Australian Government
Australian Centre for International Agricultural Research

Final report

project	**School Food Revolution: Evaluating opportunities for further research**
project number	GP/2017/007
date published	1/06/2019
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approved by	NA
final report number	FR2019-62
ISBN	978-1-925747-38-6
published by	ACIAR GPO Box 1571 Canberra ACT 2601 Australia

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1 Acknowledgments

We continue being indebted to the women and men smallholder farmers from the Sustainable Income Generating Investment Group (SINGI), and numerous other country partners, who, through their hard work, are gradually gaining recognition for their pioneering activities as well as contributing to improving the enabling environment for the innovative approach tested with this SRA in the communities in which they operate.

The fact that in 2017 SINGI was shortlisted among the top ten initiatives by Solutions Search for the Farming for Biodiversity competition - a competition created by Rare to identify and highlight innovative and practical examples to address conservation and development challenges - is a testament to SINGI's dedication and commitment.

SINGI have been carrying out work in Busia County to assist the project in implementing and testing a sustainable food procurement model targeting indigenous vegetables, which links local farmer associations to schools and school feeding.

Our gratitude therefore goes to William Buluma and the farmer organizations he represents, as well as to Aurillia Manjella and Victor Wasike and his staff from the Kenya Agricultural and Livestock Research Organization who have ensured we now have a workable model for sustainable food procurement to be tested in other geographical contexts as part of SRA GP/2018/101.

We cannot thank Dr. Mark Obonyo, Principal of St. Mary's Mundika Secondary School, enough for being a visionary key player of the project since its inception. Dr. Obonyo embraced the project with enthusiasm and provided deep insights into ways of improving the food procurement model and outscaling to neighbouring schools and regions. Further, our appreciation is extended the staff of St. Mary's, including the procurement officers, caterers, school cooks and teachers who continue to hold the project torch and are raising considerable interest among neighbouring and distant schools alike.

We are also greatly indebted to all the key players and representatives from the Busia County Ministries of Agriculture, Health, Education and Environment who took part in the project meetings, launches and ensured this was a multi-stakeholder effort with significant political buy-in. Not to mention the three extension officers, Scholastic Nabade, Florence and Odeyo who followed the project closely and offered their expertise to our staff in the field and to SINGI farmers.

Last but not least, we take this opportunity to gratefully acknowledge the insights, important contributions and dedication provided by participants to the Busia Stakeholder workshop, held in Kisumu, Kenya from 3-7 July 2017. Many of these contributors have remained engaged in the new SRA GP/2018/101, either as active players or as observers, but always ready to offer advice on the topic of linking smallholder farmers to institutional markets. Thanks to their efforts, the Busia approach is set to be more rigorously tested in new locations in Kenya, as well as in Ethiopia, Uganda and Tanzania.

Naturally, the pilot could have not been possible without assistance from ACIAR. Our gratitude goes particularly to Annie Sanderson for her guidance and supervision.

2 Executive summary

Successes and evidence from around the world demonstrate the potential for multiple benefits – enhanced nutrition, improved school performance and achievement, employment and national economic growth - of locally sourced school meals. The purchasing of food for schools from local farmers can support farming households and livelihoods, and promote sustainable local markets for diverse, nutritious foods. Well-planned and joined-up interventions have the potential to realize much synergy and multiple wins at many levels. While many local and national governments are today implementing components of such an approach, few are integrating the different components to create these multiple benefits. This includes the better integration of more underutilized, nutrient-rich food biodiversity.

Despite the many barriers and challenges to better integration of food biodiversity for school meals, the opportunities to explore this issue are favourable. The IPES-Food (2016) *From Uniformity to Diversity* report highlights sustainable and healthy sourcing of underutilized food biodiversity as an opportunity for both home-grown school feeding programmes and public procurement programmes. The 2016 Global Panel Foresight Report, *Food Systems and Diets: Facing the Challenges of the 21st Century*, in highlighting its 10 priority actions to effect diet change draws attention to the need to *institutionalize high-quality diets through public sector purchasing power* including food provided in schools, which should be of the highest dietary benefit. The Global Panel has also produced a policy brief calling for greater policy emphasis on the multiple-win agenda that couples meals in schools with benefits to agriculture, education and nutrition and summarises knowledge, evidence and successes. The 2014 Second International Conference on Nutrition (ICN2) stresses that *healthy diets should be fostered in preschools and schools* in its Rome Declaration, supported by a number of relevant recommendations on diversification of food systems and diets in school settings. In fact, recommendation 23 calls for the *improvement of diets through better access to food, which conforms to the beliefs, culture, traditions, dietary habits and preferences of individuals*. Finally, the 2016 Global Nutrition Report highlights that *schools also provide a huge opportunity to reset norms about healthful diets and good nutrition practices*.

It was identification of this opportunity, and shortcoming, that initial efforts, supported by ACIAR, commenced in 2014 in Busia County, Western Kenya, to test how schools might offer stable markets for smallholder farmers practicing sustainable agriculture and increase demand for local food biodiversity. The initial SRA (HORT/2014/100) successfully developed a viable and replicable pilot to connect production and consumption of local edible biodiversity and established an enabling environment in the county for a workable food procurement model that puts local food biodiversity at its core and which can potentially be rolled out in other locations. This current (SRA GP/2017/007) was developed in order to help identify ongoing barriers and challenges and research questions pertinent to the rolling out of this pilot model to other locations as the types of capacity and partners required to support this.

With this in mind SRA GP/2017/007 set itself the goal to build upon the existing work by reviewing the lessons learned from the initial pilot study, defining key knowledge gaps and the likely constraints and opportunities relating to extending this procurement model to diverse situations - elsewhere in Kenya and in other East African countries - and building the partnerships to support this wider research. These key results across the three objectives are described in detail, as are the preliminary scientific, capacity, social, economic and environmental impacts. Efforts to highlight these findings and impacts are also described.

