Background

Nearly five years ago, the Ministry of Agriculture and Animal Resources, the Dutch Ministry of Foreign Affairs, Kabuye Sugar Works Limited (KSWL), TechForce Innovations, Karisimbi Business Partners, Royal HaskoningDHV, Milan Innovincy, Wageningen University: Environmental Sciences Group and Wageningen University: Centre for Development Innovation officially established a Dutch-Rwandan Public Private Partnership project officially known as “Sugar: Make it Work” or “Isukari: Imvugo Tuyigire Ingiro” (IITI).

The project was born as a result of various challenges including increasing demand for sugar which leads to higher imports, shortage of suitable land available for sugarcane agriculture, severe flooding of the Nyabarongo River and water stagnation challenges hampering growing sugarcane, a need for better communication and clear understanding among stakeholders in the sugar value chain, and finally low crops monitoring and prediction capabilities resulting in lower sugarcane yields.

The IITI project’s main goal was to develop a more competitive, sustainable, and inclusive sugar value chain in Rwanda to address the above challenges. The initial objective of the IITI project was to increase the sugar production in Rwanda by reclaiming an area of approximately 1500 Ha in the Nyabarongo marshlands, optimizing the sugarcane yields and sugar recovery rate, generating employment opportunities to an extent of 3000 workmen directly and indirectly, improving the standard of living of the farming community along the Nyabarongo River and thus aligning with the goals of the Economic Development and Poverty Alleviation Strategy of the Government of Rwanda.

On the 15th of March 2018, the project partners held a meeting with outgrowers in Ntarama Sector, Bugesera District to officially conclude the activities of the project. Partners also had separate discussions during the same week to discuss the final evaluation results of project and the sustainability of the project after it ends. The five-year €8 Million project is expected to be officially concluded by end of June 2018 with final reporting activities undergoing. The IITI project has found immense success through the hard work of the project partners and outgrowers and this article discusses the major results of the IITI project and plans for sustainability.
Areas of Intervention

The principle goal of the IITI project was founded upon the belief that a competitive, sustainable, and inclusive value chain would be ideal, and could be achieved through water management, training and value chain improvement, precision agriculture, and institutional embedding. The IITI project focuses therefore on four key intervention strategies:

i. Water management: Designing and installing improved water management infrastructure on approximately 1,500 Ha of marshland to alleviate water stagnation risks and drain flood plains more efficiently, with minimal impact on the environment and ongoing maintenance managed easily by local farmers and KSWL: a design philosophy known as “Building with Nature” and “Living with Water”

ii. Value chain improvements: Organization of small-holder farmers and increasing their knowledge of best farming practices through tailored training services and value chain engagement programs

iii. Precision agriculture: Incorporating remote sensing techniques for efficient crop monitoring through “under the clouds” image analysis and crop growth modeling that provides decision support to Kabuye Sugar Works by identifying crop stress, optimizing harvest timing, collection and transport logistics, all contributing to higher sugarcane yields.

iv. Institutional embedding: Aligning Government of Rwanda policies and pertinent public agencies with the project interventions and developments to foster integration and collaboration amongst key public-Sector stakeholders.

WATER MANAGEMENT

The IITI project constructed infrastructure including Primary drainage canals, culvert bridges, river outlet structures with flap gates, and riverbanks fortification on selected sites along the Nyabarongo River in Bugesera, Kamonyi, Kicukiro and Nyarugenge districts to alleviate water stagnation that was hampering sugarcane growth. Construction activities were soon followed by the clearing of papyrus and cultivation of sugarcane on newly reclaimed land.

Key achievements:

- 2,008 Ha of land reclaimed surpassing the initial target of 1,506 Ha
- 100% of reclaimed land has been cultivated
- Infrastructure constructed includes drainage canals, culvert bridges, outlet structure with flap gates and riverbanks fortifications
- A 13.1% increase in the average yield per Ha. Current yield average yield is 68MT/Ha at the crop age of 16 months.
- A sharp increase in total sugarcane output and sugar production overall, with 136,000MT of cane and 12,000MT of sugar expected to be produced respectively by end of April 2018
- Trained on agricultural practices and enhancing relationships between outgrowers and KSWL through facilitating regular meetings of outgrowers and KSW which have resulted in increased collaboration and sugar production.

Value chain improvement:

The major activities involved organizing outgrowers into groups, training them on best farming practices and enhancing relationships between outgrowers and KSWL. Outgrowers were organized in sugarcane cooperatives (SUFACOs) and water management organizations (WAMOs) and received trainings on leadership, entrepreneurship, financial management, and training on best farming practices for them to increase productivity and thereby increase their incomes. Additionally the project also enhanced relationships between outgrowers and KSWL through facilitating regular meetings of outgrowers and KSW which have resulted in increased collaboration and sugar production.

