



Contract farming and public–private partnerships in aquaculture

Lessons learned from East African countries



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bottom right: Farm integrated with chicken houses. Rwanda. @FAO Aquaculture photo library

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FAO
FISHERIES AND
AQUACULTURE
TECHNICAL
PAPER

623

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ISBN 978-92-5-130711-3

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Preparation of this document

This technical report was prepared under the coordination of Uwe Barg and Ana Menezes of the Aquaculture Branch, FAO fisheries and aquaculture department as part of FAO Strategic Objective (SO3): Reduce rural poverty. This publication will contribute to FAO Strategic Objective 3 (SO3/001), “the rural poor have enhanced and equitable access to productive resources, services, organizations and markets and can manage their resources more sustainably”, and SO3/002: “the rural poor have greater opportunities to access decent farm and non-farm employment.” The rationale behind this study is to provide resource information, coming as it does at a time when there is limited systematic information available about the current experiences and best practice for using contract farming and public–private partnerships to initiate programmes in aquaculture and poultry farming.

This study, and the publication of the document, were partially funded under the auspices of the “Promoting Agricultural Diversification to Reduce Poverty, Fight Malnutrition and enhance Youth Employment Opportunities in Eastern Africa GCP/SFE/001/MUL” project, which was financed by The African Solidarity Trust Fund (ASTF).

The authors gratefully acknowledge the contributions of the following individuals in the preparation of this report: Ms Elisabetta Martone, for the inputs and active support; Ms Marianne Guyonnet, for overall coordination of publication process; Ms Danielle Rizcallah, for her assistance in quality control and FAO house style; Mr Edward Fortes, who edited the text for linguistic quality and technical content; and Ms Chorouk Benkabbour, who prepared the layout design for printing. Finally, Dr Malcolm Beveridge, Head of the Aquaculture Branch of the FAO fisheries and aquaculture Department is acknowledged for providing the necessary support, advice and insight to complete this publication.

Abstract

Securing decent work for young people in Africa is critical given the large numbers of young people entering the labour force each year (about 11 million). With few opportunities for formal employment in manufacturing and services, agribusinesses offer young people the opportunity to earn income in rural areas. If others emulate them, there is the potential for positive regional spillovers. One institutional innovation that enables young people to mitigate financial and knowledge handicaps is contract farming. By supplying their produce to a third party (such as an agri-processor or retail outlet), which in return guarantees markets and often inputs, young workers are able to access credit, markets and technology. This can be a “win-win” solution because young workers gain access to markets, while the private company has access to produce without having to either acquire land or supervise labour. Fiscally constrained governments also benefit because private sector involvement obviates expenditure and reduces risks, and may also provide expertise unavailable in the public sector.

This report presents the lessons learned from a project in four East African countries – Burundi, Kenya, Rwanda and Uganda – focusing on youth and their agribusinesses. In Burundi and Rwanda, poultry and eggs were sold to retailers but were also provided to schools to alleviate malnutrition. In Kenya and Uganda the focus was on fish farming, raising finfish in cages and selling fingerlings. Partnering with private companies enabled young people to obtain business and technical knowledge in addition to a market for their produce.

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Abbreviations and acronyms

ACE	Audio Conferencing for Extension
ABFL	Aftab Bohumukhi Farms Ltd
AGRA	Alliance for a Green Revolution in Africa
AGRIC-YES	Agriculture Youth Empowerment Scheme
ASCA	Accumulating Savings and Credit Association
ASTF	African Solidarity Trust Fund
BAP	Best Aquaculture Practices
BFAR	Bureau of Fisheries and Aquatic Resources
CF	Contract farming
CIG	Common Initiative Group
CP	Charoen Pokphand
DISC	Developing Innovation in School Cultivation
DOCs	day-old chicks
FAO	Food and Agriculture Organization of the United Nations
FSA	Financial services association
GAP	good agriculture practices
GDP	Gross domestic product
GIC	Government of Singapore Investment Corporation
GIZ	Gesellschaft für Internationale Zusammenarbeit
GTZ	German agency responsible for technical cooperation
ICT	Information and Communication Technology
IEC	information, education and communication
IFAD	International Fund for Agricultural Development
iTAP	Industrial Technology Assistance Programme
KOPGT	Kalangala Oil Palm Growers Trust
KTDA	Kenya Tea Development Agency
MSC	Mumias Sugar Company
NGO	Non-governmental organisation
NSTDA	the National Science and Technology Agency
OPUL	Oil Palm Uganda Limited
P4P	Purchase for Progress
PAA	Purchase from Africans for Africa
PPP	Public-Private Partnership
PRICE	Project for Rural Income through Exports
ROSCA	Rotating Savings and Credit Association
RUL	Rivall Uganda Limited
SFE	Subregional Office for Eastern Africa
SMS	School of Marine Studies
SYFN	Savannah Young Farmers Network
UNCTAD	United Nations Conference on Trade and Development
USAID	United States Agency for International Development
WRS	Warehouse receipt system

Introduction

Historically, agriculture has been a critical sector in economic development as a source of labour during industrialization, and a source of food for an ever more urbanized population. This was recently demonstrated during the Green Revolution in Asia, when land productivity increased thanks to the introduction of new varieties of crops, expanded irrigation and an improved use of fertilizer. Small farms were particularly important for rural development. Increased agriculture productivity is equally critical for poverty alleviation in Africa, as is technological innovation. However, unlike the Green Revolution, irrigation in Africa has not been a priority: less than 4 percent of agriculture output is produced under irrigation (Salami, Kamara and Brixiora, 2010). Africa also faces handicaps in terms of infrastructure. In most East African countries half of the population lives five hours or more from a market centre, and in the Republic of Uganda 30 percent of communities do not have access to good roads even in the dry season (Salami, Kamara and Brixiora, 2010).

The importance of agriculture in African development is reflected in its share of employment and the extent of rural poverty. Agriculture employs the majority of the population and poverty is concentrated in rural areas. This report focuses on four countries in East Africa: the Republic of Burundi, the Republic of Kenya, the Republic of Rwanda and the Republic of Uganda. Agriculture continues to dominate the economies of all four countries. In Kenya and Uganda agriculture makes up a 27 percent and 32 percent the share of GDP respectively; this is about average for the continent as a whole, whereas Rwanda (41 percent) and Burundi (46 percent), reveal an above-average dependence on agriculture (Diao, Hazell and Thurlow, 2010). The large labour force engaged in agriculture gives it a weight that other sectors do not have, with agriculture generating higher employment multipliers than industry and services, as reflected in estimates of the sector's elasticity (Furceri, Crivelle and Toujas-Bernate, 2012).

Agricultural growth is particularly important for poverty reduction because poverty is concentrated in rural areas where more than 60 percent of the population continues to live (Diao, Hazell and Thurlow, 2010). Three-quarters of Africa's malnourished children live in rural areas (Haggblade, Hazell and Gabre-Modlin, 2010). In Burundi the rural population is 87 percent of the total population, while in Kenya it is 60 percent, in Rwanda 80 percent and in Uganda 88 percent. These rural areas are home to the majority of the poor. In Rwanda, agriculture accounts for half the average household income nationally, but for the average poor household the share of agriculture increases to three-quarters (Diao, Hazell and Thurlow, 2010). The Kenya and Uganda have shown an overall decline in poverty, but this decline has been most apparent in urban areas.

One challenge to increasing agricultural productivity and growth is the predominance of smallholders. These are farms that primarily rely on family labour and are less than two hectares in size. In East Africa about 75 percent of agricultural output comes from smallholdings and these employ more than three-quarters of the entire labour force (Salami, Kamara and Brixiora, 2010). These smallholdings are not homogeneous, however: a small minority (about 2 to 10 percent) have capital, access to credit and information; another 50 to 60 percent have limited assets, sell surplus produce to local markets, and rely on some wage employment (IFAD, 2014a). The remaining 30 to 40 percent of smallholders are subsistence households, whose production is mainly for home consumption using traditional technology. They are composed largely of landless youths and widows who rely on off-farm income and the occasional sale of crops; the

latter may not be surplus, but they are sold because the need for cash is greater than the food they would otherwise eat (IFAD, 2010). The continued economic and social viability of these subsistence farms is questionable, as is their ability to provide decent work for family members.

One institutional innovation that has been promoted to increase agricultural productivity, particularly on smallholder farms, is contract farming (CF). By linking farmers to the value chain, CF offers a path from subsistence to commercial agriculture for some smallholders, and can provide access to credit, technology and markets. Agribusinesses, whether parastatal or private, have the capital and resources needed. For the agribusiness, CF also obviates the need to acquire land. Policymakers therefore view CF as a potential “win–win” solution for farmers, processors and society. This report examines CF as a tool to promote aquaculture and poultry farming in Burundi, Kenya, Rwanda and Uganda. Fish and poultry are highly perishable, and so need access to processing and food safety controls. Where the state cannot provide the resources or technical information, one option is to partner with a private company; such Public–Private Partnerships (PPPs), are a means of coordinating the value chain through CF and promote agricultural productivity. Agribusinesses, whether parastatal or private, can also provide the capital and resources needed.

Part I of this Report provides an overview of some aspects of CF and PPPs. It is not an exhaustive survey, but focuses on the challenges and best practices when using these schemes to promote youth employment in agriculture or aquaculture. More than half the population of Africa is under 25 years old, and this youth bulge is projected to continue into the next decades. Finding decent work for the eleven million young people who join the labour force each year requires introducing new opportunities to rural areas.

Part II illustrates the implementation of CF and PPP in aquaculture and poultry production. In Burundi, Kenya, Rwanda and Uganda, a project under the African Solidarity Trust Fund has provided funding and training to young people in egg production, chicken rearing and fish farming. These subsectors contribute to reducing malnutrition in the rural population. By promoting entrepreneurship among young people it is hoped that the example will encourage others to follow. Governments have had an enabling and facilitating role, and private partnerships have been developed with feed mills and retail outlets. The potential benefits not only apply to young people, but also local communities as a whole, if youth business activities mitigate food insecurity.

1. Contract farming

1.1 ENHANCING YOUTH OPPORTUNITIES IN AQUACULTURE AND POULTRY PRODUCTION THROUGH THE ASTF EXPERIENCE

In order to alleviate food insecurity, the African Solidarity Trust Fund (ASTF) financed the Subregional Office for Eastern Africa (SFE) Baby projects (1, 2, 3 and 4), which aim to enhance youth employment in the four countries in East Africa by providing training as well as access to financial and trade markets. In Kenya and Uganda, the programme focuses on intensive aquaculture production and marketing, while the focus in Rwanda and Burundi is on the poultry value chain. All Subregional Office for Eastern Africa projects aim to reach targeted beneficiaries that amount to at least 5 000 people per country and a total of 20 000. The PPP component in the ASTF projects will support the local seed and feed manufacturing sector to increase the availability of quality and standardized seeds (one day chicks), and feed for improved productivity.

The main objective of the programme was to contribute to increased food security, livelihood resilience and reduce rural poverty. It aimed to create decent employment opportunities for young people (men and women) in the agricultural sector in order to: (i) improve their income and access to food; (ii) increase the availability of locally produced eggs and fish, and improve vulnerable children's access to these through school feeding programmes as well as households; and (iii) increase the overall productive capacities of both the poultry and aquaculture value chains.

The ASTF project document drawn from lessons learned in past school feeding programmes (Purchase for Progress, P4P, and Purchase from Africans for Africa, PAA), and proposed a new model for the promotion of youth employment: to adopt an integrated approach to enhancing sustainability, one which links youth training aimed at increasing access to resources, finance services and markets, as well as the importance of leveraging private–public partnerships (PPPs), including producers' organizations.

Of the four projects, the ASTF project in Burundi (Baby 1) started in November 2014 but was stalled by political uncertainty in the country. The planned activities include PPP support for inputs for production (poultry seeds, poultry feed manufacturers and vet inputs suppliers) through group orders, contracts and others. However, governance continued to be a challenge for the project. Moreover, there are few companies that can supply feed and pullets, so the lack of competition results in little improvement in the quality of inputs. Complaints about the poor quality of feed, fingerlings and pullet by contracted companies have also been expressed in Kenya and Rwanda.

As of September 2017 the project had 125 beneficiaries, of which 25 were young people and 100 were vulnerable households, mainly headed up by women. Beneficiaries were supported to establish poultry operations for eggs. The young people were fully employed in egg production while the households benefit thanks to better nutrition (although surplus eggs can be sold). The cost of feed has hampered microenterprises set up by the young people, but most of them have renewed their stock. Training on poultry rearing is available and the young people are linked to a microcredit institution. Partnerships have been implemented between the major animal feeds company and a poultry breeder cooperative. High feed costs and inadequate entrepreneurial attitudes are the principal hurdles to sustainability.

The ASTF Baby 2 project also began in Kenya in November 2014, encouraging young people to engage in entrepreneurial activities in aquaculture. The project

gave small-scale producers, primarily young people, the opportunity to increase aquaculture (and poultry) output through training – both in production technology and in management. Assistance with inputs was also available: PPP participation has been designed to support youth inclusion in producers’ associations, and to increase the availability of quality seeds and feed by supporting local manufacturers. An interim report indicated contracts have been signed with selected service providers, farmers, feed manufacturers and seed producers. However, the challenges that are common to CF schemes have emerged: side selling, input diversion, poor quality feeds, lack of guaranteed markets because of lack of formal contracts (e.g. a poultry project in Tharaka), lack of information on markets and one uncompleted PPP agreement.

As of September 2017 the project had over 400 beneficiaries, broadly split between men and women, and including 25 groups with 570 ponds used for aquaculture. Training has been provided to 80 percent of the targeted groups and all are generating a profit from aquaculture. All 13 hatcheries are producing fry and fingerlings, and the 13 groups involved in grow-out activities are marketing their fish (catfish and tilapia) and generating a profit. A partnership has been established with two nuclear farms that provide good training, along with another partnership agreement with the County government on constructing a fish feed mill.

The beneficiaries report that technical knowledge of fish farming, farm management and the large numbers of quality fingerlings are the principal successes. However, there are challenges, chief of which is the scarcity of affordable quality fish feed. There is also doubt about whether all the young people involved will persist with commercial aquaculture once the project ends.

The ASTF project in Rwanda (Baby 3) aims to fight malnutrition and rural poverty by increasing decent employment (particularly for young men and women) in an improved poultry value chain. As with the other countries, the project focuses on the production of seed for poultry and aquaculture value chains, as well as providing assistance to small-scale producers to increase their production sustainably and develop effective market linkages between cooperatives and associations. There is also support for the establishment of small-scale egg production units. As with the other projects, PPP is adopted as a means of providing financial services and market linkages for trained youth. At the time of the interim evaluation, there were requests for partner(s) to provide technical assistance to young farmers (training has been launched on semi-intensive egg production and management techniques with a view to profitmaking). Some of the challenges include: poor quality feeds, side selling, the security of poultry premises, and the small number of input suppliers.

As of September 2017, the project was supporting 225 beneficiaries directly, including 25 rural youth (10 women and 15 men) between the ages of 18 and 35 years old who were unemployed or underemployed, and 200 vulnerable rural households. The households, most of which are headed up by women, were formed into eight groups to establish poultry farm units for egg production. For the young people this is their first full-time employment and each received 330 layer hens. For the women this is a part-time occupation as they have to attend to other household chores and the aim is to improve their families’ nutrition by adding eggs to their diet. Each group of 25 women received 425 layer hens.

All the beneficiaries have reported improved livelihoods. Additional revenue has gone into crop diversification, university tuition fees and local services that create positive “knock-on effect” in the community. As with the other project countries the profitability challenge remains, due to the high cost of feed and fluctuating egg prices. There have also been conflicts within household groups because of different levels of commitment.

The ASTF project in Uganda (Baby 4) focuses on intensive aquaculture production and marketing. The contract farming and PPP component is the same as for the other

projects: assisting young farmers with inputs such as feed, seeds and fertilizers, and creating market linkages with partners. The status report indicates that contracts have been signed.

