Institution: University of Greenwich

Unit of Assessment: 22 – Anthropology and Development Studies

Title of case study: Empowering farmers' organisations to promote agricultural risk management (ARM) tools in Africa: lessons from action research projects led by University of Greenwich

Period when the underpinning research was undertaken: January 2000 - February 2018

Details of staff conducting the underpinning research from the submitting unit:

Name(s):	Role(s) (e.g. job title):	Period(s) employed by submitting HEI:
Dr Gideon E. Onumah	Agricultural Marketing/Finance Economist	09/08/1999 – present
Jonathan Coulter	Principal Scientist	01/05/1996 – 31/01/2009
Prof. Ben Bennett	Professor of International Trade and Marketing Economics	01/05/96 – present
Baqir Lalani	Research Fellow, Value Chain Economics	18/10/2016 – present

Period when the claimed impact occurred: August 2013 - July 2020

Is this case study continued from a case study submitted in 2014? N

1. Summary of the impact

More than 500,000,000 smallholder farmers in Africa are at risk of high levels of losses prior to or after harvest due to variability in the weather, incidence of plant and livestock diseases and pests as well as uncertainty in accessing markets in which prices tend to volatile. In response to this, researchers from the University of Greenwich's (UoG) Natural Resources Institute (NRI) have, since 2000, been undertaking action research to develop sustainable, market-based agricultural risk management (ARM) tools which can be used by smallholder farmers. This included leading a consortium of research institutions and farmers' organisations (FOs), under the Farm Risk Management for Africa (FARMAF) Project, to identify critical factors which enable FOs to successfully promote ARM tools. Over **320,000 smallholders (about 25% women) directly benefited from FARMAF in Burkina Faso, Tanzania and Zambia** as detailed in Section 4. The UoG research also fed valuable inputs into crucial policies, including **management of food insecurity risk at the continental level by the Africa Union** and in **improving the performance of agricultural markets in Islamic states** across the globe.

2. Underpinning research

Over 500,000,000 smallholders, with an average farm size of 1-2ha, dominate agricultural production in Africa but **face a range of output-reducing weather risks** (e.g. drought, floods and erratic rainfall) as well as **crop/livestock pests and diseases**. They also face **uncertain access to quality inputs and remunerative output markets**, which increases their vulnerability to volatility in producer prices. A number of studies confirm this problem, including one commissioned by Platform for Agricultural Risk Management (PARM) and led by **Onumah** (see http://www.p4arm.org/document/agricultural-risk-assessment-study-in-ethiopia/). Unlike farmers in advanced economies, **African smallholders lack access to effective ARM tools and usually rely on suboptimal strategies**, ending up as low-input, low-productivity producers who are highly vulnerable to food and nutrition insecurity.

Research objectives, approach and results:

Responding to the above, UoG's NRI has, since 2000, been undertaking inter-related action research with the aim of identifying and/or developing viable ARM tools which are accessible to smallholders. The related aim is to identify the most effective means to promote the tools in Africa. The research includes trailblazing work on output market innovations such as warehouse receipt systems (WRS), ensuring that they are customised to suit to the needs of smallholders in Africa. This effort was led by **Coulter** and **Onumah** *(one outcome is a seminal paper **3.1**)*. NRI also carried out research aimed at improving market information systems (MIS) in order to optimise benefits to smallholders. This was led by **Onumah**, **Bennett** and **Lalani** (***3.3***). In addition, it has engaged in research to identify success factors in empowering FOs as they pursue advocacy for policy/regulatory reforms needed to sustain efficient agricultural inputs/output markets which are open to smallholders. This was led by Proctor and **Onumah** (***3.2***).