3 Background

This SRA builds upon a pilot activity that was undertaken in Busia County, Kenya, between 2015 and 2017 within the framework of three projects: the ACIAR-funded *Linking Smallholders to Markets* (HORT/2014/100); the Global Environment Facility (GEF) funded Biodiversity for Food and Nutrition (BFN) project executed by Bioversity International (www.b4fn.org); and a small grant from the McArthur Foundation . These projects identified an opportunity to promote a sustainable food procurement approach linking schools to local farmer organizations who were engaged in the small-scale production of nutritious neglected and underutilised species using sustainable agricultural practices.

Under the umbrella of the these projects, the approach successfully connected production and consumption of local edible biodiversity, created employment opportunities for smallholder farmers and assured safe vegetable supply to local schools while establishing an enabling environment in the county (Borelli et al. 2018).

These projects provided preliminary practical experiences in defining and overcoming the barriers and constraints associated with linking groups of producers of indigenous leafy vegetables and other underutilized, nutrient-dense foods, via short supply chains to school feeding programs and procurement programs of other institutions that value good nutrition.

However, limited evidence existed to suggest that these links could be sustained in the long-term, and whether the approach could work in different geographical contexts.

GP/2017/007 therefore set itself the goal to build upon the existing work by reviewing the lessons learned from the pilot study, defining key knowledge gaps and the likely constraints and opportunities relating to extending this procurement model to diverse situations - elsewhere in Kenya and in other East African countries - and building the partnerships to support this wider research.

4 Objectives

The **Objectives** of this Small Research Activity were:

1. To define the remaining knowledge gaps and opportunities relating to optimising the existing local procurement and school feeding model.

2. To identify the likely constraints, opportunities and researchable issues associated with adapting the model to new situations.

3. To establish the broader partnerships needed to address the research gaps and development issues identified.

Activities included:

- Review of existing reports and documents and on-going local surveys (based on structured and open-ended interviews) and stakeholder consultations to determine remaining knowledge gaps and opportunities.
- Preparation of preliminary technical background documents and power point presentations on the experience to date with the implementation of the Busia food procurement and school feeding model identifying remaining knowledge gaps for stakeholder consultation workshop participants
- Documentation of success stories and testimonials from schools, farmer groups, and other actors involved in the Busia food procurement and school feeding model to date which identify the benefits and costs to men, women, boys and girls and other marginal groups
- Finalize workshop logistics including workshop programme, agenda and key background documents, and distribute ahead of stakeholder consultation workshop, Identify key strategic participants, define their workshop roles and inputs including preparation of relevant background materials and workshop presentations
- Organize workshop field trip to Busia for participants to meet and interact with all actors involved in the Busia food procurement and school feeding model pilot project
- Implement stakeholder consultation workshop and field trip aimed at developing the 'business case' for further research to develop the 'school food revolution' model.
- Research gaps and development issues reviewed and compared with expertise available within existing team and among potential partners operating in the region
- Research partnership defined and roles and responsibilities in finalizing 'business case' described with timelines and communication strategy
- Promotion and awareness-raising of the initiative by research partnership and fund-raising

The main **Outputs** linked to these objectives were:

Output 1: Documentation and report on key findings and outputs, as well as preliminary identified knowledge gaps, opportunities and production and supply side barriers and constraints of the Busia food procurement and school feeding model prepared for workshop participants and distributed prior to the workshop; other relevant awareness raising and communications materials prepared for use during stakeholder workshop

Output 2: Stakeholder consultation workshop report with key findings prepared identifying key barriers and constraints; opportunities; capacity needs; target locations/countries and researchable issues; draft project outline prepared; strategic research partnership strengths and contributions identified;

Output 3: 'Business case' and budget developed and submitted to ACIAR and other donors

5 Methodology

A combination of methodologies was used across the three objectives.

For **Objective 1**, reports and other outputs stemming from SRA HORT/2014/100 were consolidated and summarised in preparation for the stakeholder consultation workshop.

Findings and lessons learned drawn from the original scoping study and the resultant reports below were analysed and used to inform discussions held during the stakeholder consultation workshop:

- *Report on identified production and supply side constraints for the promotion of local nutritious crops in Busia County. Results from a Consultative workshop 23-24 September 2015*
- *Report on impact of linking farmers to markets: Achievements, Opportunities and Challenges in Busia County*
- *Study report on the feasibility of negotiating a guaranteed price for producers in institutional markets and methods for developing a sustainable supply chain model*

These are provided in the Appendices section - Outputs for Objective 1 - as part of this report.

Under **Objective 2**, key partners from Kenya, Tanzania and Uganda and other strategic international partners (e.g. World Food Programme, World Vegetable Centre, World Agroforestry Centre and Partnership for Child Development) were invited to a three-day stakeholder consultation workshop (3-7 July 2018). The workshop provided space and opportunity for the actors involved in developing the Busia approach to present their finding and perspectives. Assessments of were made by:

- The national executing agency implementing the project in Busia, the Kenya Agricultural and Livestock Research Organization (KALRO)
- The Busia County administration, particularly the Agriculture, Health and Education sectors
- The school that first embraced the model, St Mary's Secondary School, Mundika, Busia
- Representatives of the Sustainable Income Generating Investment Group (SINGI)