As of September 2017, there were 490 young people (of which 35 percent were female) employed either as staff on the aquaculture facilities or as owners of cages/ponds. In the cage culture, there are 7 groups with a total of 47 cages (for tilapia), with two of the groups providing fish to children and orphans. There are four youth groups, which are contracted by farmers to build ponds and supervised by government officials, and ten young people who have been trained to build cages. Small-scale feed production has been promoted and new technologies to improve the quantity and quality of fish and fingerlings have been adopted. Among the challenges in the Uganda there is a reluctance on the part of companies to enter into CF arrangements because they are unable to guarantee purchases of the output. This reluctance is caused by market fluctuations, and the low quantity of produce supplied by farmers. Buyers such as hotels are only willing to sign contracts with farms that can produce large quantities reliably. Unfortunately, most farmers cannot satisfy this requirement and are therefore unable to obtain contracts. The farmers' production is hindered by a lack of inputs as well as the low institutional and financial capacity of cooperatives. Other challenges result from theft and vandalism at facilities, the low level of commitment of some local officials and inadequate business education of some partners.

1.2 CONTRACT FARMING

There are many definitions of contract farming (CF), but in general terms CF is a form of vertical integration between producers and downstream actors further down the value chain, such as agribusiness, processors, exporters or retailers (Santos, 2012). The concept of contract farming (CF) is not new – and was applied in the 1940s in some African countries – but it has been revitalized recently as a consequence of structural adjustment programmes and liberalization of economies. Prior to the 1980s, CF schemes in Africa were often with state-sponsored buyers for bulk export products such as tea, sugar, tobacco and groundnuts. However, structural adjustment programmes have reduced the role of many public agencies. This has enhanced the role of the private sector, which has become responsible *de facto* for enforcing food safety and traceability conditions imposed by importing countries. State enterprises have continued in some countries – as in the case of Mozambique with tobacco – but one alternative is a public–private partnership (PPP), in which a private company (perhaps foreign) partners with another agency (perhaps the government, a donor or NGO) to lead the value chain. Private companies may provide marketing knowledge, technical expertise or capital that the public sector agency lacks. Unlike contract farming, PPPs are not limited to the primary sector but can be involved in transport infrastructure, health or other government services. However, in agricultural activities PPPs and CF can be interchangeable.

There are no reliable statistics on the extent of CF, but it is widespread. In 2009, the United Nations Conference on Trade and Development (UNCTAD) estimated that CF existed in more than 110 countries, both developed and developing, and involving numerous commodities (UNCTAD, 2009). In the United States of America, one-third of the crops and livestock are produced under contract, ranging from 21 percent for cattle to almost 90 percent for poultry (Bellemare, 2012). In Brazil, about 75 percent of poultry is sourced through CF, and 100 percent of cotton in Mozambique and Zambia (UNCTAD, 2009). Cotton in Mali, Côte d'Ivoire, Burkina Faso, and to a lesser extent Zimbabwe, is also produced predominantly through smallholder CF schemes. In Kenya, 60 percent of tea and sugar, and nearly all cut flower exports come from CF schemes (Oya, 2012).

The African country that has the most experience with CF is Kenya. Dating back to the 1940s, numerous CF schemes have collapsed and new schemes appeared. One of the largest and most successful is the Kenya Tea Development Agency (KTDA). A former state enterprise, which was privatized in 2000, KTDA now accounts for about 60 percent of Kenya's tea production. Each of the 560 000 contract tea growers has an average farm area growing tea of less than 0.5 hectares (Braga, Ionescu-Somers and Seifert, 2011). The predominance of smallholders, which account for half of Kenyan tea output, contrasts with Tanzania, where smallholders account for only about 10 percent of tea output (Oya, 2012). In Kenya, half of its horticulture production comes from 150 000 smallholders on CF schemes (Minot and Ngigi, 2004), about 1.5 million people work in the industry (Salami, Kamara and Brixiora, 2010), and overall approximately 25 percent of Kenyan farmers produce under contract, in large part due to CF schemes for tea and vegetables (Glover and Kusterer, 1990).

However, the extent of farmer involvement in CF should not be overstated because Kenya is an exception. The proportion involved in CF in Kenya far exceeds that of other African countries. On average, the proportion of farmers engaged in CF in Africa is between 1 and 5 percent, with Uganda at about 5 percent (Minot and Sawyer, 2016). In Mozambique, while about 400 000 smallholders are involved in some form of CF, this is about 10 percent of all listed smallholder farmers in the country. Only 2.4 percent of the total area farmed in the country is devoted to cotton and tobacco, the two chief CF crops (Oya, 2012). Even in Kenya, large-scale estate farming is reducing the role of smallholders. With fresh fruits, mainly pineapple (which represent around 5–10 percent of total horticultural exports), large-scale estate farming dominates. An example of this phenomenon is the decision by Del Monte to rely entirely on its own estate for the production of pineapples for export, because of CF problems with quality and supply dependability (Minot and Ngigi, 2004). The same is true of floriculture – which accounts for more than half of all Kenyan horticultural exports – and with horticulture in Senegal, where smallholder CF schemes are mainly concentrated on French beans, and the share of smallholder farms is falling (Maertens and Swinnen, 2009). This reported decline of smallholders is due to the growing importance of contracts with large retailers/supermarkets, and associated food safety and 'traceability' requirements (Oya, 2012). More stringent quality standards also make smallholders more risky in terms of timely supply, and the cost of wastage if standards are not met. However, there are examples to the contrary. In the tea sector of Sri Lanka, government policies have reduced transaction costs associated with smallholder contracts and companies are adopting CF with smallholders rather than plantations (Herath and Weersink, 2009). Similarly, in Mexico, smallholders are increasingly producing tomatoes for export, because processors found it difficult to enforce contracts with farmers on large farms (Minot, 2010).

1.3 TYPES OF CF

CF covers a diversity of contractual arrangements ranging from minimal intervention by the buyer, perhaps with some credit but little involvement in the production process, to quasi-plantation schemes where CF farmers must produce under strict conditions (Oya, 2012). Similarly, contracts range from purely oral agreements to fully signed and notarized documents. Among the factors that determine the desirability of the scheme employed, and the formality of the contract, are the existence of potential economies of scale in production and in processing, the importance of credence attributes, perishability, value to weight ratio and transport logistics.

The key factors that encourage or impede contract farming are:

- critical factors
- the encouragement of CF
- the impeding of CF
- technical factors

- high value-weight ratio
- labour intensity
- high output-land ratio
- crops with long gestation
- high asset specificity
- a land-intensive
- pricing
- alternative farm income
- monopsony
- flexible price formulae
- warehouse payment system
- low income elasticity (staples)
- large number of buyers
- forward prices < spot prices
- price volatility
- property rights
- suitable crop for collateral
- stable land tenure system
- availability of rental land
- uncertainty of property rights
- no rule of law
- lack of contract enforcement
- management
- effective farmer participation
- good governance/transparency
- good communication
- farmer organizations effective
- asymmetry of information
- corruption
- services
- efficient/effective extension
- availability and affordability of inputs
- extension has high transaction costs
- poor infrastructure
- organization
- strong growers' organization
- conflict resolution mechanisms
- profitability is not a priority
- contracts are not in vernacular
- no local staff
- finance
- loans/credit advances possible
- availability of guaranteed loans
- collateral other than land ownership
- crop/weather/*force majeure* insurance
- group, rather than individual, responsibility for loans
- high sector-specific investment
- no credit available
- moral hazard
- opportunistic farmers
- no awareness of impacts of side selling
- marketing
- reliable deliveries

- safety nets
- favouritism towards certain farmers
- corrupt officials
- livelihoods
- positive spillover impacts
- access to family labour
- entrepreneurial attitudes
- high dependency
- priority is rural development
- lack of trust.

Source: Adapted from Karaan, 2002

There are two principal types of contracting that may be separate or can be combined: pre-planting and post-harvest contracts. *Pre-planting contracts* refer to annual contracts that specify inputs (often supplied on credit) and technical assistance to be delivered by buyers. However, they may be minimal – as in the case of “resource-providing contracts” that are limited to providing inputs on credit – or they may also specify details of husbandry techniques and how the inputs are to be used. These “production-management contracts” are important for produce that has credence attributes, such as organic horticulture (Minot and Sawyer, 2016).

In addition to pre-planting contracts, some CF schemes include *post-harvest agreements* that guarantee a market (and a price) if produce conforms to standards. Such market-specifying contracts describe the terms of the sales transaction with regard to price, quantity, timing and product qualities (Minot and Sawyer, 2016). The fact that the produce has a market at a known price is an incentive for farmers because it reduces risks. However, advance pricing can create opportunistic behaviour: if the forward price is below the spot price and there are several potential buyers, farmers have an incentive to side-sell; alternatively, if the forward price is below the spot price, the processor may manipulate quality standards in order to reject the produce from contracted farmers. Such behaviour undermines trust, which is an essential prerequisite for sustainable CF schemes, given the difficulty of enforcing contracts through the courts. The business models conforming to the degree of vertical integration required in contract farming are:

- **Degree of Vertical Integration in contract farming**
- Open market
- Purchase agreement
- Management contracts
- Fully integrated nucleus; land and production plus contracted farmers.

Source: Adapted from Vermuelen and Colula (2010)

As mentioned above, pre-planting contracts range from informal schemes in which there are few obligations on farmers or buyers, to the more centralized nucleus estate model. In Zambia, for example, horizontal and vertical linkages within the tobacco and cotton value chains are far weaker than those in the sugar chain (World Bank, 2009). Table 1 indicates the characteristics of some of the CF schemes, although the distinction between them is not clear-cut.

1.3.1 The Informal Model

The informal model is a simple model that may involve a few market agents such as individual entrepreneurs or small companies. It is considered the most transient and speculative of all models, with a risk of default by both the farmer and the processor. Without a written contract, the farmer has no guarantee of quantities purchased or price, and the processor may not have sufficient supply. These risks are indicated in Table 1.

TABLEAU 1
Contract farming models

Contract farming schemes	
Nucleus Estate	
Characteristics	Informal Intermediate Multipartite
Inputs/credit	None Rarely Rarely Sometimes
Extension	None Sometimes Sometimes Sometimes
Farmer groups	None Sometimes Sometimes Sometimes
Centralization	
Production	None None Sometimes Always
Processing	Sometimes Often Often Always
Production control	None Rarely Always Often
Post-harvest	Sometimes Rarely Often Always
Impacts	
Flexibility	Complete Some Little None
Cost	Little Very low High Very High
Quality control	Little Some Some Complete
Risks	
To farmers	Price/quantity Little risk Quality risk Quality risk
To buyers	Uncertain supply Low Consistent supply
Certain supply	
Supply chain control	None Little Some Complete

Source: Adapted from GIZ (2013)

The informal model involves pre-planting contracts, usually on a seasonal basis, between farmers and individual entrepreneurs; it is often used for crops such as fresh vegetables or tropical fruits that are perishable but require only a minimal amount of processing (Delforge, 2007). There may be limited emphasis on quality control. An example is the informal model used in the Northern provinces of Thailand, where farmers grow chrysanthemums and fresh vegetables for the Chiang Mai and Bangkok markets under verbal agreements with individual traders (Delforge, 2007).

1.3.2 The Intermediary Model

The Intermediary Model has greater supply chain control than the informal model and may involve the supply of inputs and technical assistance by a processor. As with the informal model, the processor subcontracts an intermediary (collector, aggregator or farmer organization), who formally or informally contracts farmers. An example is the CF coffee scheme in Eastern Uganda, where 3 500 smallholders are guaranteed a market if their coffee meets the required standard – but with no obligation to sell to the company (Hansen and Rosenthal, 2014). The farmers' only obligation is to follow acceptable farming practices, particularly drying coffee above ground. There is no fee to register but the company is contractually bound to provide inputs and technical assistance. Normally, intermediaries organize everything on behalf of the final buyer, starting with input supply, extension service, payment of the farmers and final product transport. The model is efficient when a large number of outgrowers are involved. This is because handling several thousands of outgrowers involves significant management effort and it might therefore be economically attractive for a processor to outsource this task to an intermediary.

The intermediary model is common in Southeast Asia. In Northern Thailand, two processors directly contract out to middlemen who organize over 30 000 farmers to grow soybeans, green beans and baby corn, primarily for the Japanese market (Delforge, 2007).

1.3.3 The Multipartite Model

The Multipartite Model usually follows the privatization of a parastatal entity, and can include the organization of farmers into cooperatives or the involvement of a financial institution (FAO, 2001). It often involves various organizations such as governmental statutory bodies alongside private companies and financial institutions.

If centralized, there is considerable control over the value chain from pre-planting to harvesting, as indicated in Table 1. It is vertically coordinated with the allocation of quotas and tight quality control. A production-management contract could cover quality standards, production quotas, cultivation practices, crop delivery arrangements, pricing, payment procedures and insurance (Eaton and Shepherd, 2001).

Centralized schemes are important for produce that has credence attributes (Minot and Sawyer, 2016). Tree crops such as coffee, tea, cocoa and rubber, and annual crops, poultry, pork and dairy products all often make use of centralized models – as do crops which require a high degree of processing (e.g. tea, tobacco, cotton, sugar cane, bananas or vegetables). They are economically attractive because of high fixed processing costs and large economies of scale as a result. Smallholders farming crops that are labour-intensive have high output-to-land ratios and are competitive during the cultivation stage, but cannot individually supply enough produce for processing. However, thanks to CF schemes they can provide a large enough output to lower average processing costs. An example of a multipartite scheme is the Mumias sugar scheme in Kenya in the case study below (Box 1).

BOX 1

Case study: Centralized/Multipartite project to cultivate sugar cane in Kenya

The Mumias Sugar Company (MSC) was established through a multipartite agreement between the Commonwealth Development Corporation and the Kenyan Government. It has the largest sugarcane factory in Kenya, and a 4 000-hectare nucleus estate, which provides about 10 percent of the milling needs. Sugar cane processing is capital-intensive with significant economies of scale. Transport costs for sugar cane are also very high. These transport costs, combined with economies of scale in processing, give the factory substantial market power as a cane buyer. To supplement production, it has about 70 000 outgrower farmers. Most farmers are smallholders with plot sizes in sugar less than one hectare, and for food security purposes, it is recommended that they devote only one-third of their farm to sugar, leaving the rest for the cultivation of food crops. Most farmers live in the area, but about 15–20 percent of the contracting farmers in the scheme are “telephone farmers”, who hire labour to produce the sugar cane. Sugar cane in that region requires a growing cycle of 18 months.

MSC provides smallholders with several inputs on credit, such as land preparation, seed, fertilizer, harvesting and transportation of the harvested cane to the mill. Input charges (plus interest) are subtracted from farmer payments. The company is concerned about farmers exerting low level of effort and engaging in input diversion (e.g., use of fertilizer on crops other than sugarcane or reselling). Some farmers complain about poor performance of company staff and contractors and about the delays in input provision and payments. Use of mobile phones informing MSC of deliveries has apparently reduced delays by 16 percent.

Source: Casaburi, Kremer and Mullainathan (2016)

1.3.4 The Nucleus Estate Model

The Nucleus Estate Model is the most centralized of the CF schemes and is viable when there are economies of scale: not only in processing, but also in cultivation. Family farms may not be as efficient at growing certain crops as a large estate. This model may also be used when a minimum output is required for processing to be efficient, in which case output from the estate complements output from contracted farmers. If there is a risk of unreliable supply from farmers, either in quantity or quality, the processor has a certain output from the estate. The processor can satisfy all the conditions for export, such as food safety, traceability, working conditions of labour and environmental sustainability that would need expensive monitoring and enforcement on contracted farms. The nucleus estate model is prevalent with sugarcane, tea and some horticultural produce.

There is an economic disadvantage to the model because the processor must purchase land or, at least, pay for a lease; this cost is not incurred when the processor relies exclusively on contracted farmers. There may also be a political disadvantage, as large plantations may not be ideologically popular with governments. In addition, while the high productivity of labour on estates may maximize labour incomes when compared with family farms, for countries suffering from land shortages the model has a cost in depriving families of potential livelihoods.