An important conclusion from these research efforts is that success in promoting ARM tools which are accessible to smallholders requires a holistic approach that integrates/reinforces synergies

between different tools targeting risks that are prevalent before and after harvest. Furthermore, national FOs need to play a lead role in project design and implementation if the ARM tools are to be well-aligned to the needs of smallholders and to the national policy and regulatory context. This is critical if an enabling policy/regulatory environment needs to be created for the ARM tools.
To validate the above, the UoG's NRI led a consortium to propose a research project titled Farm Risk Management (FARMAF), eventually accepted and jointly funded (€4,712,442) by the European Union and Agrinatura (which brings together European agricultural education and research institutions). In addition, to providing overall lead management of FARMAF, NRI was directly responsible for promoting markets innovations (led by G. **Onumah**). The other participating research institutions in the consortium were: Wageningen University and Research (WUR) in the Netherlands (which led in developing agricultural insurance products) and the Centre de Coopération Internationale en Recherche Agronomique pour le Développement (CIRAD) in France, which led in scaling-up MIS and in carrying out monitoring and evaluation. The consortium also included the following national FOs: Conféderation Paysanne du Faso (CPF) of **Burkina Faso**, MVIWATA of **Tanzania** and the Zambia National Farmers Union (ZNFU) of **Zambia**.

The research process involved the following:

a. Needs identification and prioritisation of required actions by national FOs.
b. Design/sequencing of country-specific actions based on national priorities and informed by evidence on feasible ARM tools (synthesised by the collaborating research institutions).
c. Mobilisation of national stakeholders, including private service providers.
d. Capacity building and tool-specific technical advice by collaborating research institutions.
e. Advocacy for the creation/maintenance of enabling policy/regulatory environment, led by FOs (sometimes involving grassroot membership) and supported with cross-country evidence by the collaborating research institutions.
f. Monitoring and evaluation of project outcomes by the collaborating research institutions.
g. Cross-country lesson-sharing.

Evidence from FARMAF confirmed the following:

- Innovative output marketing systems, e.g. WRS, can be accessed by smallholders when organised as groups, facilitating aggregation building capacity to comply with the quality standards in formal markets. Access to formal markets enables smallholders to obtain higher margins because they are able to sell quality produce and in sizeable volumes. *(consistent with conclusions in citation in **3.1**).*
- A reliable and timely MIS is crucial in allowing smallholders to adopt marketing strategies that offer higher returns. The MIS, however, needs to consist of rapid dissemination systems (e.g. mobile telephony); have content that is highly informative including reporting different prices for different quality standards; and also track trends in available stocks and demand for informed marketing decisions. ***(3.3** and referred to in **5.2)***.
- Smallholders access to finance can be eased when they use WRS to reduce the risk of loan default ***(3.1, 3.4** and referred to in **5.5).*** Their access to finance is also boosted when insurance is bundled with cashless loans (involving direct payments to inputs suppliers by lenders) and coupled onto secure output marketing systems (e.g. WRS) ***(**see **5.5** and impact assessment report on **Burkina by Le Cotty et al. 2019** referenced in Section 4 below)**.***
- A disabling policy/regulatory environment hampers the development of ARM tools and change often entails a long and protracted process. Empowered FOs can lead advocacy for reforms, even beyond the life of a project, thereby ensuring sustainability. This needs building capacity to generate evidence for action, including through cross-country lesson-learning ***(3.2).***

3. References to the research

1. **Coulter** J. and G. **Onumah** (2002) "The role of warehouse receipt systems in enhanced commodity marketing and rural livelihoods in Africa", *Food Policy*, Vol. 27, No. 4. 319-337. https://doi.org/10.1016/S0306-9192(02)00018-0
2. Ton G., K. Grip, F. Lancon, G. **Onumah** and F. Proctor (2014) "Empowering Smallholder Farmers in Markets: Strengthening the advocacy capacities of national farmer organisations through collaborative research" *Food Security*, Vol. 6 pp. 261–273. https://doi.org/10.1007/s12571-014-0339-3 ***[REF2 Submission - Identifier 16837]***