Participants external to the project were encouraged to think critically on how the value of their work could add to a larger project proposal that would aim to scale up the Busia approach in different geographic locations. The *Fishbowl technique* knowledge sharing method was used to explore issues around what might have been done differently in rolling out the approach and current options for scaling out the Busia approach to other neighbouring schools and counties. Group exercises were used to collectively explore the three main research questions to be addressed in a larger ACIAR proposal that aims to define the 'business case' for rolling out and evaluating the food procurement and school feeding approach piloted in Busia to a range of new situations in Kenya and other countries. Gaps, barriers and opportunities were explored along the supply chain, using the Home-grown School Feeding (HGSF) framework (Gelli, 2010). The main research questions explored (see Fig. 1) were:

RQ1: Key barriers and constraints within the Busia model

RQ2: Main knowledge gaps and researchable issues relating to optimising the existing local procurement and school feeding approach

RQ3: Key opportunities associated with adapting the model to new situations

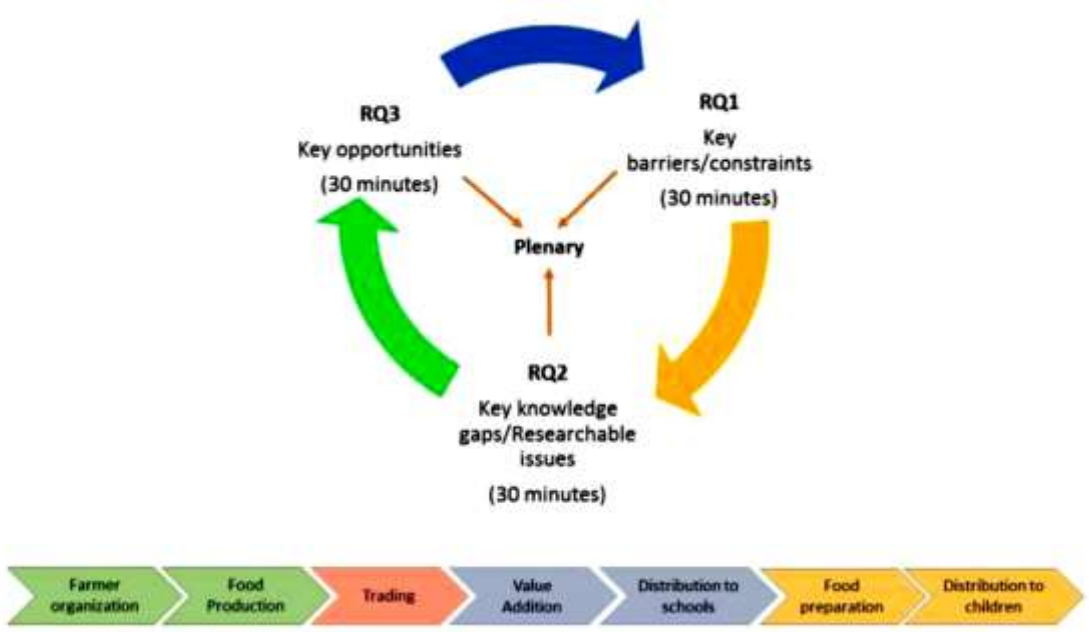

Fig 1. Methodology used to explore key barriers, opportunities and gaps in the Busia approach using the Home-grown School Feeding (HGSF) supply chain framework as a reference.

Detailed methodologies used in the workshop are available in the workshop report provided in Appendix 2.1 – in Outputs for Objective 2.

Results from the workshop informed the drafting of a 'business case", essentially a full research proposal, listed as an output under **Objective 3**. At the beginning of 2018, a draft proposal and associated budget were submitted to ACIAR representing the culmination of consultations.

The new SRA and budget for "Analysing Schools as Platforms to Improve Diets Livelihoods and the Environment in four countries in East Africa" (GP/2018/101) is available as Appendix 3.1 under in Outputs for Objective 3, as part of this report.

The new SRA recognizes the potential to upscale the Busia approach but appreciates the limited evidence base offered by the pilot project to date.

Due to its very nature, the pilot offered only preliminary evidence of the economic, social, nutritional and environmental impacts of the Busia home-grown school feeding (HGSF) approach on its beneficiaries. These effects are likely to be heterogeneous and context-specific (Gelli et al., 2016) and require a deeper and more rigorous understanding of the agroecological conditions and market linkage settings in different countries if HGSF approaches are to yield positive agricultural development and nutrition outcomes as well as the economic and social impacts of providing a reliable market for smallholder farmers. Furthermore, efforts to encourage the incorporation of underutilized, nutrient-rich crop diversity in HGSF approaches has been very limited to date (Hunter et al. 2016; UNSCN 2017).

6 Achievements against activities and outputs/milestones

No	Activity	Outputs/ milestones	Completion date	Comments
Objective 1 - To define the remaining knowledge gaps and opportunities relating to optimising the existing local procurement and school feeding model				
1.1	Review of existing reports and documents and ongoing local surveys	Review completed	June 2017	**Completed**
1.2	Preparation of preliminary technical background documents	Technical background documents prepared	June 2017	**Completed**
1.3	Documentation of success stories and testimonials	Success stories and testimonials recorded	Ongoing	**Completed**
Objective 2: To identify the likely constraints, opportunities and researchable issues associated with adapting the model to new situations.				
2.1	Identify key strategic participants/partners for the workshop	Key partners identified	June 2017	**Completed**
2.2	Organize and implement stakeholder consultation workshop	Stakeholder consultation workshop undertaken	July 2017	**Completed:** Report prepared and strategic research partnership strengths and contributions identified
Objective 3: To establish the broader partnerships needed to address the research gaps and development issues identified.				
3.1	Raise awareness of the initiative and fund raise	Awareness-raising initiatives on-going	July 2018	**Completed**
3.2	Prepare and submit 'business case' to ACIAR	Business case submitted	February 2018	**Completed**