In the case study below, the Ugandan government acquired land that was used both for an estate and for contract farming. It had a number of objectives in promoting the Oil Palm Uganda Limited (OPUL) oil palm scheme, with which it wished to produce domestic vegetable oils as an alternative to imports. The initiative also wished to assist with the development of a deprived region of the country. A further interesting policy was the deliberate establishment of a growers' association as an intermediary between the farmers and the processor.

BOX 2

Case study: Nucleus estate project to cultivate oil palms in Uganda

The PPP established a fully integrated oil palm value chain, with forward and backward linkages from inputs (including finance) and production, to marketing and processing, in a relatively poor part of Uganda. It was based on a tripartite agreement between the Ugandan government, Oil Palm Uganda Limited (OPUL) and the Kalangala Oil Palm Growers Trust (KOPGT). OPUL is a subsidiary of Bidco, and its aim was to implement palm oil cultivation and processing. The project included not only the construction of a crude oil palm mill but the establishment of a nucleus estate of 6 225 ha and smallholder farms covering 3 864 ha. The number of smallholders is 1 610 (35 percent women). Some are “outgrowers”, who have a contract with KOPGT under which they pledge their land for 25 years and receive a full range of services from OPUL for the first three years; other smallholders grow and manage oil palm on their own land, supported by inputs and other services provided by OPUL, and financed by loans administered by KOPGT. In addition to smallholders, the PPP has created around 3 000 jobs at the nucleus estate, palm oil mill and refinery.

The Government provided tax and other incentives to Bidco and purchased land for oil palm production, leasing the land to Bidco for 99 years. A distinctive feature of this PPP is the growers’ association (KOPGT) that was established by the government. KOPGT acts as the intermediary between farmers and OPUL so farmers have no direct link with the processor. KOPGT also owns 10 percent of the shares in OPUL, the remainder being owned by Bidco. KOPGT manages the production of farmers; it registers and surveys the land, sources and provides inputs and services usually on credit, manages loans and their repayment, organizes crop payments to farmers net of credit costs, and generally represents farmers’ interests. It should be noted that in 2007 some farmers felt dissatisfied with KOPGT and established a separate growers’ association. Overall, the PPP has been a success based on interviews, with higher incomes and increased food security.

Source: IFAD/IDS (2015).

1.4 ADVANTAGES AND DISADVANTAGES FOR FARMERS AND PROCESSORS

To engage farmers and to keep them committed, CF must be of benefit to them. They will farm under contract only if the expected gains exceed a certain utility threshold, which is the opportunity cost (Barrett *et al.*, 2017). Potential expected benefits include the reduced risks through a guaranteed market and price. Credence factors, such as quality and transparency, are increasingly important in selling to chain stores, whether global or national, with the private sector imposing rigorous demands. Contracting can ensure the farmer a market if produce standards are met. Access to a guaranteed market is critical for perishable produce; in sub-Saharan Africa storage is so inadequate that wastage exceeds 40 percent and even 70 percent for some fruit and vegetables (Salami, Kamara and Brixiora, 2010). In addition to providing a market, contracting can reduce price risk, if farmers can rely on a guaranteed price at harvest, rather than the spot price. This risk management is a fundamental motivation for those farmers whose crops face volatile prices (Masakure and Henson, 2005). In addition, contracting offers the potential for increasing net farm income, though higher productivity and occasional price premiums.

A major incentive for farmers to join CF schemes – potentially the most significant, particularly for smallholders – is access to credit (Glover, 1987). Contracting may be the only route for farmers to produce non-traditional crops because their cultivation is much more expensive per hectare than traditional crops: in Mexico, for example, cultivating strawberries is ten times more expensive than corn (Key and Runsted, 1999).

If capital is not accessible through microfinance institutions or traditional financial service providers, value-chain finance may be the only source.

Contracting with a reputable agribusiness (such as through a PPP) allows farmers access to finance in a number of ways. The most common is for agribusiness to advance credit to finance production inputs and/or investment. Contracts with smallholders usually include forward payments or the provision of inputs to help overcome the problem of financial constraints faced by farmers (UNCTAD, 2009). Agribusiness firms have an advantage over banks as lenders in such circumstances because of their ability to monitor and enforce credit contracts. They may also have lower default rates than banks themselves (Key and Runsted, 1999).

Another way that CF assists with credit is when financial institutions accept contracts as collateral for a loan directly to the farmer. In certain cases, as in the case of a major investment, the agribusiness may guarantee the contract, thereby acting as an intermediary between financial institutions and farmers.

Furthermore, evidence indicates that farmers benefit financially from CF. Contract farmers have significantly higher incomes than other farmers, ranging from 10 percent to as much as 100 percent higher in certain countries (UNCTAD, 2009). Higher incomes reduce the risk of insolvency and credit default, thereby enabling such farmers to obtain credit directly from financial institutions. It should be noted that agribusinesses could jeopardize farmers' ability to repay loans, and it is common for companies such as supermarkets to delay payments to farmers; for example, in Latin America, horticultural producers face payment delays of 15 to 90 days (UNCTAD, 2009).

An indirect means of enhancing credit for smallholders is the warehouse receipt system (WRS), as that active Ghana through the Grains Council (IFAD/IDS, 2015). The Council has established warehousing for grain with standards and transparent regulations. Not only has this provided much-needed storage facilities, thus giving an alternative to farmers who would otherwise have to sell regardless of market conditions, but by issuing receipts it eases access to credit. The electronic receipt specifies the quantity and quality of a particular grain. The receipts are accepted as collateral by banks, which facilitates farmers' access to credit.

The acquisition of knowledge is also linked to technical assistance. Learning effects and enhanced human capital can produce dynamic impacts over the long term, notably by encouraging farmers to initiate their own projects. This was the case in certain Indonesian villages, where contracting enabled input and credit markets to develop, and stimulated entrepreneurial farmers to cultivate oil palms independently of any processor (Gatto *et al.*, 2017). Intangible benefits, such as prestige within the community, may also influence farmers to contract.

TABLE 2.
Potential trade-offs for farmers in contract farming

Potential advantages for farmers	
Potential disadvantages for farmers	
Reduced risk: Increased risk:	Guaranteed pricing structures Production risk if a new crop/poor technology Access to reliable markets Manipulation of quality specifications
Higher income: Lower income:	Access to credit Indebtedness and over-reliance on advances. Provided (subsidized) inputs/services Corruption of company staff Guaranteed price > open market price Guaranteed price < open market price
Positive Externalities: Negative externalities:	Capacity building Intra-household friction Introduced to new technology Domination by monopolies/monopsonies Prestige in the community Increased food insecurity Spillover impacts on community Loss of land tenure Stimulating entrepreneurial attitudes Cumulative adverse environmental impact

Source: Adapted from FAO (2001)

For agribusinesses the choice to contract is primarily economic, although political expediency may also be important. Agribusinesses in a global market are price-takers whose goal is to make at least zero economic profit. As buyers with a derived demand, they will seek to minimize procurement costs from the lowest cost suppliers, subject to quantity and quality considerations (Briones, 2015). An additional stipulation is that growers abide by the terms of the contract (Key and Runsted, 1999). Input prices would equal marginal revenue production. One strategy for the agribusiness is to acquire inputs in the spot market. However, with open market purchasing, there is uncertainty due to insufficient quantity at regular intervals, and absence of credence (quality) attributes. Another strategy is to establish a plantation to ensure adequate quantities of a crop of acceptable quality. However, such complete vertical integration may not be economically viable if there are few economies of scale in production, and reliance on family farms for supplies can be cheaper. Transaction costs for organizing (family) labour are low on smallholdings compared with the cost of monitoring hired labour on plantations. They are, therefore low-cost producers of labour-intensive crops (such as horticultural crops) and their output-to-land ratios are also higher. The result is that family farms can be competitive producers of crops for export (Briones, 2015). In addition, CF may be a political strategy if plantations are unpopular ideologically. Rather than accept plantations, some governments in Africa have acquired land for agribusinesses willing to contract, and then leased it. Contracting may also enable the agribusiness to access subsidized credit from donors (Oya, 2012). The adoption of contract farming therefore hinges on both economic and political factors. Given the weaknesses of spot purchasing and plantations CF can be a compromise strategy. The agribusiness does not need to own land or supervise workers, but can ensure it receives a predictable supply of quality products.

TABLE 3.
Potential trade-offs for processors in contract farming

	Potential advantages for processors	Potential disadvantages for processors
Reduced risk: Increased risk:		Production reliability and shared risk; Farmer discontent Quality consistency and reliability Guaranteed price may be too high
Higher profits: Lower profits:		Lower produce costs from smallholders Side selling by farmers No expense needed to acquire land Input diversion by farmers
Positive externalities: Negative externalities:		Political acceptability of CF Adverse environmental/social impacts

Source: Adapted from FAO (2001)

There are forces that encourage vertical integration in agriculture and the establishment of CF schemes. One major factor is the existence of economies of scale in *processing*. An agriprocessor that has heavy fixed costs requires a high volume of produce of consistent quality and at regular intervals to amortize costs, and this is all the more acute if the produce is perishable. If there were no economies of scale the processor could buy spot because irregular supplies need not affect average costs. At the other extreme, if there are economies of scale in production as well as processing, the processor will be tempted to vertically integrate as a nucleus estate or plantation, and perhaps rely only on CF as a supplementary source of input, or for political expediency.

In addition to economies of scale in processing, the increasing reach of supermarkets prompts vertical integration. Global and national supermarkets are increasingly stringent in their demands for food quality, food safety and transparency. Market imperfections such as transaction costs and asymmetrical information prevent individual farmers from linking with those markets and meeting their standards. These buyer-driven food stores with their credence requirements oblige farmers to join vertically integrated agricultural chains. Through CF, farmers can mitigate risk by ensuring there is a market for their produce (and often at a prearranged price). A further impetus towards CF is a desire among certain consumers for “ethical” produce. To demonstrate commitment to fair trade, for example, it may be politically strategic for supermarkets to co-opt smallholders in CF schemes (Oya, 2012).

In summary, the crop influences the attractiveness of CF for agribusiness. Most CF projects involve high value products such as fruit, vegetables and livestock, or industrial commodities such as palm oil, coffee or tea destined for export. Their marketing is uncertain because of food safety risks or credence demands, and cultivation is specialized (Maertens and Velde, 2017). Many are highly perishable and have high storage and transport costs. An agribusiness can offer marketing (and production) contracts, thereby reducing transaction costs for farmers in the food supply chain. For example, most organic exports from Africa come from contracted smallholders (Jones and Gibbon, 2011).

TABLE 4.
Crops ranked according to their suitability for contract farming

Rank ¹	Crops	Characteristics
1	Aquaculture and poultry/livestock	Perishable, technical expertise needed, food safety controls needed, high fixed costs in processing.
2	Cash crops (cotton, tobacco, etc.)	Weight-losing, high processing costs, few alternative buyers.
3	Horticulture (beans, tomatoes, etc.)	Perishable, labour-intensive, technical expertise needed, strict controls needed for food safety.
4	Tree crops (coffee, tea, etc.)	Perishable, controls needed for marketing, high fixed costs in processing.
5	Staples (rice, wheat, etc.)	High risk of side selling with many buyers, not skill intensive, low value to weight ratio.

¹ Where number 1 is the most suitable; number 5 the least suitable

Source: Adapted from TechnoServe and IFAD (2011); GIZ (2013)

Commodities in CF schemes tend to be labour-intensive, perishable, with complex input requirements, a high value-to-weight ratio and economies of scale in processing/marketing but not production (Minot and Sawyer, 2016). The most common commodities under contract in tropical countries are tobacco (which is labour-intensive and requires careful husbandry), sugarcane (which is highly perishable and which has large economies of scale in processing), cotton (which is often managed by state enterprises or private monopolies in Africa thereby ensuring enforcement of contracts), tea (which is perishable), seed, grain for breweries, poultry, dairy, oil palm and rubber (Minot, 2010). Production contracts for poultry are common in both developed and developing countries.

Transaction costs in production and processing are particularly high for aquaculture and poultry in sub-Saharan Africa (Delgado, 1999). Hence, fish and fingerlings as well as chicks are ideally produced on farms with rapid access to processing or retailers. Producing them is labour-intensive, with high returns to technical expertise and extension. Complex inputs are required, as is investment. With processing and marketing, perishability requires rapid transport, facilitated by the product's high value-to-weight ratio. Quality standards and credence attributes also favour close links to agriprocessors, which have the capital and knowledge to market domestically or abroad.

The case study below (Box 3) of mussel cultivation in South Africa indicates the attributes that impose vertical integration (Karaan, 2002). These factors are not unique to mussels, but are even more pronounced for finfish destined for export, as illustrated with catfish from Viet Nam and salmon from Norway. With aquaculture, either CF or even more concentrated value chains are desirable.

In South Africa mussels are grown on ropes suspended from rafts, with a gestation period of 18 months. Rafts have few other uses, and are specific to the industry. This hinders exit strategies. Investment costs are not high because the need for land is minimal but access to the rafts requires a boat. Processors have access to information about techniques that is not as readily available to small-scale farmers. In the production stage, a major advantage of small-scale farms is the labour component. As with horticulture, family labour requires little monitoring because of shirking, giving family operations a competitive advantage in production compared with estates. There are few economies of scale in production. The handicap for small-scale farmers is a potential shortage of cash flow due to the length of time before harvesting. In processing, with its high fixed costs, the advantage is with processors and contract farmers, who can also benefit from credence factors such as quality, food safety and traceability. The final category of the environment is mixed. Independent farms and contract farms have more political acceptability in South Africa than large operations. The smaller farms also tend to create more employment per unit of output, reinforcing political support. On the other hand, estates have greater access to commercial finance and can

BOX 3

Case study: Transaction costs and mussel cultivation in South Africa

South Africa is a net importer of mussels and oysters, in spite of favourable coastal conditions. Over the last decade domestic output of both has stagnated if not fallen, and the number of farms has declined. To see which farming model is best suited in South Africa given the transaction constraints on mussel cultivation, a summary is given below where positive signs indicate the preferred model.

Transaction Costs	Independent farmers	Contracted farmers	Processor/Estate
Pre-production			
Asset specificity	-	+	++
High Investments needed	-	-	+
Information asymmetry	-	+	+
Production			
Diseconomies of scale	+	+	-
Returns to research	-	+	+
Labour intensity	++	++	-
Perishability	-	+	+
Cash needs	-	-	+
Processing/marketing			
Economies of scale	-	+	++
Information asymmetry	-	+	++
Credence factors	-	+	+
Environment			
Political support	++	++	-
Lease scarcity	+	+	-
Financial support	-	+	++
Input supply	-	+	+

Source: Karaan (2002).

source inputs more effectively and efficiently. Overall, contract farming appears to be the optimum although it presupposes financial and technical collaboration with the processor, as in a production management contract.

However, food safety standards and credence factors are encouraging vertical integration for fish destined for exports; moving away, in other words, from independent farmers towards contracted farmers and estates. In the two case studies below, the value chain is moving to the right in Table 1, even to nucleus estates with catfish farming. Both catfish from Viet Nam and farmed salmon from Norway are primarily exported. The vertical integration is reinforced when processing has high fixed costs and consequent economies of scale: here the minimum efficient output for processors increases, obliging them to ensure a reliable and constant supply of inputs.

Staple products, on the other hand, are less suitable for CF, in spite of their potential societal benefits. While their expansion is more effective in reducing poverty than the export-led growth of agricultural products, because of their greater growth linkages, staples lack many of the attributes for vertical integration (Diao, Hazell and Thurlow, 2010). Compared with other crops in Table 3, staples are less perishable and more easily stored. They can be cultivated without technical innovation and economies of scale. A further handicap to using CF is contract enforcement: there are many small buyers, which creates opportunities for side selling by farmers; what is more, being of low value staples are not amenable to price premiums. Income inelasticity could also be an issue for sustainability in the long run.