3. **Onumah** G., U. Kleih, B. **Bennett**, J. Priebe and B. **Lalani** (2018) "Improving Agricultural Market Performance: Developing Agricultural Market Information Systems", Report published by Organisation for Islamic Cooperation, Feb. 2018 http://www.comcec.org/en/wp-content/uploads/2018/04/11-AGR-AN.pdf.
4. **Onumah** G (2012) "Warehouse receipts and securitisation in agricultural finance to promote lending to smallholder farmers in Africa: potential benefits and legal/regulatory issues", *Uniform Law Review*, Vol. 17, 2012, p.351-367, https://doi.org/10.1093/ulr/17.1-2.351.
5. Chapoto A., M. Demeke, G.E. **Onumah** and H. Ainembabazi (2016) "Getting more for farmers from postharvest to markets". Chapter 6 in AGRA (2016) Africa Agriculture Status Report 2016 (available at: http://reliefweb.int/sites/reliefweb.int/files/resources/assr.pdf)

Research grant: Accessible systems to manage risk in family agriculture in Africa (Later changed to Farm Risk Management for Africa (FARMAF)), European Union and Agrinatura, UOG, Onumah (PI), Contract number: DCI-FOOD 2011/260-875, Dec 2011 - 2016, £3,927,035.

4. Details of the impact

In total over 320,000 smallholders benefited from the research in the three focal countries. The pathways to impact proceeded from **research actions/inputs** (based on farmers' needs, national context and priorities set by national FOs; and enabling actions e.g. policy/regulatory reforms), to **outputs/outcomes** (indicating level of uptake and direct benefits), to **impact (**including benefits to wider population and indications of sustainability). The outputs and impacts from FARMAF across the three pilot countries are contained in the project completion report (**5.1**) and summarised in this section.

Inputs in **Burkina Faso** reflected the priorities identified by CPF and focused on improving the existing WRS model, which is commonly known in Francophone West Africa as *warrantage* and encourages grain storage in small (50 – 100t) capacity warehouses in order to assure food availability during the "hunger season" (when food supplies are low and prices are high). One of the pioneers of this model in Burkina is the *Comunità Impegno Servizio Volontariato (CISV*), an international NGO with affiliates in over 66 countries. "Green belt" communities in the South West of Burkina (with no previous WRS pilots) were purposively selected to pilot the improved model. This required building similar size warehouses (each 60t-capacity) in six communities in 2012/13. The improvements included adopting a grain Quality Assurance System (QAS) to enable farmers to sell directly to major formal buyers. The QAS consisted of: a set of minimum grain quality parameters acceptable to formal buyers; a laboratory with equipment and trained staff to assess compliance prior to acceptance of grains for storage; certification of quality prior to delivery to buyers; and guarantees to maintain quality whilst stocks are in the warehouse. Participating smallholders were enabled to access reliable market information via mobile phones and linked to three local microfinance institutions (MFIs) offering farming loans (bundled with weather indexed insurance (WII)) as well as inventory credit (secured against the stored grains). Planet Guarantee, a local microinsurance provider, received technical assistance in order to offer tailored WII to participating smallholders. Capacity building e.g. training CPF personnel to provide "regulatory" oversight of the WRS; of staff of the laboratories to enforce QAS; and of farmers, to facilitate compliance with the set quality standards for depositing grains.

Between 2014 and 2016, over 33,200 smallholders have benefited from these actions. During the period, average occupancy rates at the warehouses exceeded 85%. The strict enforcement of the QAS and the capacity-building provided enabled the smallholders to sell directly to formal buyers, including WFP and the state-owned grain trading company (SONAGESS). The premium prices they obtained exceeded prevailing farmgate prices by 45-60%. They were also able to obtain crop production loans (estimated at about USD150 per farmer), making it possible to increase the average area cultivated by about 2ha per farmer (more than doubling the average farm size of 1.2ha). In addition, the volume of inorganic fertilizer they used doubled to an average of about 260kg per hectare, resulting in a rise in average yield per ha from 1.5t to over 3.5t for maize.
An **impact assessment** undertaken by Le Cotty et al. in December 2016 (i.e. independent of NRI), showed an increase in food availability in the participating household by more than 30% (i.e. an extra 300kg of grains). Some of the farmers interviewed during the assessment stated *"We have*