PC = partner country, A = Australia

7 Key results and discussion

Objective 1 *- To define the remaining knowledge gaps and opportunities relating to optimising the existing local procurement and school-feeding model.*

The scoping study carried out under SRA HORT/2014/100 provided sufficient evidence to demonstrate that farmers can be linked to schools when a number of key factors are in place. Results from the two SINGI reports stemming from HORT/2014/100 – namely,

- *Report on impact of linking farmers to markets: Achievements, Opportunities and Challenges in Busia County*
- *Study report on the feasibility of negotiating a guaranteed price for producers in institutional markets and methods for developing a sustainable supply chain model*

show that marketing constraints exist for smallholder farmers such as:

- Limited access to quality seed
- Inadequate access to irrigation technologies & innovations and technologies for value addition
- Low investment in value chains for neglected and underutilised crops
- Limited access to loans
- Delayed payment by public institutions

However, there is limited evidence to suggest that these links can be sustained in the long-term, which calls for additional research on the approach. Efforts are needed to sustain and scale up market linkages by providing a learning platform for members and building synergies in resource mobilization, production and marketing of neglected and underutilised species of nutrition importance, including African Leafy Vegetables.

Objective 2 *- To identify the likely constraints, opportunities and researchable issues associated with adapting the model to new situations.*

The stakeholder workshop organised on 3-7 July 2017 helped identify remaining knowledge gaps and opportunities linked to the Busia food procurement and school feeding approach. A schematic representation of the findings stemming from the workshop are included in Appendix 2.2.

Main lessons learned from the workshop include:

1. An enabling policy environment and political support are key for market linkages to occur and succeed. One of the points raised during the stakeholders' workshop was the issue of sustainability and better engagement with relevant Ministries to obtain support for the approach and provide training/support to farmers keen on increasing production that is currently domestic or low scale, engaging in value addition and managing their own agribusinesses. The current capacity of farmers to produce indigenous vegetables in sufficient amounts to satisfy market demands remains limited, and infrastructural, political and financial mechanisms need to be in place to support farmers to respond to increased market demand for traditional crops. Furthermore, linking farmers to institutional markets requires constant and sustained engagement with actors on both the supply and demand side of the value chain. This engagement may include capacity building activities on a suite of topics e.g. negotiation skills, group dynamics, market surveys, good agricultural practices and procurement procedures as well as training on water harvesting techniques, as water limitations remain a critical concern during the dry seasons.

2. Reliable nutritional data on the species being promoted is needed to generate consumer and market demand for these products. Although Kenya's efforts to date in providing nutritional data have been recognised at the global level, further efforts are needed to nutritionally describe a wider section of neglected and underutilised species. Food composition data are indispensable in the field of agriculture and nutrition. In nutrition, they form the basis for the establishment of nutrient adequacy of populations, nutrient requirements, nutrition promotion, food fortification and food labelling. In agriculture, they can be used to guide production of locally available nutrient dense foods, inform agricultural policies, research and programs.

3. Better communication between stakeholders and fostering ownership was another key issue. To avoid issues of mistrust, more time should be set aside to raise awareness of the approach to school staff, school committees and the community. Suspicions about personal gains may arise when there is no common understanding about a project or community ownership.

4. Setting up a monitoring and evaluation framework to establish metrics to capture improvements in dietary diversity and health, as well as the take up of technologies by families and neighbouring communities.

5. Nurturing specialization along the African Leafy Vegetable (ALV) value chain was suggested with production increases, making it more profitable for farmers to diversify and become more specialized along the ALV value chain. Some would more likely profit in specializing in ALV seed production, transport or value addition; others in production. Cereal bank creation, and value addition was also identified as necessary for year-round preservation of nutritionally-rich crops.

6. The need to engage influencers and champions at all levels is paramount.

   At the **grassroots level**, the SINGI chairperson, William Buluma, was recognised as a champion mobilizer in the pilot project.

   In rolling out the Farmer Business School (FBS) model, trainers found considerable benefit in establishing **anchor farms**, i.e. hubs to bring surrounding farmers together, giving them access to knowledge and markets while helping them to increase ALV production and commercialization.

   In the **schools**, using teacher staff as consumers and advocates for eating ALVs as leading by example was important to convince reticent schoolkids.

   At the **political** level, the National Project Coordinator, in his role as a government official, was a champion on many levels, from national to County to grassroots. His influence helped shape and led to the endorsement of Kenya's first-ever county biodiversity policy, which recognizes the role of traditional foods in raising food security levels.

7. Making partnership, and leveraging networks, and other critical capacity, expertise and support is key

8. Mobilizing the political support e.g. the schools, the Busia county administration is also key

9. The need to leverage knowledge and information from other projects and sources e.g. BFN and other FAO support for the food composition work, the recipes, recipe cards – and the value of this knowledge for influencing all stakeholders including students.

10. Need for producing customized manuals for the production of ALVs, as well as the issue of appropriate documentation of local foodways and the need for engaging youth and the elderly in data collection of traditional knowledge. It was suggested that local folklore and songs also be considered in the documentation efforts.

11. Issues of gender should be considered when exploring food pathways at the household level, as well as the issue of providing access to funds (e.g. revolving funds or other micro-credit schemes) to promote project ownership.

12. Food fairs not only served to raise awareness and appreciation among different stakeholders (farmers, policy makers, students) of the nutritional value of biodiversity but also served to reinforce the need for species conservation by utilization.

Topics emerging in bullet points 4 and 11 revealed the need for a deeper and more rigorous understanding of the agroecological conditions and market linkage settings required for home-grown school feeding (HGSF) approaches such as the one tested in Busia to yield positive agricultural development and nutrition outcomes as well as the economic and social impacts of providing a reliable market for smallholder farmers. The topics helped shape a research agenda for SRA GP/2018/101 and the full research proposal that were submitted to ACIAR at the beginning of 2018.