BOX 4

Case study: Aquaculture's evolution towards vertical integration: catfish in Viet Nam

The case study is freshwater *Pangasius* (*Pangasianodon hypophthalmus*) cultivated in Viet Nam. From almost zero output twenty years ago production reached 1.2 million tonnes in 2015, worth more than USD 2 billion. However, expansion has not been smooth. Tariffs were imposed by the United States of America and concerns expressed in Europe about the excessive amounts of antibiotics used. The financial crisis further challenged the industry. Volatile prices and fluctuating demand have forced around 50 percent of producers to leave the industry, with some having sold or leased their land to processors.

A particular characteristic of *Pangasius* is its export orientation: most of it is exported (to more than 100 countries). This focus on exports and the (uneven) expansion of the industry has affected the value chain and the role of farmers. The emphasis on exports makes the survival of an independent, small-scale farm hazardous; credence and food safety standards with their high transaction costs undermine the competitiveness of independent farmers. Most farms are less than 5 hectares, and they are largely owned and managed by farmers themselves. Even with low densities, a *Pangasius* pond can harvest between 100 to 200 tonnes per cycle. This means that small-scale *Pangasius* farms are vulnerable. The small amount of land required enables processors to acquire land close to the processing plant, replacing independent farms, and create an estate. Alternatively, processing plants can buy the ponds from the grow-out farmers. The displaced farmers then become employees of the processor on its estate. Another possibility is for the grow-out farmers to enter into contract with the processing company.

To verify quality and food safety standards, inspection has increasingly passed to the private sector. For exports, Global GAP and BAP are dominant standards for *Pangasius* quality and safety, although some retailers have their own standards, which they monitor and enforce during production and processing. Once foreign buyers indicate the amount they require, processors meet the order from their own estate or from contracted farmers. There is also the possibility for independent farmers to try to sell directly to the processor. The ability to buy from contracted farmers or from independent farmers provides the processors flexibility with quantities, quality and prices. The advantage to the processor of estate output is that production is controlled, whereas neither contracted nor independent farmers are obligated to meet standards. Fish from the contracted and independent producers must therefore be inspected at the farm for safety and quality. The quality inspections at the farms consist of size and flesh colour, while the safety inspections include tests for the presence of antibiotic residues and fish diseases (Hansen and Trifkovic, 2014). If satisfactory, the processor purchases the fish at a price determined by quality. The fish is further tested, once at the processing plant and again, before they are exported.

Foreign retailers may also monitor upstream processes. To reassure their customers they may monitor compliance with environmental and work safety regulations during production, as well as social licence. On-farm requirements include a minimum space (about 20 percent of the production area) for sludge prior to discharging effluents, approved medicines and improved quality of fingerlings, training and traceability, which requires the documentation of inputs. Capital investment and ongoing costs such as record-keeping are borne by farmers; the processors do not provide credit or loans. Farmers who cannot borrow commercially are effectively sidelined from exporting because of the financial implications and they may therefore produce for the domestic market where standards are considered less demanding. The impact of standards on incomes are mixed. Compliance requires heavy investment, which penalizes the poorer

farmers; on the other hand, standards can boost average incomes because they give access to foreign markets. Econometric conclusions on the impact of Pangasius standards are equally mixed. As indicated in studies in agriculture, the main beneficiaries of standards are middle-income farmers. They have the resources to comply with on-farm regulations, incur the opportunity cost of training and adopt technology to improve competitiveness. Farm size, ownership of assets, information access and external assistance are critical, and farmers without these attributes become marginalized. The extent of the financial gain for the wealthier farmers of Pangasius is unclear, but studies of agricultural crops have shown significant impacts. Kenyan farmers have been shown to increase their net revenue by about 60 percent after adopting EurepGAP standards (Hansen and Trifkovic, 2014). A further econometric study of Pangasius producers compared the revenue impact (as indicated by consumption) of three categories: contracted farmers, independent farmers and estate workers (Trifkovic, 2014). Contracted farmers fared the best because they could meet standards enabling them to sell to processors, but landless estate workers also prospered, and fared as well as the independent farmers.

Source: DERC/CIEM (2010); Hansen and Trifkovic (2014); Trifkovic (2014).

However, a recent case study in Benin has illustrated how CF can be successful in producing one staple: rice (Maertens and Velde, 2017). Benin has used CF to expand domestic production of rice as an import substitution strategy. Not only has production increased, but farmers under contract have also enjoyed higher net farm incomes (of 17 percent). There has been little side selling, in part because of the design of the CF business model, which envisages that contracted farmers can become co-owners of the agribusiness. As a staple, rice can be a drain on foreign exchange reserves, but other countries and provinces have successfully used CF to cultivate the crop: Taiwan Province of China, and Thailand are a case in point, expanding their rice cultivation by using a successful interplay between the government and private sectors (Denziger, 1996). In Nigeria, PPPs have also successfully promoted domestic rice cultivation, as demonstrated in the case study (UNCTAD, 2009).

1.5 IMPACTS OF CF

Evidence of the benefits of CF on agriculture is generally positive, if somewhat ambivalent. Some studies have criticized CF as exploitive and detrimental to smallholders (Little and Watts, 1994; Oya, 2012). A number of factors can threaten smallholders involved in CF, such as asymmetrical information, potentially duplicitous behaviour by buyers in assessing the quality of produce and monopsony pricing. In general, multinationals prefer to contract with larger farms because transaction costs are lower. For example the procurement policies of Nestlé are alleged to have forced 60 000 smallholder dairy farmers out of business in Brazil (UNCTAD, 2009). However, the operational scale may not be the only reason: the critical determinant is the cost of procurement in relation to the price of output. If smallholdings have high output-to-land ratios they can be competitive. In Pakistan for instance, in contrast with Brazil, Nestlé sources milk from 135 000 smallholder dairy farmers.

Critics of CF are concerned that the unequal power relations between agribusinesses and farmers inhibit smallholders from negotiating “fair” contracts, a difficulty which is sometimes compounded by an unfamiliarity with the language used in the contracts. There is a danger that smallholders grow increasingly dependent on the agrobusiness, because they have become too specialized and indebted. This imbalance of power may deteriorate further, weakening farmers’ bargaining position until they are reduced to

BOX 5

**Case study: Aquaculture's evolution towards vertical integration:
Norway**

Farmed Atlantic salmon (*salmo salar*) is one of the major success stories in aquaculture. This is particularly the case in Norway, which has succeeded in reconciling the major criteria of sustainability – economic, environmental and social. Atlantic salmon is the second most valuable farmed species after whiteleg shrimp and was worth almost USD 12 billion in 2015. Production worldwide has increased five-fold over the last twenty years, with Norway accounting for about half of total output. As with Chile, the second largest producer of farmed Atlantic salmon, most of Norway's output is exported.

Aquaculture has revolutionised the supply chain in fisheries. Traditionally, capture fisheries provided fish for processing plants, but supply was seasonal and unpredictable. To cope with this volatility, processing plants were labour-intensive because labour could be hired or fired relatively easily. Aquaculture, however, can provide a constant and reliable supply to processing plants. The result has been greater reliance on capital-intensive technology in processes such as sorting, gutting, skinning, bone removal, slicing and portioning. Use of labour saving technology has accelerated with rising wages for work in isolated coastal areas. The high fixed cost of machinery creates a need for reliable supplies for the processing plant to obtain economies of scale. The model is increasingly resembling that of agricultural crops, which require close vertical integration, rather than the traditional processing for the capture fisheries. As with agricultural processing, efficiency is maximized when the product has a uniform size. In this integration, the largest companies own hatcheries and fish processing plants, and have long-term contractual relationships with processors or supermarket chains. This vertical integration coincides with increased outsourcing of many specialized services such as live seed transport and net cleaning.

As the average cost curve becomes steeper due to economies of scale, the cost to processors increases when supplies are unreliable in terms of quality and quantity. Processors are therefore increasingly dependent on those farmers who are reliable suppliers. At the same time, farmers are dependent on processors if they cannot sell their product on the open market. This mutual dependency provides the potential to engage in relational contracts. Such contracts are self-enforcing, and avoid problems of contract enforcement through the courts. Courtroom enforcement becomes problematic for example when an uninitiated third party (e.g. a judge) cannot adjudicate quality. A relational contract tempers the incentives of both farmer and processor to engage in opportunistic behaviour. By integrating into the value chain, the incentive of the farmer to "hold back" deliveries for a renegotiated higher price from the processor is obviated because they are united. Simultaneously, the processor is deterred from opportunistic behaviour by fear that the farmer may find other buyers. The result is that increasing technology in processing is leading to greater vertical integration between farmers and processors

Source: Kvaloy and Tveteras (2008).

the position of *de facto* agricultural employees. There is the further criticism that a reliance on CF and monoculture contributes to household food insecurity if land is no longer available for subsistence farming. Concern about food insecurity has prompted many CF schemes to limit the size of land allocated to cash crops. Intercropping is also possible for many crops. In the study of four cash crops in Zambia – cotton, burley tobacco, sugar and horticulture – there was no trade-off between cash crops and food crops (World Bank, 2009); in fact, fertilizer provided for the cash crop helped the

growth of food crops. Similarly for a CF coffee scheme in Uganda there appears to be no trade-off: evidence suggests that while contracting farmers have not earned higher incomes compared with a control group, they have improved their farming techniques and have not suffered from negative externalities such as an increased risk of food insecurity (Hansen and Rosenthal, 2014). Intercropping with food crops is common in the scheme.

One cause for scepticism about the positive impacts of CF is based on the statistical methods employed in some studies. Some statistical techniques assume random distribution in CF, whereas selection might be non-random. If agriprocessors select only large and innovative CF farms, the selection of farms is not made at random. Studies that showed a positive relationship between smallholders' participation in CF and farm incomes, assuming random selection by agriprocessors, would therefore only indicate correlation and not causality (Briones, 2015). Studies showing a positive relationship between smallholders and incomes can therefore be considered biased as a result.

However, the majority of studies using more sophisticated techniques have confirmed that CF is beneficial for farmers, even for smallholders (Nguyen, Dzator and Nadolny, 2015; Minot and Sawyer, 2016; Briones, 2015). While recognizing the risks to smallholders, they indicate a positive relationship between CF and net farm incomes. Using a Hickman selection model, a study of organic coffee growers in Uganda found that participation in CF increased farmers' incomes by 75 percent (Bolwig, Gibbon and Jones, 2009b). A large part of that increase was due to farmers being able to benefit from a price premium. A randomized trial test in Kenya showed that the potential for higher incomes in vegetable growing encouraged smallholders to switch to CF (Ashraf, Gine and Karland, 2009). Using a willingness-to-pay methodology, it was demonstrated that CF in Madagascar increased incomes by more than 10 percent (Bellemare, 2012). Panel data techniques also suggest that CF has a positive impact. Panel data of smallholder CF farms in Uganda found no statistically significant effect on profits from coffee production, but an improvement in farming methods thanks to the CF scheme. However, other panel data studies have found a direct, positive correlation between CF and smallholder incomes; one study in Nicaragua showed an increase in both incomes and productivity, while another study of palm oil production in Indonesia identified an increase in the incomes not only of contracted farmers but also of households that did not adopt CF (Gatto *et al.*, 2017; Michelson, 2013). The reason was the latter spillover was the infrastructure that developed because of the successful CF. An empirical study of four CF cash crops in Zambia – cotton, burley tobacco, sugar and horticulture – using various techniques, found income gains for smallholders farming all four crops; gains were particularly significant for sugar because of the tight governance of the value chain.

Concerns have also been expressed regarding the absence of any holistic analysis in some econometric studies, and their myopic time-horizon (Kuzilwa *et al.*, 2017). Cultural, environmental, political and social impacts may be ignored to the detriment of full impact analysis. Contracting schemes create externalities and these long-term dynamic impacts are often ignored in narrow econometric studies. In fact, the World Bank study of four CF schemes in Zambia concluded that non-monetary impacts are critical for the successful sustainability of value chains (World Bank, 2009). Negative externalities create trade-offs between higher farm incomes and non-monetary impacts, and the latter may jeopardize the sustainability of CF schemes. One example is the environmental impact of floriculture in Kenya. Intensive horticulture and population growth near Lake Naivasha – where about half of Kenyan floriculture is located – has created such environmental damage that concerns are being raised as to whether the industry there is sustainable (UNCTAD, 2009). Socially, CF can create intra-household friction between household heads and their extended families (Key and Runsted, 1999).

On the other hand, positive externalities will reinforce the benefits of CF: this is what was concluded in Zambia. There, non-monetary benefits were even more important than the income gains to farmers and indeed exceeded monetary benefits (World Bank, 2009). In Indonesia villages that participated in contracting saw increased incomes (Gatto *et al.*, 2017) while inequality between villages has fallen because poorer villages were those most likely to have participated in the CF, and have benefited the most as a consequence. The establishment of linked input industries in the contracting villages, and greater entrepreneurship, were additional externalities. The CF scheme has had a dynamic impact on human capital, with farmers learning to grow oil palm independently of the processor. Similarly, dynamic impacts of CF are evident in Uganda where PPP involvement in coffee, floriculture and fishing has led to the establishment of domestic industries that supply goods or provide support services (UNCTAD, 2009). Agricultural practices may also benefit. In the “Improve” CF coffee scheme in Eastern Uganda the principal benefit to smallholders was learning better farming practices (Hansen and Rosenthal, 2014).

In conclusion, most studies have demonstrated that CF has been a “win–win”, with farmers and processors benefitting, and generally positive externalities. Countries also benefit, as CF provides the inputs to increase agriculture productivity and the crop may relieve foreign exchange constraints. Uganda has adopted CF with private partnerships to begin exporting organic cocoa and coffee, and Rwanda has done the same for tea. Policies of import substitution can also make use of CF. In the case studies, Nigeria has promoted contracting through partnerships with private companies to increase the cultivation of rice, thereby reducing its dependence on imports. Similarly, Taiwan Province of China and Thailand have successfully used PPP to cultivate their principal staple – rice – to reduce imports (Denziger, 1996). In Uganda, the CF scheme to cultivate oil palms is an attempt to provide a source of domestic vegetable oil.

1.6 LESSONS AND BEST PRACTICES

The sustainability of CF schemes in the long run is an issue. Donors, governments or NGOs have funded many CF schemes, which may lack viability when abandoned to market forces. A CF scheme must meet the economic, social and environmental criteria for sustainability. An example is the Mumias Sugar Company, in Kenya, which has been unable to pay its contracted farmers, and in 2017 had to rely on funding from the government to meet its obligations. There are therefore hurdles to overcome in CF schemes achieving sustainability; some of these hurdles include:

1.6.1 Governance

Although not specific to CF, the economic, political and social environment of the country or region is critical to its success. Policy and political stability, the rule of law and transparency are fundamental to providing an attractive environment for investment. Good governance is a necessary (though not sufficient) condition for successful and sustainable entrepreneurial activity and a pre-requisite for sustainable growth. One example is Burundi, where poor governance and political instability have undermined the financial sector, with “insiders” using it to seek rent rather than economic development (Nkurunziza, Ndikumana and Nyamoy, 2012). As a result, medium-sized firms struggle to access finance, with consequently low investment and weak economic growth.

1.6.2 Agribusiness participation

This is perhaps the principal constraint to promoting CF (Briones, 2015). Agribusiness may not find CF compatible with their corporate goals, particularly when partnering with smallholders. This declining interest in CF among private companies in East Africa was noted in the earlier report based on interviews (FAO, 2017, p. 123). Among

the reasons are side-selling, input diversion and unreliable deliveries. Specifically, companies did not want to sign formal contracts. In both Kenya and Uganda buyers did not want to guarantee constant purchases because of uncertain markets, and the small quantities produced by farmers (FAO, 2017, pp. 174–178); there was much less concern with large-scale farms, because of the assurance that produce will be delivered.

1.6.3 Side selling and input diversion

A major, if not the most important, hurdle to the sustainability of CF is side selling. Side selling is significant when spot prices are higher than the guaranteed forward price, and the temptation to sell outside the contract is reinforced when there are many buyers. The prevalence of potential buyers makes CF schemes in staples problematic, and has prompted suggestions that monopsonies are preferable for some CF schemes (Kuzilwa *et al.*, 2017). For farmers, side selling can also be used as a means to avoid repaying the credit previously advanced for inputs. Opportunistic behaviour by farmers can also occur through deliberate delays on deliveries, in order to renegotiate higher prices. These “hold-ups” can be effective if processing has large economies of scale and requires a minimum supply to be efficient. Studies suggest that the risk of a hold-up applies farmed salmon, prompting production and processing vertical integration (Kvaloy and Tveteras, 2008).