more food during the "hunger season" because we produce and can keep about 40% of what we store in the warehouses for the home – the stores are well-run so we don't lose any grains to rodents". Others added *"because we get better prices from selling to big buyers we can now afford other nutritious foods"* (T. Le Cotty *personal communications 25th October 2018*). The quantitative data assessed during that study confirmed that the food diversity score of the participating households rose by more than 50%. The rise in average household income by over 45% was not only from the sale of grains but also from investing part of the inventory credit they obtained in expanding cash crop production (e.g. cotton) and/or in livestock fattening (especially by younger smallholders). The impact assessment results are in **Le Cotty et al. (2019) "Inventory Credit as a commitment device to save grain until hunger season",** ***American Journal of Agricultural Economics, DOI*****: 10.1093/ajae/aaz009*.**

Issoufou Porgo (CPF Programme Manager) in his testimonial (appended as **5.4**) mentions some benefits to smallholders who used the WRS, including the ability *"…to delay crop sales, waiting for about 2-3 months* (after harvest) *before selling the bulk of their produce* (and) *… to sell directly to formal buyers, earning premium prices which were higher than prevailing farmgate prices by 45-60%".* He adds that *"the benefits from the system boosted rural demand for storage services"* and encouraged private operators in 2016/17 "*to invest in the construction of three larger warehouses, each with a capacity of 500 tonnes. The facilities were cited close to laboratory facilities in the project catchment area near the city of Bobo Dioulasso. This was to make it possible for depositors to take advantage of the QAS … so they can sell directly to formal buyers.* Issoufou notes also that *"the outcome of the research actions caused a change in the WRS model that the Comunità Impegno Servizio Volontariato (CISV) had been promoting in Burkina Faso in 2017.* His testimonial also confirms that, as a result of their experience from FARMAF, CPF became an important player in national policymaking regarding WRS and crop insurance. They also shared their experience with other FOs in West and Central Africa".

In **Tanzania,** MVIWATA prioritised strengthening output marketing tools, including the commercial WRS, which NRI had been involved in promoting in the country since August 2004. This WRS model involves the delivery of commercial storage services by private operators. The average capacity of the warehouses is 5,000t and the minimum volume delivered per depositor is 5t. Most smallholders, therefore, deposit as groups. The actions implemented in 2012-16 included tightening up the WRS regulatory system to protect depositors and lenders and to guarantee delivery to buyers (essential if it is to back exchange trading – an ambition of the government). The directors of the regulatory agency, including two farmers' representatives nominated by MVIWATA, were trained to ensure effective oversight of the licensed warehouses. In addition, a MIS managed by MVIWATA was improved through investment in equipment and training for the staff. Access to the MIS was promoted through sensitisation events, and the supply of inventory finance for smallholders was catalysed through training for cooperatives and farmers' groups. The capacity of MVIWATA and its grassroots membership was strengthened to enable them to pursue sustained policy advocacy, especially, for the government to avoid distorting markets through setting of flour prices.

By the end of 2016, over 82,000 smallholders benefited from directly accessing the MIS, some of them being enabled to take advantage of information on price differences in various markets to earn additional income of about 55%. **Stephen Ruvuga (ED of MVIWATA)** quotes a farmer as saying: ***"****Through market information, I was sure of prices in the markets I wanted to sell in. I took maize from Kibaigwa where the price was Tanzania Shillings 600 to Igunga where it was Tanzania Shillings 950. I sold more than 400 tonnes for our group and from my personal profits I managed to buy a 30-ton truck. I now own my truck and I frequently trade between Igunga and Kibaigwa after checking prices on the system." (Anania Madono, Pandambili-Kibaigwa).* Stephen adds in Testimonial **5.2** that more than 135,000 smallholders collectively marketed coffee, cashew and sesame through the WRS, earning incremental net income of about 30-35%.

For MVIWATA, it is apparent that one of the greatest achievements is in sustaining advocacy which helped to dismantle the policy bottlenecks hampering the development of the Tanzania Mercantile Exchange (TMX) in late 2019. This paved the way for TMX to be officially launched in

May 2020. *"Within six months of its operation, over 30,000 smallholders (in groups) have traded sesame and cashew through the exchange, getting net prices which are about 55% higher than what is available in the alternative informal marketing system"*. (**5.2, 5.3**).