Objective 3 - To establish the broader partnerships needed to address the research gaps and development issues identified.

Following the workshop, formal links were established with the World Vegetable Centre (formerly AVRDC) who has now become a main partner and co-implementer in the project GP/2018/101. WorldVeg has built extensive networks and research partnerships in Tanzania through the ACIAR-funded projects “Improving income and nutrition in eastern and southern Africa by enhancing vegetable-based farming and food systems in peri-urban corridors (VINESA) (FSC/2012/111).

Links were strengthened with the Kenya Agricultural and Livestock Research Organization (KALRO), while talks are ongoing with the Partnership for Child Development (PCD) of Imperial College London to establish an online platform that brings together knowledge and best practices surrounding HGSF approaches.

In Busia, the project is broadening its partnerships with national and international not-for-profit organizations that work in the field of agriculture and food and nutrition security via a forum/platform established under the Busia county government. The platform’s main aim is to avoid duplication of efforts, meets on a regular basis and is used to exchange knowledge and lessons learned. Through the platform, the project was able to link to the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) and obtain sorghum and finger millet seeds for the SINGI farmers.

Interest in the approach has helped gain additional support from USAID who provided a greenhouse to St. Mary’s Mundika Secondary School. The greenhouse is helping smallholder farmers linked to the school to meet the demand for ALVs during the dry season and to include capsicum, onion and tomatoes in their production. Capacity building on greenhouse production, value addition, hydroponics and pest and diseases control was also provided.

Thanks to collaboration with KALRO and in the framework of its Feed the Future programme, USAID also supplied 50 farmers in Busia with 1,000 fruit seedlings of guava, jackfruit, gooseberries, custard apple, white sapote, mango and avocado. The school has set aside 1 acre of land to set up an orchard and will soon be able to include fruit in its school menu.

Additional avenues for collaboration are being explored with the World Food Programme (WFP) and the Food and Agriculture Organization of the United Nations (FAO). The latter UN agency has demonstrated considerable interest in aligning the methodology contained in SRA GP/2018/201 to ongoing FAO research into the enabling policy environment for public food procurement that benefits smallholder farmers in Ethiopia, Kenya and Uganda as well as additional African countries. The benefit of integrating the two sets of data to build a more robust case for HGSF approaches such as the one tested in Busia is self-evident.

8 Impacts

8.1 Scientific impacts – now and in 5 years

In the reporting period, the Busia example was used to inform several global forums that aim to mainstream biodiversity into sustainable food systems using public procurement and particularly schools as a platform for improving nutrition. The Busia pilot approach was highlighted in Bioversity's flagship publication *Mainstreaming Agrobiodiversity in Sustainable Food Systems* (Bioversity, 2017) while the United Nations Standing Committee on Nutrition actively sought out the approach to include as a case study in its discussion paper on *Schools as a System to Improve Nutrition* (Hunter et al., 2017). The project was also included as a Solution in the new Agriculture & Biodiversity Portal launched during the World Climate Conference on 16 November 2017 in Bonn, Germany.

With the World Food Programme (WFP) intent on discontinuing funding to governments to support school feeding programmes, Busia could act as a sustainable alternative for government-led programmes.

However, although the pilot was successful in facilitating actual links between farmers and schools, it failed to deliver robust evidence of the impact of the approach on a number of domains and to measure these effects on women, men, children and youth. A selection of some of the agricultural, economic, social, health research questions that the pilot has helped raise are listed below.

Agriculture/biodiversity

- Does the intervention increase on-farm crop diversity (no. of species grown)?
- Does the intervention improve knowledge, attitudes and practices with regard to sustainable agriculture?
- Does market stability provide incentives to farmers to improve the quality of production?

Markets/Economic impact

- How do farmers' incomes and other livelihood aspects compare before and after diversifying their crop base for linking to institutional markets?
- How does farmer group composition (age, gender, number) affect the success of linking to institutional markets?
- How does the intervention influence financial planning at household level (and how does this affect other expenses/planning)?
- Do different training approaches affect the likelihood of farmers linking to markets in the different geographic locations?
- Are farmers who receive the intervention more likely to secure and sustain institutional market linkages?

Health/Dietary diversity

Farmer households

- Has the intervention affected knowledge, attitudes and practices regarding diet quality within farming households?
- Has the intervention affected the health and nutritional status of participating households (sentinel household members)?

Students

- Has the intervention affected knowledge, attitudes and practices regarding diet quality among students?
- Has the intervention affected the health and nutrition status of students (attendance, absenteeism, clinic admissions)?

Student Households

- Does the intervention influence household decisions regarding diet quality, and agricultural practices?

Schools

- Has including school-feeding increased education indicators (e.g. enrolment, performance)?
- Have the interventions influenced the knowledge, attitudes and practices of the school community towards diet quality and sustainable agricultural practices (taste and preferences, menus, education messages)
- How does integrating local underutilized, micronutrient-rich crops into school meals affect the cost of public procurement?
- Can the school meal planner (SMP) tool be successfully used to develop nutritious school meals incorporating local underutilized, micronutrient-rich crops, also accounting for seasonality?
- Does preparation (recipe development) and presentation affect the acceptability of school meals (e.g. taste and preferences, menus, education messages)?

Approaches

- Can locally-grown, underutilized, micronutrient-rich crops be successfully incorporated into HGSF networks in each location? If not, why not?
- Do certain approaches work better than others for developing nutrition-sensitive supply chains?
- Does greater evidence of the impacts of HGSF influence the adoption of school procurement models and does this differ across geographies?