For the agribusiness the financial implications of this can be bankrupting: it advances inputs, equipment, services and extension on credit, but the farmer sells produce to another buyer. The agribusiness is left with debt, and also deprived of produce to process. An indication of the financial threat is the need to provide incentives for input recovery. One agriprocessor in Zambia offers distributors almost a quarter of the total value of inputs cost if they get complete recovery of input costs (World Bank, 2009). This financial risk is a significant constraint on agribusinesses engaging in contract farming and side selling has caused a number of CF schemes to collapse. In the Uganda side selling by farmers forced UGACHIC to cease vanilla production (draft FAO, 2017, 36). Similarly, side selling (and side buying) threatens the viability of the entire value chains for cotton and tobacco in Zambia (World Bank, 2009). Contract enforcement through the courts is often lengthy, uncertain and costly, with weak contract enforcement the single most important constraint for all CF and value chains in Zambia (World Bank, 2009).

To reduce side selling there are a number of options governments and companies can pursue. The primary option for governments is to ensure that contract enforcement is effective and efficient. Without clear enforceable contracts, trust and the sustainability of projects are jeopardized. Guidelines are available that provide a framework for contract agreements (FAO, 2012; UNIDROIT, FAO and IFAD, 2015). Without contract enforcement, the only deterrent to side selling is to discontinue the contract.

In order to facilitate enforcement, governments can institute arbitration measures outside the courts. These can be local and more cost-effective: in Malawi, disputes over contracts can be resolved through the Ministry of Labour (FAO, 2017, 232); in India there is a dispute settlement authority.

Another option to reduce side selling is the sharing of information among buyers about farmers and their risk of credit default: in Benin, the government encouraged cotton buyers to communicate information on farmers and their use of subsidized credit (Minot, 2010). This enables companies to blacklist inveterate side sellers. Governments can also provide guidelines on contracts and their preparation, so that all parties are aware of their obligations. Ideally, such information would make opportunistic behaviour taboo. However, in reality smallholders resort to side selling for much needed cash, while agribusinesses, working with many contract farmers, find it financially unfeasible to eliminate side selling. Sanctions are therefore necessary (World Bank, 2009).

In addition to governments, agriprocessors also have a role to play. They must ensure that contracts are informative and understood. Providing contracts written in the vernacular, and giving them to farmers for their records, allows farmers to refer to the contract and thus refute any claims that they did not know what the contract contained (World Bank, 2009). The contract should stipulate the grading parameters and price formula; it should also specify the penalties that farmers engaged in side selling would incur. The prices offered by agriprocessors could also vary: companies could permit farmers to sell a portion of their produce at market prices at peak periods, and acquire the remainder at other periods. Another alternative is to forego any obligation to sell to the company. This is the case of one coffee exporter in Uganda (Hansen and Rosenthal, 2014): the company guarantees to purchase all coffee from contracted farmers if the coffee meets pre-arranged standards, but with no reciprocal obligation. Farmers can sell to the company or to other buyers. The purchase price (announced daily with no price premium for contracted farmers) reflects competitive conditions. Farmers face a price risk compared to a guaranteed forward price, but have no market risk because the company buys all coffee. The company is spared the risk of side selling.

An important step in reducing side selling is the close monitoring of farms. Management information systems can indicate the likelihood of farmers' cheating to agriprocessors, as well as the diversion of inputs to other crops. Some agribusinesses leave the responsibility to groups of farmers, rather than to individuals. This seems to be effective in reducing deliberate credit default because individuals engaged in side selling face peer pressure from other farmers. Co-operatives and farmers' organizations may also play this role as illustrated in case studies in Uganda and in Rwanda.

Table 5 below summarizes some of the measures that could mitigate side selling.

TABLE 5.

Measures to mitigate side selling

Government	<ul style="list-style-type: none"> Improved dispute settlement, perhaps with a designated mediator. Encourage the sharing of information between companies about farmers and their credit history. Provide templates of possible contracts to ensure that contracts are transparent.
Companies	<ul style="list-style-type: none"> Provide clear information in the vernacular about obligations and penalties. Companies could offer flexible marketing contracts, allowing some produce to be sold at the spot price. Companies could adjust the forward price upwards, if justified by market conditions. When inputs are provided on credit, lending to groups of farmers rather than individuals reduces the risk of voluntary default thanks to peer pressure. When inputs are provided on credit, have other farmers act as guarantors. Ensure that everyone knows that side selling jeopardizes the value chain, thereby reinforcing peer pressure against opportunistic farmers. Encourage trust by being transparent and treating farmers fairly. Use co-ops or farmer organizations as intermediaries between farmers and agriprocessors Adopt incentives for input distributors to encourage the full recovery of input costs. Provide split payments to ease pressure on cash-strapped farmers.

1.6.4 Opportunistic processors

There is the danger of opportunistic behaviour by processors or at least the perception of dishonesty. Agriprocessors may manipulate the quality standards of produce when spot prices are below the forward price. The aim of the processor is to avoid paying the (higher) guaranteed price for produce by contracted farmers. Farmers may perceive the staff of processors as being dishonest – not only about how the produce is classified, but also about how it is measured. Inputs provided by the agriprocessor can also be an issue. Agriprocessors may be perceived as overcharging for inputs, providing poor quality inputs or jeopardizing harvests by irregular or late delivery of inputs. Poor quality inputs and unreliable delivery of inputs can handicap farmers producing the

quantity and quality of produce contracted. Another problem is hold-up (Otsuka, Nakano and Takahashi, 2016). A contract may require the farmer to invest in contract-specific assets (e.g. chicken houses), but not all contingencies can be foreseen: if the agriprocessor changes the contract, the farmer is unable to sell the specific asset and recoup the investment.

The solution to the manipulation of produce is to have external agencies (and or farmers) certify standards prior to planting, so quality standards cannot be changed to suit the processor. Using electronic measuring devices provides transparency on quantities. The issue relating to input prices and quality appears widespread – in Thailand there are reports of companies charging farmers higher prices for fish feed, fingerlings and equipment than available in the open market (FAO, 2017, draft 157). To ease concerns, companies must ensure that farmers know the cost of transport, as well as inputs, because transport is an expense that can legitimately be passed on to farmers. Transparency is critical. In some CF schemes the processor only charges wholesale prices for inputs, while in others farmers are formed into groups, which keep records of deliveries and payments for their members. By ensuring transparency, farmers are reassured that they are being treated fairly. A similar complaint about overcharging occurs when farmers are obliged to pay for cultivation services such as soil preparation, which under the terms of the contract must be provided exclusively by the company. If there are competing subcontractors, the agribusiness could allow farmers to use these services and then ensure that the activity had met its criteria. Concerns about quality of inputs, with consequences for the quality of output, are relevant here: fingerlings and day-old chicks must be of sufficient quality if farmers further down the value chain are to continue buying. As with the quality of output, so the minimum quality of inputs could be specified by external agencies and included in the contract. Problems with delayed or irregular inputs have repercussions for farmers and appear to be more common when logistics are left to a third party and not the processor. This problem has been widespread among outgrowers on the Mumias sugar scheme in Kenya (Casaburi, Kremer and Mullainathan, 2016). To ease concerns, good communication and transparency are vital: for instance, mobile phones now can be used to inform the agribusiness of deliveries (or delays). Post-contractual opportunism such as hold-ups can be avoided if agriprocessors offer long-term contracts and maintain a reputation for honesty (Otsuka, Nakano and Takahashi, 2016).

Table 6 below summarizes some measures which can mitigate opportunistic behaviour by processors.

TABLE 6.
Measures to mitigate opportunistic behaviour by processors

Problem	Measures
Manipulating crop standards	Prearranged standards prior to planting
Electronic instruments to measure quantities	Poor quality inputs
Ensure minimum standards are incorporated in contract	Overcharging for inputs
Ensure that price and transport costs are transparent	Companies could charge wholesale price plus transport
Allow subcontracting of certain farming activities to outsiders, subject to monitoring by companies	Poor delivery of inputs
Ensure effective communication through the use of mobile phones	Improve efficiency and penalize transporters
Post-contractual opportunism	Long-term contracts

1.6.5 Farmer groups and producer associations

Organizing farmers into groups can lower transaction costs and reduce the risk of default. Extension training is also less costly when provided to a group of farmers rather than individuals. This is especially the case when ICT is used for extension. Groups also allow farmers to share their agricultural concerns and experiences. For young farmers and adults, loans taken out as a group (rather than as an individual) offer an incentive for credit repayment. In the case of the Bidco palm oil scheme in Uganda, for example, credit is available only if seven or eight other farmers act as co-guarantors.

An interesting aspect of the Bidco CF coffee scheme in Eastern Uganda is the use of a hierarchy of farmers (Hansen and Rosenthal, 2014). There are lead farmers, site coordinators and field officers. Each lead farmer is in charge of a production organization of 25 farmers and is responsible for coordinating the coffee sales. Site coordinators and field officers conduct biannual farm inspections where they monitor the coffee production of participating farmers and give technical advice on the improvement of farm practices. Site operators and lead farmers manage demonstration plots jointly, providing extension and information on new farming practices.

Another aspect of the Bidco scheme is the role of the producer organization: it acts as the intermediary between the farmers and the processor: receiving crops and making payments, organizing credit and supplying inputs. Producer organizations are proposed as a check on the power of processors and a means of coordinating smallholders, although they can be difficult to establish and maintain because of conflicting interests. Producer organizations can obtain economies of scale by procuring inputs in bulk, and reduce collection and storage costs of produce at the time of harvest. They are a valuable means of improving the bargaining power of farmers, offsetting asymmetrical relationships with agriprocessors (IFAD, 2014b). They can also be marketing agents and lobbying advocates – as in the case of SalmonChile, the Chilean Association of salmon farmers, which interacts with governments, collects statistics and keeps abreast of market opportunities. In some cases, producer associations may be promoted by the agribusiness because of their benefits. One example is the multipartite project in Kenya, the Mumias Sugar Company (MSC); the MSC promoted a growers' association, which became responsible for farmer–business negotiations, as well as a channel for farmers' complaints and accounting.

Another means of reducing transactions costs is to use ICT for communications and for extension advice; this would be particularly attractive to young farmers. CF schemes should aim for efficient communication in order to be successful, and the agribusiness needs to monitor farms to ensure that certain tasks are completed, and disseminate information. Farmers must also be able to report on problems and whether inputs have been delivered as planned. This is particularly critical when logistics are separate from the agribusiness, as with the Mumias sugar cane operation in Kenya, where smallholders complained of irregular and late delivery of inputs and services, thereby jeopardizing their production. Mobile phones are widespread in East Africa with perhaps 70 percent of farmers having access to them in certain parts of Kenya (Casaburi, Kremer and Mullainathan, 2016). Preliminary evidence indicates that using mobile phones significantly reduced delays supplying inputs to farmers on the Mumias scheme (Casaburi, Kremer and Mullainathan, 2016). The agribusiness also reminded farmers of what tasks were required through the use of text messages; using ICT therefore contributed to higher productivity and lower costs.

1.6.6 Pricing practices of CF

Agriculture was one of the first industries to use contracting because of the perishability of its products and the long production cycle of some produce (Larsen and Asche, 2011). When crops are homogeneous and production techniques are known, contracting may

only involve pricing. Yet pricing arrangements may differ from linear pricing, spot prices plus a premium, or nonlinear pricing based on quantity discounts.

Most contracts in Africa use fixed prices, set at the beginning of each season according to grade specifications (Eaton and Shepherd, 2001). Fixed price formulas are commonly used with tobacco and canning schemes, whereby the processor pays a guaranteed price at the time of harvest based on a predetermined formula, plus a premium, and deductions for the cost of inputs provided during production. A formula that includes the cost of inputs has the advantage of reducing the risk of fraudulent behaviour by processors. By including input costs processors have less of an incentive to reject produce on spurious grounds. Farmers benefit from fixed pricing because it eliminates price risk and uncertainties on the demand side. For the agribusiness a fixed price provides more financial and marketing predictability and supply side uncertainties. For processors, there is the risk of setting forward prices too low and therefore giving farmers the incentive for side selling and strategic defaults (in order to avoid repaying loans) if the spot price is higher than a guaranteed fixed price. This danger can be mitigated by split payments: if farmers receive some payment during the production cycle (and not only at harvest) their need for cash is partly assuaged, reducing the incentive to side sell. Split payments therefore reinforce compliance with contracts (Minot and Sawyer, 2016).

Rather than a fixed price contract that specifies in advance what the farmer will receive, there is the alternative of flexible or spot pricing. A spot-price contract reduces farmers' risk against production cost uncertainty and the buyer against valuation uncertainty. It is commonly used in the sugar industry. The price takes into account world prices but also processing and other costs. Based on a predetermined formula, the processor pays the spot price at the time of harvest, plus a premium and deductions for the cost of inputs provided during production. An example is the Mumias PPP scheme for sugar cane in Kenya: farmers receive a price at the time of harvest rather than a prearranged price at the time of planting. Price changes are announced a few weeks before their implementation. The price reflects competitive forces, although it has been subject to political pressure from politicians (Casaburi, Kremer and Mullainathan, 2016). For farmers there is a trade-off to be made: on one hand spot pricing offers farmers potentially higher incomes than fixed pricing, but on the other hand, it contains the risk of uncertain incomes. In Thailand spot pricing is common; brokers collect produce from smallholders and once sold they reimburse farmers after deducting costs. However, the net price offered to farmers is often opaque and leads to disputes (Eaton and Shepherd, 2001).

In some flexible-price contracts profit-sharing can be successful if the processor is honest and efficient. With such pricing schemes there should be an accepted arbitration mechanism in place to address potential disputes over the relevant market price for the formula. The contract form preferred by the parties depends on their relative aversion to risk and the magnitude of the supply side and demand side.

In Norwegian salmon aquaculture both fixed and flexible price contracts are used, with the majority using flexible pricing formulae (Larsen and Asche, 2011). There are two objectives: the first is to reduce quantity risk for both farmers and buyers, and thereby optimize capacity in the supply chain. Retail chains preselect three to five farmers that meet quality standards. The producers have no guarantee that the retailer will purchase all the output but at least know that a minimum quantity is guaranteed. The second objective is to reduce price volatility. The pricing formula can be linked to the market price with some adjustments. There is also a formula, which has a base price, and a reference price bounded by the base price; if the reference price is close to the base price then the base price is paid, but if there is greater variation then the sales price is adjusted towards the reference price. This limits the price risk for producers and buyers.

1.6.7 Crop failure and insurance

Pricing may eliminate both price and market risks for farmers, but not crop failure. One means of reducing yield risk to farmers and to the agribusiness is crop insurance. Insurance is a means of reducing production risk if contingent claim contracts forgive debt with crop failure (Key and Runsted, 1999). Such causes can include “Acts of God” (force majeure), disease or weather. Farmers may be reluctant to pay insurance premiums due to credit constraints and myopia, but nesting insurance in a contract farming arrangement may make it more attractive (Casaburi, Kremer and Mullainathan, 2016). If bundled together with the contract, the farmer has the premium (plus interest) deducted from crop payment. Reimbursing for geographical area with satellite imaging, rather than for individual farms, could reduce weather insurance premiums. With all insurance there is the possibility of moral hazard so monitoring is important. Monitoring individual farms for possible insurance fraud is expensive, so insuring by districts is an alternative. Basing weather insurance on districts rather than individual farms using satellite monitoring eliminates moral hazard while not incurring unreasonable monitoring costs (Poulton, Dorward and Kydd, 2010).