One of the main actions prioritised in **Zambia** was advocacy for the government to reinstate the Zambia Agricultural Commodity Exchange (ZAMACE) and the WRS it runs. Paraphrasing a report by its CEO (Mr Mwale), *after being reinstated in 2014, ZAMACE was able to launch an innovative inputs finance scheme under which smallholder groups bought inputs on credit secured against stocks in ZAMACE-certified warehouses. In 2016 inputs valued at over US$2,400,000 was financed through this scheme at very low cost of borrowing (about 1-2% compared to 14-18% under the most attractive bank lending terms in the country)*. (See Testimonial **5.5**).

Mr Mwale also confirmed that high on the agenda was integrating the Exchange into a highly successful farming loan scheme involving bundling of insurance with credit. The scheme was initiated 2008 and involved provision of crop insurance by Zambia State Insurance Corporation (ZSIC) and in 2013/14 by Mayfair Insurance Company. Credit was provided by Zambia National Commercial Bank (ZANACO). In the absence of the Exchange, forward sales contracts had to be secured with credible formal buyers. Evidence confirms that despite the fact that insurance premiums and interest rates on farming loans were not subsidised, the number of participating smallholders increased more than 8-fold from the end of 2011 to end of 2015 (from 2,220 to 18,690 farmers) (**5.5**). For the participating farmers, gross farm income almost doubled during that period as a result of over 30% expansion in area cultivated. Average size of credit accessed per farmer increased by 50%, making it possible to intensify use of inputs with consequent increase in farm productivity. For example, average yield for maize (the most important staple) increased by about 75% from 2t to 3.5t per hectare. In addition to the smallholders who benefitted from the insurance/credit bundle, over 45,000 others gained from receiving better market information and from accessing electronic extension delivery services in Zambia (**5.5**).

The above success story encouraged the Government of Zambia to partner with a private insurance company supported by the International Finance Corporation to begin implementing a programme to roll out crop insurance in 2017. The long-term goal is to reach 1,000,000 smallholders(*https://ifcndd.ifc.org/ifcext/pressroom/ifcpressroom.nsf/1f70cd9a07d692d685256ee1001cdd37/42920c04ee5171f48525821900496b6b?OpenDocument*).

Evidence from UoG's research is feeding into policy processes at very high levels such as the Africa Union (**5.6**); the Alliance for a Green Revolution in Africa (AGRA) (**3.5**); the Organisation of Islamic Cooperation (**3.3**); and PARM, which is hosted by the International Fund for Agricultural Development (IFAD) – (see details in Section 2 above).

5. Sources to corroborate the impact

1. Corroborator: FARMAF Project Completion Report submitted Nov 17 (not yet made public). For details: European Commission Directorate-General for International Cooperation and Development (DG-DEVCO), Rue de la Loi 41 1049 Bruxelles, Belgique. For attention of Ms Barbara Dequinze, International Aid Officer, Eastern and Southern Africa [Contact details provided per designated channel]
2. Testimonial: Stephen Ruvuga, ED MVIWATA, Tanzania
3. Corroborator: Mr Godfrey Malekano, M. D., Tanzania Mercantile Exchange (TMX), Dar es Salaam [Contact details provided per designated channel]
4. Testimonial: Issoufou Porgo, Programme Manager, Conféderation Paysanne du Faso (CPF), Ouagadougou, Burkina Faso
5. Testimonial: Jacob Mwale, CEO, Zambia Agricultural Commodity Exchange (ZAMACE), Lusaka, Zambia
6. (a) AUDA-NEPAD, Johannesburg, South Africa: Knowledge Compendium on Domestication of Malabo Declaration (Chapter 6)

https://www.nepad.org/publication/knowledge-compendium-domestication-of-malabo-declaration. (b) Corroborator: Ms Zodidi Sivetshe, Programme Officer, AFIRM-Sustainability Programme, AUDA-NEPAD [Contact details provided per designated channel].