Key achievements:

- Nine cooperatives formed and registered in all nine sectors of the project
- Seven water management organization formed with six of them fully registered
- Increase of KSWL estate laborers from 2,234 in 2013 to 2,925 in 2018
- Number of outgrowers in the project grew from 1,624 in 2013 to 3,427 outgrowers organized and trained in 2018

Plans for sustainability:

- Regular operations and maintenance works by outgrowers through water management organizations and KSWL
- Contribution of outgrowers from sugarcane revenues to water management organizations account that is used to maintain water management structures

Value Chain Improvement

1. Outlet structure in compartment 6, Mageragere Sector in Nyarugenge District
2. Culvert bridge constructed in Runda Sector, Kamonyi District
3. MINAGRI State Minister receiving explanations on his visit to compartment 6 in Mageragere Sector, Nyarugenge District
4. Outgrowers field training on best sugarcane farming practice
5. Mageragere Sector Outgrowers acquired a truck for cane transportation through SUFACO savings schemes
6. Discussions with public stakeholders at 2nd Steering Committee Meeting
7. Aerial survey with drone for crop growth monitoring
Improved relations between KSWL and farmers; KSWL has taken initiative to discuss with farmers on a quarterly basis on various topics. An important topic includes pricing trends and payment structure based on the local and international sugar market before announcing the cane price for the season.

Mageragere Sector outgrowers’ Cooperative acquired a truck worth 40 million RWF for cane transportation through SUFACOs savings schemes and a bank loan and other sectors are expected to follow suit.

**Plans for sustainability:**
- Organizational structures are in place to improve agricultural practices, maintain water management infrastructures and business development interests of outgrowers
- Farmers are paying water management and cooperative fees and becoming business oriented in searching for their own solutions to issues that arise
- Enhanced KSWL and outgrowers relationships and continued regular discussions on pricing trends and payment structure based on the local and international sugar market

**PRECISION AGRICULTURE**

The main purpose of the precision agriculture component was to develop a yield prediction model that would, through remote sensing technology, provide KSWL with a decision support tool in crop management, yield forecast and harvest scheduling along with training on the long-term operation and maintenance of the technology. This remote sensing technology uses enhanced, cost effective and proven airborne sensor technology attached to small low flying drones that are flown over sugarcane plots to take pictures which are analyzed, interpreted and used to support crop monitoring decisions by KSWL. Spectral measurements have been taken and flight campaigns executed over the life of the project to monitor crop maturity and health, to provide yield prediction and harvesting scheduling for KSWL.

**Key achievements:**

- Customized remote sensing methodology was developed for acquiring and analyzing time series of spectral data and flight campaigns were conducted over an area of 300 Ha.
- A yield prediction model was developed which provides crop management, yield prediction and harvest scheduling services.

**Plans for sustainability:**

- Project partners are set to have discussions on elaboration of the technology that could lead to a scale-up in other crops or regions to contribute to increased economic development.

**INSTITUTIONAL EMBEDDING**

The IITI project sought to increase integration of local government and public institutions in the Project and value chain actors at large, to ensure that future policies were aligned with proposed interventions. A steering committee was established to hold regular meetings that would bring all project stakeholders together to align government policies with project interventions, facilitate better coordination and help solve problems hindering the project progress. The steering committee was led by the Ministry of Agriculture and Animal Resources. Meetings have been attended by project partners, outgrowers, The Ministry of Trade and Industry and EAC Affairs, The Ministry of Infrastructure, The Rwanda Agriculture Board, Rwanda Cooperative Agency, Rwanda Governance Board, Rwanda Water and Forestry Management Authority, Rwanda Land Management and Use Authority, Capacity Development & Employment department now in RDB, and Officials from the Districts of Bugesera, Kamonyi, Kicukiro and Nyarugenge.

**Key achievements:**

- Five steering committee meetings were held.
- Two formal operations and maintenance workshops, multiple informal workshops and site visits were held and attended by project stakeholders.
- Provisional land allocation of 1,104 Ha (55% of total reclaimed land belonging to outgrowers) of reclaimed land done in collaboration with outgrowers, local government authorities and KSWL.
- Procedure initiated for Ntarama Sector Bugesera District cooperative to acquire a land lease from the Ministry of Agriculture and Animal Resources.

**For more information**

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