1.6.8 Dependency and food insecurity

There is a risk that farmers become overly reliant on cash crops, and they may become so specialized or indebted that they in turn become overly dependent on the processor. In Zambia, for example, sugar cane contract farmers have almost become “captives” of the mill (World Bank, 2009). In Thailand, contracted farmers worked raising chickens for a centralized CF operation, but complained that they did not enjoy the benefits of employees. The courts decided the farmers were contractors and not employees (FAO, 2017 draft, 140–142) though the farmers felt they had become *de facto* employees (if not deemed so by law). In certain cases CF schemes have caused farmers to become landless. To encourage private investment governments may acquire land, which is then leased to companies. Examples include the Bidco CF oil palm scheme in Uganda and the tea scheme in Rwanda. The farmers displaced become landless, and effectively employees of the agribusiness.

The major risk of overdependence is food insecurity, if farmers concentrate too much of their land on cash crops and leave too little for household needs. Ideally, a company would suggest a proportion of land being left for household needs, as with the Mumias CF scheme in Kenya (Box 6). Schemes may also inadvertently create perverse incentives, as in the case of the Bidco oil palm project in Uganda, which provided loans based on the area planted (IFAD/IDS, 2015). Some farmers responded by planting all their land to this cash crop, at the possible risk of the household’s food security. The danger of over-reliance can be mitigated by information and communication; government and extension workers could also advise farmers about the danger, encouraging intercropping where possible, rather than monoculture.

1.6.9 Lack of trust

Ultimately, a sustainable CF scheme is built on trust. Actual or perceived misbehaviour undermines CF. Mistrust between farmers and processors has obliged farmers to withdraw from CF schemes in Thailand and would likely make CF schemes in the Indian Punjab unsustainable (Otsuka, Nakano and Takahashi, 2016). The importance of trust is evident in an interesting survey of dairy farmers in Kenya (Casaburi and Macchiavello, 2014). The farmers generally produce only a small amount of milk and have the option of selling the milk to a local co-op, or to traders. When selling to traders, farmers receive a higher price, face lower transport costs, and are paid more frequently – the traders pay daily whereas the coop only pays monthly. One would expect farmers to sell to traders, but they preferred the local co-op. The reason for this apparently irrational behaviour was the farmers’ desire for deferred payment (only

once a month) as a means of saving money, and they trusted the coop to honour the deferred payments more than the traders; even if traders offered deferred payments the farmers still preferred the co-operative, by virtue of greater trust.

Building trust requires a long-term view. Building a long-term relationship requires more than economic factors: historical, institutional and social elements must also be incorporated into the CF scheme (Lowith *et al.*, 2015). The agriprocessor should have local agents who speak the vernacular and who live in the community, rather than rely solely on expatriates living in a compound. Good communication among actors in the value chain and transparency is critical, with contracts written in the local language.

TABLE 7.
Risks of contract farming and mitigating measures

Risks		Who bears the risk?	Mitigating measures
Production risk	Weather, pests, etc.	Farmers	Research, training of farmers, quality seeds and other inputs, insurance
	Farmers fail to supply sufficient quality and quantity/"hold-up"	Company	Link farmer loans to crop yield
	Side selling	Company	Nucleus estates, training of farmers
	Input diversion	Company	Table 5 above
	Unreliable/poor quality inputs	Farmers/Company	Table 6 above
Price risk	Spot price > forward price	Company	
	Forward price > spot price	Farmers	
Market risk	Farmers fail to supply quantity and quality	Company	Nucleus estate
	Side selling	Company	Table 5 above
Financial risk	CF scheme fails	Company/Partner	Due diligence prior to investment; group guarantee of loans.
	Farmers default voluntarily	Company	Deduct loan repayments directly from sales; make loans a responsibility of farmers' organization; bundle crop insurance with contract.
	Farmers default involuntarily	Company/Farmers	Make insurance based on regional rather than individual farms: use satellite imaging; weather forecasts through mobile phones.
Land/water usage risks	Farmers lose usufruct rights	Farmers	Complete and transparent consultation with all stakeholders.
Environmental risks	Land/water degradation	Company/Farmers	Environmental audits, Codes of conduct.
Risk of side selling	Refer to Table 2	Refer to Table 2	Refer to Table 2
Risk of quality manipulation	Refer to Table 2	Company	Use formula price contract Adjust forward prices Split payments Use futures market.

Source: Adapted from IFAD/IDS (2015).

In conclusion, CF can fail for a number of reasons but some of the most important are:

- The absence of informed decision-making when investing, both on the buyers' and farmers' sides, due to the ill-informed desire to make quick gains;
- governments/development partners/NGOs promoting CF for development objectives without looking at the viability of it as a business – i.e. the capacities required, farmers' aversion to risk, the investment/management capacities of buyers and/or the specificities of crop/locations;
- buyers relying on government/development partners/NGOs for the selection of locations and farmers without considering that criteria need to be guided by a business rationale and not by location decisions and/or the development objectives of third parties;
- low productivity and the trade-off between household food security and CF crops, especially with reference to competition for scarce smallholder farm assets (opportunity costs for the use of land, labour and capital assets for CF production – even labour is frequently more scarce than many may think);
- lack of scope for negotiation/voice of farmers in designing CF arrangements and deciding on contract terms as a result of an uneven balance of power (lack of farmer organizations and information on markets, prices, technologies), the lack of transparent communication by buyers or third party mediation;
- contract default either by buyers (delayed or non-payment, unjustified rejection) or farmers (side selling, supply of low qualities) due to lack of trust, lack of transparency in contract terms, opportunistic behaviour and short-sighted preference for short-term benefits over long-term advantages (e.g. side selling by farmers when other buyers offer higher prices without considering the long-term benefits of reliable market access, particularly for products featuring fluctuating prices);
- the failure to build solutions for contract default into farming contracts (e.g. including contract terms such as weather insurance or dispute resolution mechanisms that become effective in the event of default by farmers or buyers, or external risks such as force majeure); governments/development partners/NGOs creating disloyal competition through the creation of subsidized parastatal or NGO-type companies, allegedly to provide smallholder farmers with market access, but in reality not as a viable and sustainable solution; the complexity of the undertaking is underrated in all phases of CF development (start-up, implementation, consolidation and upscaling) and the time, effort and resources required from contractors and third party supporters is underestimated as a consequence (GIZ, 2013).

2. Contract farming and youth

In sub-Saharan Africa, 62 percent of young people work on family farms; agriculture is therefore seen as a solution to youth unemployment (IFAD, 2014a). They are often unpaid and unprotected, with women particularly vulnerable given cultural norms and family responsibilities. Africa not only has the highest share of “youth” (those between 15 and 24) but it is the only region where the trend is expected to continue for decades (Resnick and Thurlow, 2015). This youth bulge (more than 60 percent of the population) results from falling lower child mortality rates in countries with continuing high fertility rates. Females constitute the majority of young people and their unemployment rates are higher than those of males. Within sub-Saharan Africa unemployment rates of all youth exceed those of adults, with the disparity particularly acute for females (Thurlow, 2015). Disaggregated by age groups, employment elasticities tend to be lower for youth than for adults: within sub-Saharan Africa elasticities for male youths are 0.52 percent compared to adult males (0.70 percent); similarly, for female youth they are 0.56 percent versus 0.80 percent for adult females (Furceri, Crivelle and Toujas-Bernate, 2012). Even with this relatively unfavourable ratio, projections suggest that if economic growth continues at the same rate as in the recent past, and if there is a focus on agricultural and rural activities, youth unemployment in East Africa could fall to 17.7 percent by 2030 (Thurlow, 2015). As the President of the African Development Bank is quoted as saying in 2017, “making agriculture profitable and ‘cool’ for young people in Africa is key to lifting millions out of poverty” (Barrett *et al.*, 2017).

Yet, in spite of its importance in the economy, for many young people agriculture is not an occupation of choice, but is adopted because of a lack of alternative opportunities. Many young people tend to have a negative attitude towards agriculture. Table 8 gives the principal reasons for the lack of interest in agriculture derived from a regional consultative workshop with young people in East Africa.

TABLE 8
The principal reasons for young people’s disinterest in agriculture

Rank	Reasons
1	Shortage of production resources – land, finance
2	Negative attitude towards agriculture
3	Limited agricultural knowledge as well as leadership and managerial skills
4	Limited youth groups and associations/cooperatives
5	Youth involvement in decision-making still low
6	Attraction of quick gains, especially from white-collar jobs
7	Lack of youth policies
8	Lack of support from elders for young people in agriculture
9	Lack of experience and skill sharing
10	Lack of market accessibility.

Source: Proctor and Lucchesi (2012).

2.1 ACCESS TO LAND

Table 8 indicates that young people are deterred from working in agriculture mainly because of poor access to land. Inadequate access to land is closely related to rural

poverty, and is reflected in young people’s pessimism towards agriculture (Jayne, Mather and Mghenyi, 2010; FAO, 2014; Sumberg *et al.*, 2015).

Under a usufruct land rights system, inheritance is still the most common means of obtaining land. In a 2008 household survey of several countries in sub-Saharan Africa that did not include Burundi and Rwanda households were asked how they expected their children to obtain access to land (Proctor and Lucchesi, 2012). Most relied on passing on land already cultivated through inheritance. Kenya is the country surveyed where opportunities for land access by young people are particularly limited. In Kenya young people have almost no possibility of obtaining access to land except through inheritance. In the survey, 94 percent of Kenyan households expected their children to have to inherit land that was already under cultivation. There was almost no expectation that children could obtain land that had not been previously cultivated or land that was lying fallow. Borrowing, renting or purchasing land was also considered unlikely. Similarly, in Ethiopia and Malawi most intergenerational transfer of land would come through inheritance. The opportunities for young women to inherit land were even more meagre than for young men (FAO, 2014).

However, obtaining land was more nuanced in Uganda. Households still expected their children to gain access to land already cultivated (58 percent), but unlike Kenya, 29 percent of households expected their children to be able to purchase land – in Kenya no household thought their children would have that option. In neighbouring Tanzania almost half the households thought their children would acquire land through purchase. Further differences emerge in countries where land is relatively plentiful, such as Mozambique and Zambia. Households in those countries expect their children to obtain land that had not previously been cultivated, or that had been lying fallow, rather than inherit land that was already under cultivation. Two other outlier countries were Ethiopia and Ghana, where about one fifth of households thought their children would be able to borrow or rent land. Young people with few expectations of inheriting land (or opportunities to rent land) are therefore discouraged from working in agriculture or even staying in rural areas. Without access to land either by inheritance or renting, older male “youth” (those aged 20 to 34) are “pushed” towards urban migration as a last resort (Kosec *et al.*, 2017).

It should be noted that young women are particularly handicapped with respect to land access. According to customary laws, land usually passes from father to son. Women usually, therefore, only access land through their relationships with male relatives: as a result, women own less than 5 percent of agricultural landholdings in sub-Saharan Africa (IFAD, 2014a). This difficulty in accessing land is reflected in limited ambitions. When young female coffee and tea farmers in Rwanda were asked what they would be or be doing in 10 years’ time if they had the choice, they largely focused on very modest agricultural projects (IFAD, 2010). Increasingly, however, statutory laws have been adopted in sub-Saharan Africa that overturn customary laws and give women equal access to land; adoption is not synonymous with implementation however, which takes time and education. In Rwanda community leaders are trained how to implement the statutory laws (IFAD, 2012).

2.2 LAND POLICIES

Making more land available for individual use, and easing restrictions on land rental markets, could have a major impact on youth unemployment. Reform of land property rights was a key factor in Vietnamese development (Salami, Kamara and Brixiora, 2010). The reform provided incentives for farmers to increase productivity and to use the land efficiently. As noted above, Ethiopia and Ghana appear to provide land for rent more easily than some other countries in sub-Saharan Africa.

In Uganda a private company and local governments are active intermediaries in leasing land for young people (FAO/IFAD, 2014). Rivall Uganda Limited (RUL)

BOX 6

Case Study. Youth in Aquaculture/Agriculture: Nigeria

AGRIC-YES (Agriculture Youth Empowerment Scheme) is a PPP between the Lagos state government and the Israeli company Dizengoff. The overall aim is to encourage a new generation of agro-entrepreneurs. The government's role is to fund the scheme, while the Israeli company manages the food production and processing facilities for the government. The agreement was formalized as a joint-venture partnership that targeted young graduate farmers as beneficiaries. Dizengoff is paid a management fee by the government and returns modest profits. A management service arrangement obliges Dizengoff to set up training, food production and processing facilities, supporting young agro-entrepreneurs for six months.

A six-month intensive training programme provides young people with the skills for productive employment in modern agriculture. They then continue to another six-month internship on a commercial farm, managed by the partnership, where they are exposed to best practices in modern farm management. While the agro-entrepreneurs are on the government-funded training programme they receive a small allowance, and for the second phase a monthly wage. The best trainees go to farms in Israel for a further internship. On completion, these graduate farmers will be settled in contiguous landholdings provided by the government across the state. They are given 1–5 ha of land to start their agribusiness, depending on the requirements of the productive activity, and kits for intensive greenhouse drip irrigation. The infrastructure can serve as an aquaculture farm to produce fish fingerlings and table fish. They also receive loans with soft repayment terms, and have access to extension services and microfinance loans.

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The PPP aims to tackle the major challenges facing young people in agriculture. Access to land is provided, thereby obviating a critical constraint for young people. A major obstacle to commercial farming is credit on manageable terms, and this was organized after the Lagos state government initiated long-term investment credit agreements with the Central Bank of Nigeria for agricultural development in the state. A further constraint is training, and the PPP ensured that students received up-to date guidance in farm management. With these tools, the students were encouraged to continue in agriculture, providing an example to other young people.

Wider benefits also followed. More than 800 contract farmer groups have been trained in the improved techniques, which were then disseminated to more than 300 000 farmers/fishers. The result has been sharply increased food production.

Source: FAO (2013b).

trades food grains, vegetable oils and honey, but has found it difficult and expensive to acquire sufficient quantities from smallholders. It works closely with the local authorities to sensitize landowners with regard to young people and their need to access land. The local authorities are essential partners, as they assist in convincing landlords to lease their land. Since 2011, RUL has also been working with youth groups (which must have at least eight members aged 18–35, three of which must be female) to lease land. The leases are with landlords who did not wish to use their land for a year. Payment is made in cash or a proportion of the produce. The Land Commission must approve the lease, and thereafter the youth groups are informed. Following interviews a group will be allocated the land, and RUL also leases machinery for tilling the land.

All the extension workers working with RUL are under the age of 30; they provide close assistance to the youth group, connect them to buyers and recovering payment from the sale of produce. The scheme is a win–win for all parties: young people earn higher incomes, landlords receive payment for land that might otherwise be fallow and RUL obtains reliable supplies. The key to the success of the scheme is attributed to working with groups rather than individuals. Working in groups raises morale and ensures the work will be done by at least one member of the youth group.

In the case study below, the Lagos state government in Nigeria provides access to land for young people who wish to pursue agriculture or fish farming. Not only do they receive land but also inputs and training. This initiative is probably only feasible in countries with uncultivated land.

2.3 ACCESS TO CREDIT

In addition to land, credit is also seen as a major barrier for young people. More than 70 percent of young farmers surveyed stated that access to credit is their principal challenge (IFAD, 2012). This constraint is common for most smallholders, not only the young. In Kenya smallholders cite the lack of capital and access to affordable credit as the key cause of low agricultural productivity (Salami, Kamara and Brixiora, 2010). Seasonal funding historically has been a prerequisite for increasing agricultural productivity, because loans enable farmers to acquire inputs such as fertilizer and technical assistance (Poulton, Dorward and Kydd, 2010). However, less than 1 percent of African commercial lending presently goes to agriculture, despite the sector's importance (Salami, Kamara and Brixiora, 2010). Moreover, most loans to the sector go to large-scale farmers. Smallholders usually find commercial credit inaccessible because they lack collateral and a credit history. Banks perceive lending to smallholders as too risky, and too costly because loan amounts are small and transaction costs are high, particularly in isolated rural areas. The inability to repay because of weather or rainfall is costly to verify, and large-scale weather insurance schemes have largely failed. Instead, smallholders must rely on their own resources, family and informal moneylenders.

