introduce the community to the quality products being grown at WATDR, and thereby improve the market demand of these products.

WAMSA will also implement a Teacher Training program that will cover Vocational, Technical and Skills-based Education in the newly established teacher college. The program will provide teachers the ability to diffuse the knowledge to other Don Bosco centers, to high schools and colleges in Tanzania, East Africa and the world. The teachers will support the expansion of the program in the country and outside the country.

The agricultural experts on site will support the development of an agricultural equipment and mechanization program that can add value to the local agricultural sector. Examples of the program's components may include Agricultural Mechanization, Equipment Development for Greenhouses, Manufacturing, Assembly and Production of Agricultural Tools.

Conceptual Components

WATDR will be the "physical classroom" for the practical application of the curriculum covered at WAMSA. Within the horticulture portion of the curriculum, WATDR provides the opportunity to explore and transfer the following conceptual components:

Eating the Rainbow

This concept promotes dietary diversity and thus greater intake of nutrients and healthy foods that are required to combat malnutrition and childhood stunting. Through the cultivation of fruit orchards and vegetable crops, students will have the opportunity to grow food to encourage a nutrient-diverse diet, impacting the health of their communities into the future.

Protected Agriculture

The development of protected agriculture technology for horticulture and high-value crops is critical for sustainable crop intensification. This technology enables farmers to grow vegetables year-round and produce high yields when specific crops are not available in the market or when the price is highest.

Seedling Nursery

Regardless of the technology implemented, high yield and crop quality are dependent on high-quality seeds which will be grown at the nursery, used for the farm and sold for profit.

Free-Run Housing System

This production method will allow the hens to roam freely within an enclosed barn and provides a variety of enrichments along the barn floor, including nesting boxes and perches. Free-Run Housing Systems value animal welfare and provide more space per animal.

Budget and Cost-Benefit Analysis (CBA) of WATDR

Summary of Estimated Costs of WATDR

Description	Cost (USD $)
Horticulture project design	25,850
Horticulture capital cost	140,156
Field staff program	230,860
Poultry project design	9,283
Poultry capital cost	168,196
Overhead	86,152
Total	**$660,497**

Summary of CBA of WATDR

Description	Total inputs (USD $)	Total revenue (USD $)	Total profit (USD$)
Year 1	147,225	247,048	99,823
Year 2	147,225	247,048	99,823
Year 3	147,225	247,048	99,823
Year 4	147,225	252,166	104,941
Year 5	147,225	256,645	109,420
5-year total			**$513,830**