Answers to these questions, to be investigated under GP/2018/101, will establish whether home-grown school feeding approaches such as the one developed in Busia can link increased demand for nutritious school meals to local sustainable production in different geographical locations.

8.2 Capacity impacts – now and in 5 years

Although not the focus of this SRA, support to communities continued throughout 2017 for the incorporation of nutritious neglected and underutilised species in production practices. Using school gardens as a platform for student empowerment, the project was able to reach out to several neighbouring schools to St. Mary Mundika's and promote the use of African Leafy Vegetables grown using sustainable agricultural practices.

Noteworthy is the case of Mundika Special School for the Deaf where SINGI organized training workshops for the students to establish their own school garden. The students have full control over the gardening and harvesting process, supplying the school kitchen and selling surplus over the holidays. Beyond the immediate effect of supplying healthy meals for the entire school (boosting nutrition and development), students are able to generate extra income by selling extra vegetables and report buying school supplies, clothing, and other necessities. This demonstrates to their families and others that disability does not prevent contribution to the community. For over 100 students at Mundika Special School, this was a huge boost to their confidence and a big step in breaking down social stigmas.

External support from USAID's Feed the Future Programme provided SINGI farmers working in St. Mary's with additional inputs and training to step up their production practices and broaden the supply of nutritious foods, gaining a competitive edge on other suppliers and traders. With a greenhouse in place and fruit trees planted on the school premises, farmers are able to guarantee a steady supply of fresh vegetables and fruits to the school kitchen.

Another important step towards recognizing the key role smallholder farmers play in sustainable agriculture and rural development was the endorsement of Busia's Biodiversity Conservation Policy. The policy, which is the first Biodiversity Conservation Policy ever endorsed for Kenya's 47 counties, makes specific provisions for building the capacity of smallholder to conserve and use biodiversity to enhance nutrition and health and to profit from this diversity. The accompanying Policy Implementation Framework specifically mentions capacity building for communities on:

- management of county *in situ* and *ex situ* conservation station/centres
- production, good agricultural practices and sustainable harvesting
- enterprise development and commercialization
- processing and value addition
- land use and integrated soil management
- use of resilient biodiversity to adapt/mitigate against climate change

The impacts of these provisions will be monitored during implementation of GP/2018/101, but are expected to lead to improved livelihoods and broad-based health and economic growth.

8.3 Community impacts – now and in 5 years

The many awareness–raising events organised in Busia, particularly the Agricultural Fair carried out on 6 July 2018, have increased community participation in managing biodiversity and changed peoples' attitudes towards local foods. It is felt that the fairs have contributed to raising the profile of African Leafy Vegetables and are encouraging consumers, schools, youth, policy-makers and farming communities to make continued use of local crops and varieties.

The positive downstream impacts that have been recorded as a result of the Busia approach in addition to the ones reported for HORT/2014/100 are described below. However, these remain limited in scope and cannot be considered statistically significant. For this reason, SRA GP/2018/001 will help establish the baseline for economic, social, dietary and environmental variables in order to more rigorously measure the impacts of promoting the approach in Kenya and in neighbouring East African countries.

8.3.1 Economic impacts

Under SRA HORT/2014/100 preliminary evidence of the economic impacts on the farmer group linked to St. Mary's Mundika Secondary School was obtained. The farmer group continues to sustain the market linkages established with the school under an agreed Memorandum of Understanding and was able to leverage additional support from USAID in the form of a greenhouse, training on greenhouse production and fruit seedlings. The support has allowed farmers to expand their production to include other nutritious crops and provide a broader range of foods to the school kitchen.

Due to the nature of the project, these findings have not been adequately documented but will be the focus of SRA GP/2018/101 commencing in the latter half of 2018. The new SRA will provide a comprehensive diagnostic analysis of the agricultural, economic and value chain, and health settings in Kenya, Ethiopia, Uganda and Tanzania that can be used as a benchmark for future analysis aimed at evaluating the health, economic and environmental impacts on communities in these different geographical settings through the introduction of nutrient-dense foods in national school meal programmes.

Broad-based economic benefits have been reported and quantified for similar models leading to increased household investments in productive assets (Molinas and de la Mothe, 2010).

8.3.2 Social impacts

The Busia approach to community empowerment has connected overlooked resources such as African Leafy Vegetables to marginalized youth. The results of training and school garden establishment carried out as a continuation of HORT/2014/10 have resulted in proud students becoming active members of the local food system, embracing new skills, and sharing their healthy produce with others.

In developing countries such as Kenya, the harsh effects of malnourishment are especially felt by youth with disabilities, who are excluded due to persistent social stigmatization (families often hide children with special needs from the public eye, making it difficult to even to estimate their numbers). Despite efforts by the Government of Kenya to address these issues with Special Needs Education, many children still go hungry. The principal of Mundika Special School for the Deaf admitted that because many families drop off their children without paying, funding is short and it can be difficult to procure sufficient food, particularly during the dry season. With climate change, it becoming more common for local agriculture to face shortages. Being able to set up and care for a school-garden has boosted the students' confidence and started breaking down social stigmas.

8.3.3 Environmental impacts

As mentioned in previous reports, the scope of this SRA did not include the direct monitoring of environmental impacts. That said, the sustainable agricultural practices being promoted by SINGI help prevent soil erosion and preserve soil moisture under drought conditions, thus putting less pressure on available water resources, one of the most limiting factors in scaling up the model. Composting, also being promoted as part of the trainings, helps improve soil quality and increase plant nutrient uptake in an area where soil fertility is steadily declining due to the absence of crop rotation on limited arable land. With the introduction of organic matter, soils are better equipped to retain moisture and resist compaction thus reducing erosion and run off. While African Leafy Vegetables are well adapted to growing in poor soils and are more resistant to pests and diseases, thus requiring limited pesticide use.