Young people face a particular handicap. Financial institutions see young people as riskier than adults partly because they lack land. Moreover, they generally lack expertise in developing credible business plans. The situation is particularly stark for young women in spite of their greater reliability in repaying loans (Proctor and Lucchesi, 2012). Young women tend to have less access to land that can be used for collateral, and are usually less educated than men (IFAD, 2012).

2.4 CREDIT POLICIES

However, as noted in the case studies, there are partnerships that can entice innovative commercial banks to extend financial services to isolated rural areas in East Africa. There is also the potential to use informal financial institutions.

In Sierra Leone, financial services associations (FSAs) are locally owned and offer financial services to local people in their community. The project (funded by IFAD)

leaves young people to manage the FSAs. Each one has a manager and a cashier, who must be between 21 and 29 years old; hiring young people is seen as an investment in the sustainability of the FSAs, and it also promotes their integration into their communities.

Similarly, Accumulating Savings and Credit Associations (ASCAs) and Rotating Savings and Credit Associations (ROSCAs) are saving groups which lend money at interest rates lower than microfinance institutions (Muiruri, 2013). Many are predominantly owned and managed by women. They are flexible, allow for the renegotiation of loans, and have low overhead costs. However, like microfinance institutions, they are reluctant to lend to agriculture. To limit default, loans could be given only with co-guarantors – as in the Bidco palm oil scheme in Uganda, which insists on 7 or 8 other farmers acting as co-guarantors (Case 7). However, they must have a land title, which makes the strategy less applicable to young people.

For young people without land as collateral for a loan, another possibility is using warehouse receipts. In one district of Tanzania some young people established an Agricultural and Marketing Cooperative Society in order to grow sunflower and millet. Both crops have markets. In order to obtain credit, the Coop uses the warehouse receipt system. This enables them to receive advances guaranteed by the grain stored in the warehouse (IFAD, 2012).

Combining group loans with financial counselling reduces risks for both farmers and financial service providers. An example is the programme for the development of rural employment in Cameroon. This programme establishes young farmers into Common Initiative Groups (CIGs). The financial agency (the national employment fund) visits the CIGs to discover their financial needs, which obviates travel costs for farmers and paying a commission. Inputs such as fertilizer and pesticides constitute the bulk of the loan, with the remainder going into a bank account of the CIG (IFAD, 2012).

Partnering with banks and other private companies can facilitate access to credit for young people. In Kenya, the Ministry of Youth Affairs and Sports partners with companies that specialize in ranching and green house farming to give loans to young entrepreneurs to buy cows for export and to set up greenhouses (IFAD, 2012). Another example comes from Uganda: in 2011 the Government launched the Youth Venture Capital Fund in partnership with three banks (IFAD, 2014a). It is a venture capital fund to finance projects put forward by young entrepreneurs and enable them to benefit from mentoring services from the participating banks. Youth entrepreneurs must be aged between 18 and 35. Each business project must provide employment to at least four people by the end of the loan period. Eligible sectors include: agroprocessing, primary agriculture, fisheries and livestock. Applicants must be willing to train in finance and business management. The maximum period of a loan is four years and the amounts range from US\$39 to 2 000 for individuals.

TABLE 9
Measures to increase credit for young people in agriculture

Problem	Measures
Lack of collateral i.e. land tenure	Use guarantors: could be other farmers (Case 7 in Uganda), Central Bank (Case 12 in Nigeria), Agriprocessor
Warehouse Receipt System	Reduce need for collateral (Case 1 in Kenya)
Reduce risks	Crop/weather insurance
Partnerships with private companies	Form youth cooperatives Provide training on financial aspects such as business plans.

BOX 7

Case study: PPP for poultry production with access to land for youth: Nigeria

The Shonga commercial agriculture initiative is a PPP in Nigeria that began in 2005. In addition to chickens, with a processing factory for a minimum of 7 500 processed chickens per day, the project cultivates several crops. Its focus was on viability and profitability, with farmers declaring profits in the first four years. Currently, total agricultural output is increasing substantially as production expands and improved farming methods and techniques are disseminated to a smallholder population through a planned agricultural programme.

The partnership comprises five Nigerian banks, the Kwara state government and some dispossessed farmers from Zimbabwe, and is managed by Shonga Farms. Farmers were each given 1 000 ha of land with a long lease for commercial farming purposes. The banks own a 45 percent share, the farmers own 40 percent and the state owns 15 percent, but once the banks obtain their investment returns, farmers can acquire the bank shares and own their respective farms. The aim of the partnership is to create a commercial farming hub in Kwara that will not only benefit farmers but also provide a base for capacity building and the infrastructural development of the local farming community. The partnership was envisaged in 2004 by the government of Kwara state, which invited the displaced farmers from Zimbabwe to develop commercial farming in the state. The government's role is to provide an enabling environment and the role of the farmers is to teach best farming practices to local farmers and transfer their knowledge of commercial farming to the state's agricultural sector.

The partnership has completely revolutionized Kwara's agricultural sector. Numerous incentives have attracted investment in the sector with land easily available with the assistance of the state government. Local farmers are taught about various farming practices at the Youth Training Farm and, once they graduate, they are offered 5 ha of land and a loan to facilitate their skills as the next generation of commercial farmers. Agriculture inputs such as tractors and fertilizers are currently sold or hired to farmers at greatly subsidized prices, and the PPP enables local farmers to be trained in the production of poultry by using modern technology. Moreover, the surrounding infrastructure developments that have resulted from this PPP – i.e. irrigation, electricity and transport, illustrate its success.

Source: FAO (2013b).

2.5 ATTITUDE TOWARDS AGRICULTURE

In addition to socio-economic factors, Table 7 indicates that young people have a negative attitude towards agriculture. Young people in rural areas of Kenya, particularly women, see more opportunities for themselves outside agriculture, and if given a grant most would not invest in agriculture (FAO, 2014). One survey of young people in rural Ethiopia revealed that “aspirations are not just about economic opportunity – status is important: agriculture is unappealing to young people because it does not bring status regardless of economic outcomes” (IFAD, 2014a). The lack of status of agriculture is confirmed by a survey of 900 households in Kenya. Almost two thirds of respondents (64 percent) considered paid employment a better alternative (Proctor and Lucchesi, 2012). Agriculture was seen by youth as a form of punishment and a sign of failure. Schools were also criticized for contributing to the negative image of agriculture, by using work in the school garden as punishment. Even horticulture was unpopular in the survey because it was not mechanized, and therefore seen as drudgery. The

negative attitude towards agriculture is not confined to young people, but appears to be widespread across generations (Caretta and Borjeson, 2015).

2.6 IMAGE POLICIES

However, there are policies that could promote the status of agriculture. To counter the negative image of agriculture there are schools that integrate agriculture into science and/or business curricula, and use school gardening as a promotional tool. These appear to be successful. An example is the Developing Innovation in School Cultivation (DISC) programme in Ugandan elementary and secondary schools, which demonstrates food production and seed banks to students, using school gardens to demonstrate the cultivation of indigenous plants and how to protect seeds for the next planting season.

Even though rural education tends to be inferior to urban levels, education has become more widespread, making knowledge more accessible. Information and Communication Technology (ICT), particularly mobile phones, is increasingly applied in agriculture. Innovations such as those providing input and output pricing information can contribute to enhancing the attraction of agriculture for young people. An example is Mfarm in Kenya, an agribusiness software company that connects farmers, suppliers and buyers. Started by three young women, Mfarm provides current output and input prices and enables farmer groups to access discounts on their purchases. It provides weather forecasts and allows farmers to post an SMS specifying the produce they wish to sell. They hope that using innovation of this kind will attract other young people to agriculture (IFAD, 2012).

2.7 TRAINING

Further factors undermining interest in agriculture among the young are the lack of technical knowledge, and inadequate youth participation in decision-making. The relationship between education and participation in CF is clear; on one hand, educational levels and CF participation are not positively correlated: only four out of 21 studies in developing countries show a positive and significant relationship (Otsuka, Nakano and Takahashi, 2016), and indeed, highly educated farmers abandon vegetable production for supermarkets in Kenya more than less educated farmers (Otsuka, Nakano and Takahashi, 2016). On the other hand there is a demand for more technical and vocational training, with skills related to business among the topics of interest. Often the young who go into farming are very business orientated and entrepreneurial and go into agriculture only if it offers a business opportunity (IFAD, 2014a).

2.7.1 Training policies

Using ICT extension services can be offered interactively and efficiently. One example is the Savannah Young Farmers Network (SYFN), a youth-led NGO in Ghana, which provides information to young farmers interested in agriculture as a business by establishing Audio Conferencing for Extension (ACE). It also facilitates a two-way dialogue between farmers and extension workers. Groups of 10–12 farmers can ask advice and receive videos demonstrating some of the challenges faced by farmers. Thanks to invited participants from financial institutions and the public sector it also provides information on marketing, credit and other business topics. Reports indicate that the scheme has had a positive impact on the number of young people interested in agriculture (FAO/IFAD, 2014). Another example on how ICT is used for extension services is the case of the MKulima Young online platform in Kenya. This platform was established with the aim of encouraging youth to work in agriculture; its members are mostly farmers and 95 percent are under the age of 32. It is also interactive with farmers receiving advice from other members, and they can sell their produce or buy inputs online (FAO/IFAD, 2014).

Another option is to rely on young people as extension workers. A PPP project in Sierra Leone involves Goldtree Holdings, backed by the African Agriculture Fund, in a project to revitalize the oil palm industry (IFAD, 2014b). Goldtree’s strategy is to obtain more than 90 percent of its production through small-scale farmers. To increase productivity of the smallholders Goldtree has developed an extension service composed of farmers with landholdings (mainly young people, with women accounting for nearly 50 percent) who have been trained in pruning and maintenance and are available to other farmers for a fee.

3. Public–Private partnerships

Table 3 indicates that aquaculture and poultry are ideal subsectors for CF and PPPs. As previously mentioned, in the USA almost 90 percent of poultry are sourced through CF; in Brazil the proportion is 75 percent. Perishability, food safety standards, necessary technical expertise, and high fixed costs in processing are among the attributes that make CF attractive. Fish, eggs and chicken are highly perishable and require quality controls to attract repeat buyers and a sustainable market. Farmers growing fish and fingerlings, but also chicks, must minimize mortality rates and that requires technical training. Education in bookkeeping and financial planning is also necessary. Another attribute that makes CF attractive for aquaculture and poultry is the heavy fixed cost in processing and ensuing economies of scale.

Public–private partnerships (PPPs) can be defined as a governing arrangement where one or more public agencies directly engages non-state stakeholders in a collective decision-making process that is formal, consensus-oriented and deliberative, and aims to make or implement public policy or manage public programmes or assets (Björstig, 2017). The aim of PPPs is to create a relationship to allocate the risks to those best able to manage them and to add value to public services by using private sector skills and competence (Weirowski and Hall, 2008). They take a wide range of forms with different degrees of private involvement. The two common elements of a PPP arrangement are the provision of public services and the sharing of risk. The terms of a PPP are typically set out in a contract or agreement to outline the responsibilities of each party and clearly allocate risk. The arrangements may involve civil society stakeholders as well as government and the private sector.

There are several potential advantages of a PPP (Weirowski and Hall, 2008). They are:

- To improve the quality of service. The private sector has an incentive to be efficient whereas the government has experience in regulating; if properly defined, a PPP contract can also stimulate innovation through performance indicators and penalties.
- To improve cost-effectiveness. PPPs allow the public sector to take advantage of private sector innovation, experience and flexibility.
- To increase investment without an onerous burden on public resources. By bridging the gap between infrastructure needs and government financial capacity, PPPs can provide public goods and services without recourse to taxpayers.
- A better allocation of risk: risk can be allocated to the party best able to manage it at the lowest cost.
- Faster implementation. If payments are linked to service delivery the private sector has an incentive for expeditious completion. PPP can also proceed with service delivery when there are constraints on public investment.
- Increased investment in technical innovation. PPPs can create incentives to develop new technologies and can avoid being subsumed under government budgeting cycles.

PPPs may involve improving access to supply chains and markets, producing new products, and capacity building. Unlike contract farming, PPPs are not limited to the primary sector, but can be involved in transport infrastructure, health or other government services. However, in agriculture and aquaculture, PPPs and CF can be interchangeable. Table 10 indicates some areas of agriculture and aquaculture where PPPs can be used effectively.

TABLE 10.
PPP activities in agriculture/aquaculture. Supply chain management and credence conditions

Rank ¹	Area	Examples of products/services	Public/Private sector partners
1	Food safety/ quality	Production standards Fertilizer vouchers Fertilizer subsidy Post-harvest handling Processing infrastructure Market information systems Certification systems Traceability services Marketing alliances	Government institutes NGOs Development assistance Producer associations SMEs Importers/Exporters/Traders Certification auditors Private labs Fish processors Retail chains
2	Business development	Multiple water use Land management Market information systems Business development	Central/local government Public research International agencies NGOs Businesses Water owners Producer associations
3	New products and market access	Niche (organic) products Products for exporting Products to replace imports	Central/local government Public research International agencies NGOs Exporters Agriprocessors Hatcheries On-growing farmers
4	Infrastructure: general and sector-specific	Rural roads Rural ICT One-stop-stations (seed, feed, finance, etc.) Transport/logistics Aquaculture zones Waste water treatment Seed dissemination Irrigation Feed supply	Government breeder centres Government departments Research centres Public hatcheries Hatcheries Nurseries On-growing farmers Feed suppliers Logistical services Diagnostic services
5	Research and technical development	EIA Supplier networks Implementation of standards and best practices Integrated agriculture/ aquaculture/ Use of waste in production chains Seed research	Government departments Research centres Producer associations Primary producers Processors Industry associations
6	Capacity building	Extension contracting Extension vouchers Demonstration farms Fish health services Entrepreneurship training	Public institutions Universities Research institutes Public extension services Producer associations Key producers Private educational/training institutes
7	Financial services	Microcredit Credit guarantees Specific loans related to skill development Lease or franchise	Development banks Financial service providers Development assistance NGOs Economic institutes

¹ Ranked by their priority in 25 PPP agriculture/aquaculture projects

Source: Adapted from Weirowski and Hall (2008); Poulton and MaCartney (2011).

According to a literature review of 25 PPP projects in developing countries in aquaculture and fisheries, supply chain management appears to be the most important priority of PPPs (Weirowski and Hall, 2008). This is the top item in Table 9. Of the

25 PPPs, 15 had supply chain management as a main objective. The second most common theme was business development, while the provision of general and sector-specific infrastructure came third. Two categories of the 25 were equally ranked by importance. They were projects that either focused on capacity building, or developing new products, such as techniques for breeding ornamental fish.

Case studies illustrate what PPP can accomplish in promoting the agricultural/aquaculture sector. They can also pinpoint some common characteristics, and even some deficiencies. In all cases there are partnerships with private companies, which have their own corporate agenda. Corporate goals may be to maximize profits but they can be compatible with broader socio-economic development.

3.1 SUPPLY CHAIN MANAGEMENT AND CREDENCE CONDITIONS

Private importers from developed countries initiate most of the chain projects in order to meet consumer standards. As noted above, CF can provide smallholders with access to the value chain; similarly, an agribusiness in a PPP can source produce from smallholders while indirectly enabling them to sell internationally. They can also ensure that produce from smallholders meets food and safety standards, provide certification and guarantee traceability. For example, domestic processors of catfish in Vietnam have effectively become guarantors of food and safety standards for export. The ultimate goal of improving the chain was to increase access to national and international markets. Organic certification, product handling, food safety and marketing all fall into this category. Investing in new aquaculture species, or organic products, incurs both production and marketing risks. Private companies with “deep pockets” may be willing to undertake such projects if there is a partnership with governments or research agencies. Examples in the case studies of agriculture include the organic cultivation of cocoa in Uganda and Sao Tome and Principe, and organic coffee in Uganda. Marketing risks exist for projects focused on the substitution of imports and exports and again PPPs can be effective. Case studies of oil palms in Uganda, rice cultivation in Nigeria and tea in Rwanda indicate that with development assistance PPPs can succeed even when employing CF with smallholders.