Promoting this portfolio of biodiversity, including associated traditional knowledge has an important role in ensuring that agricultural landscapes are sustainable and provide options for future adaptation to a changing climate. Secondly, enhancing the diversification and resilience of agro-ecosystems improves their capacity to withstand the impacts of predicted climate change scenarios, such as extended periods of drought and increased frequency and intensity of extreme weather events.

8.4 Communication and dissemination activities

In the reporting period, considerable efforts were placed into communicating the emerging outputs and results from HORT/2014/100 and this SRA. Aside from the Busia approach being sought out by the UNSCN for inclusion in its Discussion Paper on *Schools as a System to Improve Nutrition*, project representatives took part in a number of international and national conferences, such as the 3rd Annual Agriculture, Nutrition and Health Academy in Ghana, where the presented poster won the 'best poster' award. The project received considerable attention and endorsement at the conferences listed below while two travel fellowships were obtained from the Agriculture Nutrition and Health Academy (ANH) and the Planetary Health Alliance (PHA) 2018 meetings to support travel and attendance for one project member from Kenya. The project also took part in the NkuKu4U gathering in Tanzania organised by Sydney University.

Strategic level stakeholder engagement

21-25 May 2018 - 1st International Nutrition & Dietetics Scientific Conference (Pwani University, Kilifi County, Kenya). Three abstracts and posters were presented. A variety of indigenous foods and value added products were displayed in a dedicated stand. Considerable interest was shown in the Busia approach, with Kenyatta hospital in Nairobi indicating they would be interested to test a similar approach for the supply of indigenous vegetables to the hospital.

29-31 May 2018 - Planetary Health Alliance meeting (Edinburgh, UK). A poster was presented on *Improving efficiency in the food system and environmental conservation through agricultural biodiversity in Busia County*. The conference abstract was included for publication in the Lancet Planetary Health Journal https://www.thelancet.com/pdfs/journals/lanplh/PIIS2542-5196(18)30092-5.pdf

25-29 June 2018 - 3rd Nutrition and Health Academy week (Accra, Ghana). A poster was presented on *Improving nutrition, health and environmental conservation through local biodiversity in Busia County*.

11-12 July 2018 - Nkuku4U conference (Dar salaam, Tanzania). Organised by the University of Sydney, the conference focused on strengthening food and nutrition security through a Planetary Health lens in in resource-limiting settings. One paper and one poster were presented at the conference, while a 2-hour learning lab on 'Local food biodiversity for dietary diversity' was coordinated by Bioversity International.

Tactical/operation level engagement

On 6 July 2018, the Kenya Agricultural and Livestock Research Organization (KALRO) organized an academic and agricultural day at St. Mary's Mundika secondary school bringing together more than 800 participants from NGOs, universities, the agriculture and nutrition sectors, hospitals, neighbouring county government and schools, as well as farmers and parents. Focusing on the Busia approach of linking smallholder farmers to school procurement, the event was used to highlight the many benefits engendered by the approach such as the economic benefits for the school - more than 12% savings reported per year for vegetable purchases alone – the improvements in academic performance and dietary diversity, as well as the more intangible advantages such as the School's heightened corporate responsibility and the farmers' standing within the community. During the event, students were able to demonstrate their talents in academic and co-curricular activities while the Namalenga farmer group exhibited the indigenous vegetables used in the approach and the sustainable agricultural practices adopted in their production. Agricultural exhibitions, elocution demonstrations, mock matches and drama activities were also held.

Much like the submission to the Farming for Biodiversity worldwide competition, Bioversity submitted an application on behalf of SINGI, to the Spindle Initiative Now Us! Award http://thespindle.org/now-us-award-application/ - a Dutch learning platform aimed at sharing innovative approaches and solutions for inclusive, sustainable development. The submission focused on SINGI's intervention at Mundika Special School for the Deaf (see *Section 8.2*). SINGI's intervention at the school for the deaf was presented as an inclusive community empowerment approach that connects the overlooked resources of the environment with the most marginalized youth in the community. A short video was prepared on the story for submission https://www.youtube.com/watch?v=elq3m9cG45I. Results of the competition are yet to be announced.

9 Conclusions

The ACIAR-funded project *School Food Revolution* has succeeded in its intent of identifying the knowledge gaps that remain to ensure the approach can be trialled in different geographic locations as well as the key researchable issues linked to the approach. It has also helped forge the necessary partnerships to support and carry out this analysis and has resulted in a 'business case' for rolling out and evaluating a novel food procurement and school feeding approach tested in Busia to a range of new situations in Kenya, Ethiopia, Uganda and Tanzania. The four country teams were formed as part of the new SRA GP/2018/101, a technical inception workshop was held in July 2018 and research activities are to commence at the beginning of September 2018.

As mentioned in Section 7, political support and an enabling policy environment are key for approaches such as the one tested in Busia to succeed. The endorsement of the Busia Policy in early 2018 has put the replication and scaling out strategy of the Busia approach on much stronger footing in Kenya and has created a blueprint for neighbouring counties/countries. The inclusion in its programme of work of several provisions that relate to building the capacity of entrepreneurial farmers to manage and sustainably make use of local biodiversity should ensure sustainability at the national level. This is complemented by strengthening community linkages with government agencies, non-governmental agencies and private sectors and links to ongoing government and non-governmental activities.

Engagement with UN agencies and other international partners also demonstrates interest for the approach particularly as WFP will soon stop funding the national school feeding programme in many East African countries and is looking for sustainable alternatives. Linking with other international partners such as the Partnership for Child Development (PCD), World Veg and the Healthy Food Systems Node at the Charles Perkins Centre, University of Sydney, has presented numerous opportunities to share and exchange information and resources deriving from this project at a much broader level.

9.1 Recommendations

Recommendations stemming from this project are comparable to those made in previous SRAs, and will to some extent be addressed by GP/2018/101 and subsequent proposals:

1. More rigorous, in-depth evidence-based assessments are needed of the impact and effectiveness of using the Busia approach in different geographic locations to promote economic empowerment of smallholder enterprises and sustainable diets through diversification of school procurement using environmentally-friendly underutilized, micronutrient-rich crops

2. Alignment with national research and development issues and priorities is key to ensuring buy in for the project and to ensure that relevant research outcomes and knowledge products are taken up and shared nationally, regionally with the Eastern African Network (EAN) and with Africa's policy framework for agricultural transformation – the Comprehensive Africa Agriculture Development Programme- as well as globally.

3. Although partnerships to carry out the research project have been identified, additional partnerships that can help roll out the pilot model to a larger number of locations and have a broader outreach is advisable. This is already happening with Bioversity engaging a number of UN agencies in the new SRA.

4. Wider national promotional, awareness and information-sharing activities campaigns would enhance the sustainability of the model by encouraging others to get involved on a wider scale.

10 References

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SINGI (2017) Report on impact of linking farmers to markets: Achievements, Opportunities and Challenges in Busia County

SINGI (2017) Study report on the feasibility of negotiating a guaranteed price for producers in institutional markets and methods for developing a sustainable supply chain model

10.2 List of publications produced by project

Brochures/Information sheets

ACIAR project. (2017) School Food Revolution: Evaluating opportunities for further research. Field trip program – 6-7 July 2017

ACIAR project. (2017) Linking Smallholders to Markets: Pilot study on developing value chains for conserving local biodiversity and improving diets in Busia County, Kenya

Blogs

Wasike, V. and Manjella A. (2018) Disability is not inability: growing indigenous vegetables at Mundika Special School for the Deaf. http://www.b4fn.org/from-the-field/stories/bdisability-is-not-inabilitynbspbbgrowing-indigenous-vegetables-at-mundika-special-school/

Papers/Books

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Reports

Bioversity International (2018) Report on the Busia food procurement and school-feeding model, capturing learnings and identifying remaining knowledge gaps and opportunities. Results from a Stakeholder workshop 3-7 July 2017. Rome, Italy

Borelli T., Wasike, V., Manjella A. and Hunter D. (2018) HORT/2014/100 - Final report. Linking smallholders to markets: pilot study on developing value chains for conserving local biodiversity and improving diets. ACIAR.

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Posters

Wasike V.W., Manjella A., Borelli T., Hunter D., Lauridsen N., and Gee E. (2018) *Influencing Policy: Linking Biodiversity and Nutrition in Western Kenya*. Presented at the First International Nutrition & Dietetics Scientific Conference. Pwani University, Kilifi County, Kenya 21-25 May 2018 (Appendix 4.1)

Manjella A., Wasike V.W., Borelli T. and Hunter D. (2018) *Improving efficiency in the food system and environmental conservation through agricultural biodiversity in Busia County*. Presented at the Planetary Health Alliance meeting. Edinburgh, UK, 29-31 May 2018. (Appendix 4.2) The conference abstract was included for publication in the Lancet Planetary Health Journal https://www.thelancet.com/pdfs/journals/lanplh/PIIS2542-5196(18)30092-5.pdf

Manjella A., Wasike V.W., Borelli T. and Hunter D. (2018) *Improving nutrition, health and environmental conservation through local biodiversity in Busia County*. Presented at the Third Nutrition and Health Academy week. Accra, Ghana. 25-29 June 2018 (Appendix 4.3)

Manjella A., Wasike V.W., Borelli T. and Hunter D. (2018) *Mainstreaming Biodiversity Conservation and Utilization for Improved Nutrition in Kenya: The case of communities in Busia County, Kenya*. Presented at the Nkuku4U conference. Dar salaam, Tanzania, 11-12 July 2018 (Appendix 4.4).

11 Appendix

The Appendices are added in a separate zip.file as part of this report

Appendix 1 – Outputs for Objective 1

- Appendix 1.1. - *Report on identified production and supply side constraints for the promotion of local nutritious crops in Busia County. Results from a Consultative workshop 23-24 September 2015*
- Appendix 1.2. - *Report on impact of linking farmers to markets: Achievements, Opportunities and Challenges in Busia County*
- Appendix 1.3. - *Study report on the feasibility of negotiating a guaranteed price for producers in institutional markets and methods for developing a sustainable supply chain model*

Appendix 2 – Outputs for Objective 2

- Appendix 2.1. – *Busia Stakeholder workshop report 3-7 July 2017*
- Appendix 2.2. – *Barriers, constraints and lessons learned*
- Appendix 2.3. – *Workshop 3-7 July presentations*
- Appendix 2.4. – *ACIAR Busia project background document*
- Appendix 2.5. – *Busia Field Trip Brochure*
- Appendix 2.6. – *ACIAR Research and Workshop Info note*

Appendix 3 – Outputs for Objective 3

- Appendix 3.1. – *GP/2018/101 Proposal document*
- Appendix 3.2. – *GP/2018/101 Proposal budget*

Appendix 4 – Outreach material

- Appendix 4.1 – Poster presentation at First International Nutrition & Dietetics Scientific Conference. Pwani University, Kilifi County, Kenya. May 2018
- Appendix 4.2. – Poster presentation at the Planetary Health Alliance meeting. Edinburgh, UK, 29-31 May 2018
- Appendix 4.2. – Poster presentation at the Third Nutrition and Health Academy week. Accra, Ghana. 25-29 June 2018
- Appendix 4.4 - Abstract presented at the Nkuku4U Conference – July 2018