BOX 8

Case study: PPP in poultry production in Ethiopia and Rwanda

With financial support from USAID and its Feed the Future Partnering for Innovation programme, EthioChicken has imported improved chicken breeds into two regions of Ethiopia, Amhara and Tigray. The existing breeds have low weight gain and low egg-laying productivity, and are highly susceptible to disease, with a high mortality rate. With the new breeds the aim is to improve productivity and reduce costs. In addition to importing the improved breeds, EthioChicken provides mills, feed and vaccines. A network of rural sales agents distributes the chickens and feed to farmers, in addition to providing technical assistance and customer service pre- and post-purchase.

To date, EthioChicken has recruited and trained 450 sales agents, who have sold 3.2 million day-old chicks to approximately 640 000 farmers. The farmers can earn over three times as much revenue selling eggs and two times as much selling live chickens. It is very attractive to women because poultry production requires little land and capital, to which women often have limited access. The partnership also works with local marketing firms to promote the importance of nutrition to Ethiopian communities, further promoting the new breed of chickens. EthioChicken has signed a 25-year agreement with the government of Rwanda to implement a similar scheme there.

Source: Sarasvathy and Morse (2017).

Similarly, PPPs can assist with post-harvest losses of vegetables and fish. Spoilage accounts for a high proportion of vegetable and fish harvests, and one solution is installing cold-chain storage. An example of using PPPs to increase storage is the Ghana Grains Council. Members of the Council include private companies, farmer organizations, financial institutions, and private individuals. This private, non-profit organization provides negotiable warehouse receipts for grains, enabling farmers to store their produce with confidence.

BOX 9

Case study: PPP in poultry production: Thailand

An example of a successful poultry partnership comes from Thailand, which is one of the pioneers of contract farming in Asia. Its principal agribusiness company Charoen Pokphand (CP), (which also contracts shrimp farmers), began establishing contracts with chicken farmers in the 1970s. In order to encourage CP to participate, the government has offered time-limited tax incentives; among these are exemptions from payment of import duty on machinery and income tax, and reductions in profit taxes. With its centralized model and market-specifying contracts, many small-scale farmers provide CP with chickens, which are then processed and marketed. Farmers must invest in a closed unit with an evaporative cooling system, but CP provides chicks, feed and medicine (on credit). The farmers must raise the chickens in accordance with strict instructions provided by the company, and when the chickens reach the required weight, CP comes and collects them. The company then pays the farmer according to the performance (feed conversion ratio and mortality rate) and the market price.

Source: Delforge (2007).

3.2 BUSINESS DEVELOPMENT

The second-most-common category in the literature review was business development. The projects aimed to improve production management procedures and to support farmer associations. Case Study 5 indicates how a farmers' association (the Kalangala Oil Palm Growers Trust) acts as an intermediary between the agribusiness and farmers.

3.3 NEW PRODUCTS AND MARKET ACCESS

The development of (niche) products has been an additional focus of PPPs. In some cases this is organic produce, which requires considerable production expertise or knowledge of markets, while in others it is produce for export or the substitution of imports.

3.4 GENERAL AND SECTOR-SPECIFIC INFRASTRUCTURE

Fish feed, its cost, quality and delivery, is a major determinant of financial viability of aquaculture. PPPs can assist with input costs and quality (see Case 2 with horticultural crops in Kenya). They can also use technology to source local ingredients. Nutreco, the world's largest fish feed producer, partnered with the Chilean and Peruvian governments and an environmental NGO to replace fishmeal with local feed ingredients (Weirowski and Hall, 2008).

3.5 RESEARCH AND TECHNICAL DEVELOPMENT

The lack of interest in the dissemination of improved seed for aquaculture is a surprise because improving seed quality is important in many national aquaculture strategies (Weirowski and Hall, 2008). In aquaculture, the main infrastructural needs are

BOX 10

Case study. PPP in poultry production: Bangladesh

The poultry industry in Bangladesh faces numerous challenges. Less than 20 percent of poultry come from the commercial sector: most are in rural back yards as scavengers. The value chain for marketed chicken is very loose, while feed is variable and expensive, accounting for more than 60 percent of production costs. Mortality rates are high, at more than a third, and the source of day-old chicks (DOCs) are imported breeds from North America and Europe.

In 1994 a large company, Aftab Bohumukhi Farms Ltd (ABFL) established a CF poultry system in partnership with NGOs. ABFL extends credit facilities to farmers, it provides DOCs, feed and in-kind veterinary supplies on credit (or cash) and organizes sales. Inputs account for about 90 percent of total production costs, which leaves farmers with only 10 percent. Farmers build covered sheds at their own expense under the supervision of ABFL. The average duration of the maturation cycle is five to seven weeks for a 1.5 kg broiler, which is then bought by ABFL after deduction of input costs. The farmers make all management decisions and farms can be any size. In order to reduce risks ABFL has introduced insurance to cover the risk of loss of chicks through disease. ABFL's insurance scheme operates a contributory security fund. Farmers contribute a small amount at the time of purchase, with a refund based inversely on mortalities. If the mortality rate is above 15 percent, farmers can claim full insurance compensation. Production risk is therefore mitigated, which makes CF attractive to smallholders.

The scheme benefits ABFL and farmers. ABFL obtains a regular source of inputs while farmers gain access to a market, saving them transaction costs. The integrator farm guarantees a regular supply of raw materials while small farmers have access to a ready market for their products. Benefits to contract farmers also include access to credit and technology, better risk management and improved family employment. A positive externality is exposure to a commercial activity with concomitant entrepreneurship.

Source: FAO (2013c).

improvements to seed dissemination, feed production and supply networks, and the post-harvest handling and transportation of products from fish farms to processors or markets.

Much of the private sector's reluctance to undertake crop or species research is the inability to maintain ownership of many of the benefits of the research, as the protection of intellectual property rights to bridge the gap between public and private returns may not be enforced (Kremer and Zwane, 2005). "Push" funding can be available for research that private companies receive, even if there are no results, but that can be wasteful. Another option is "pull" funding for research, by which the private company is paid when results are secured. However, the private company must be prepared to incur the financial risk of unsuccessful research trials. One way to achieve efficient seed dissemination is to link public research stations – that can supply superior broodstock – with networks of private hatcheries (Weirowski and Hall, 2008). Joint research in developing genetically improved fish strains could be a 'win-win' for both the private and public sector. In this sense, collaboration between companies and research institutes can mitigate risks for the private sector and be a source of revenues. An illustration is the case study of the Brazilian public research institute, Embrapa. Another example is the state of Louisiana in the United States of America, where research into the fish strains of its diverse aquaculture has been undertaken by public

BOX 11

Case study: Cooperatives and tea for export: Rwanda

The Project for Rural Income through Exports (PRICE) expanded the previous scheme, which had been formed by a partnership between two tea producing cooperatives and private companies. The tea factories bought directly from the co-ops, and the co-ops had an equity share in the factories, which had been purchased on their behalf by IFAD. The first project involved 20 000 tea growers.

PRICE replicates the earlier model to develop new tea plantations with another 14 300 tea growers on new and existing sites. The government has given land leases to the private sector and cooperatives operating on the tea sites and provided technical support and inputs such as seedlings and fertilizers to the cooperatives to improve production and financial management. The government has also invested in rural feeder roads in areas where the factories have been established. Cooperatives will acquire equity shares of 30 to 40 percent in factories to be built on four sites. PRICE plans to improve production practices and strengthen farmers' organizations. It also supports the process of obtaining certification for the tea and facilitates access to financial services. Thanks to price increases, smallholder farmers have enjoyed 11 to 40 percent increases in income. There are more jobs, better access to health services and additional seasonal work.

Source: IFAD (2010).

BOX 12

Case study: Diversifying crops: Uganda

In 2002 Nile Breweries launched the Eagle Project in Uganda for the cultivation and harvesting of sorghum in partnership with Afro-Kai, a seed commodity broker. Afro-Kai provides a variety of grains to more than 8 000 farmers from 26 districts and coordinates production, which requires identification of areas that are suitable for production and easily accessible. It selects the farmers, is responsible for the ordering and supply of inputs, and providing credit to farmer.

After harvest the farmers supply Nile Breweries with their produce at guaranteed stable prices. They are therefore sure of regular and predictable income. The farmers also benefit from the extension services through farmer training programmes and provision of technical advice on all aspects of crop management. The sorghum harvest is more than 6 000 metric tonnes per annum, which injects of over USD 2 million each year into the rural economy in Uganda. The project has increased the confidence of financial institutions to support Uganda's farmers.

Source: Salami, Kamara and Brixiora, (2010).

agencies in collaboration with the three principal farmer organizations (Huner and Romaine, 1999). Licence fees and levees on feed have supplemented research funding.

3.6 CAPACITY BUILDING

Capacity building offers great potential for PPPs (Weirowski and Hall, 2008). Demonstration farms and training centres and programmes can all be run efficiently by the private sector, and if governments wish to privatize public hatcheries these could also be used for training. In addition, ICT could provide e-learning courses for

BOX 13

Case study: Promoting organic catfish: Viet Nam

Viet Nam offers one example in aquaculture. There a partnership between a German fish-importer Binca Fisch, an NGO and the German agency responsible for technical cooperation (GTZ), has promoted organic Pangasius. The private partners shared both risks and costs, with Binca Fisch managing the project. The project has transferred knowledge on organic aquaculture to smallholders in the Mekong Delta and raised awareness of environmental and food safety challenges. The rate of fish rejection has fallen, and European standards on fish quality and working conditions for employees have been met. Farmers can now access European retailers, thereby expanding their market.

Source: Weirowski and Hall (2008).

BOX 14

Case study: Promoting organic coffee cultivation (Uganda)

Uganda (with Kenya) is the leading exporter of certified organic produce in sub-Saharan Africa, with exports dominated by traditional cash crops, particularly coffee. Almost all production is organized through contract farming schemes. Prior to the late 1990s coffee exporters largely relied on the spot market but such procurement led to quality deterioration. With the support of donors, exporters moved to contract farming for some 350 000 coffee smallholders, although there are not always high levels of commitment on the part of buyer and farmers. One of the earliest and largest scheme is the Kawacom Sipi.

The Sipi scheme is operated by Kawacom (U) Ltd., which is the third-largest exporter of conventional coffee from Uganda and the biggest exporter of organic coffee. The scheme project encompassed 3 870 organic farmers in a region in Eastern Uganda chosen for its agroclimatic conditions and because there was no other major buyer. The region had mobile phone access and a new paved road. All farmers within the region could join without cost. About two-thirds of all households in the region are contracted. Farmers within the scheme tend to have larger farms (about a third larger), and have more household labour available than those not contracted. In terms of ages and education there was little difference between contracted and non-contracted farmers: in both groups the farmers' average age was in their mid-40s, with seven years of education.

To maintain certification farms are inspected at least once a year by Kawacom staff. The staff also provide technical advice, run demonstration farms, and monitor farms for compliance with organic practices. These organic practices are specified in the contract. Farmers can sell all they wish at designated collection points providing the produce meets quality standards. If rejected, the produce can be sold off-scheme. The farmer is paid cash on delivery with prices communicated daily by mobile phone through field staff and contract farmers. The contract obliges Kawacom to pay an organic premium if the coffee is "of suitable quality." In 2005 the price premium was about 15 percent. By monitoring through regular farm inspections, providing group training and individual training, and offering a price premium, Kawacom is able to maintain quality standards. It provides very limited inputs. After accounting for the non-randomness of contract farms, those involved earn superior profits over non-contracting farms. The principal reason is the guaranteed price premium if quality standards are met. The guarantee also reduces smallholders' uncertainty. The Kawacom Sipi example illustrates how important the specific design features of a CF scheme are.

Source: Bolwig, Gibbon and Jones (2009a).

BOX 15

Case study: Promoting organic cocoa cultivation: Uganda

Esco Ltd is the oldest of the six companies buying cocoa in the remote Bundibugyo District of Uganda. In 2009 about 15 000–18 000 smallholders cultivated cocoa in the district. After accounting for the potential bias because of the non-randomness of selection, pre-existing, observable farm characteristics, and location, the evidence indicates that contract farming had a positive impact on incomes between 2005 and 2009. Cocoa revenue increased 100 percent compared to non-contracting farmers. The principal reason for the increase was improved post-harvest techniques, which was more significant than the actual price premium. Improved post-harvest treatment of cocoa beans improved product quality, which enabled farmers to obtain the price premium. Of equal interest is the scheme's dynamic impact: improved techniques used by contracting farmers had spillover effects on other farmers. In 2005 only about 20 per cent of contracting farmers fully processed their coffee; by 2009 this had risen to 90 percent. In the case of non-contracting farmers, half did no processing in 2005, but this had fallen to 10 percent in 2009. Low-cost processing has therefore filtered throughout the community driven by the example of contracting farmers, with everyone benefiting from the higher quality (and price).

In the contracting scheme organized by Esco, eligibility to join was determined by agronomic characteristics with zero entry costs. All households in suitable parishes were invited to join, and most did. By 2005 there were 1721 farmers in two adjacent parishes. Company officials trained in organic farming methods provided advice and established demonstration plots in each village to disseminate cultivation techniques. Contracted farmers were required to sell to Esco and follow organic standards; in return they received subsidized inputs. An internal control system was used to verify that standards met organic certification. Initially Esco only accepted cocoa that had been fully fermented and properly dried, offering a price double that of unfermented cocoa.

Between 2005 and 2009, the scheme changed. Farmers who did not sell to Esco were expelled. In addition, the geographical catchment area was expanded in spite of the cessation of donor funding, causing the number of certified farmers to grow to more than 5000 by 2009. Moisture levels were verified scientifically, which generated trust since price was determined by quality. Certified farmers selling cocoa with moisture levels of 5.8 percent received an organic price premium, which declined with higher moisture levels. If moisture levels exceeded 13 percent the cocoa was deemed unacceptable. Farmers outside the scheme faced the same pricing system according to moisture content, but only could obtain the spot price. Between 2005 and 2009 Esco multiplied its purchases of organic cocoa tenfold. The success of the Esco contracting scheme depended in large part on its specific design, and particularly the payment of a premium.

Source: Jones and Gibbon (2011).

entrepreneurial farmers. Private provision of extension services, either fee-paying or by vouchers, can also be an area of PPP.

Improved information and communication can assist farmers with market conditions, and improve the effectiveness and efficiency of technical training, although austerity has reduced the reach of public extension. Data from a survey in Zambia indicated the limitations of public extension: about 77 percent of farmers interviewed had never had access to government extension services (World Bank, 2009). One complement to the public provision of extension is a PPP. Returns can be considerable along the whole value chain, with additional revenue from crops more than compensating for initial investment in only one year (World Bank, 2009). One example of such a PPP

BOX 16

Case study: Determining production and market access for organic cocoa: Sao Tome and Principe

As a result of a lack of knowledge of the cocoa supply chain, in 1990 ; IFAD established a partnership with Kaoka (a subsidiary of a French chocolate producer) to assess the cocoa market. Kaoka decided that Sao Tome and Principe was a good location for the production of aromatic organic cocoa. Kaoka has provided technical assistance and guidance on how to improve cocoa production and strengthen the supply chain with CF, and farmers created a cooperative. The project's aim was a win-win with smallholders obtaining a higher and more stable income, and Kaoka generating a regular source of high-quality organic cocoa.

Source: IFAD (2010).

BOX 17

Case study: Promoting mariculture: the Philippines

This on-going PPP project between Panabo City, fishers associations, cooperatives and other groups, and the Bureau of Fisheries and Aquatic Resources (BFAR) aims to promote mariculture as a major livelihood for coastal fishers. By providing infrastructure and equipment the project should contribute to food security and employment. Private partners will contribute 80 percent of the total investment programme, with investments including mooring systems, physical markers, information, education and communication (IEC) materials and a fish landing centre. The private sector will oversee the upkeep of the facilities. Results so far have been positive with higher profitability for fish farmers, a very significant increase in fish tonnage and more than 500 jobs created.

Source: FAO, 2013c.

is the collaboration between the Syngenta Foundation for Sustainable Agriculture, the Uganda National Farmers Federation, and the Information Communication Technology for African Rural Development, which improved the exchange of customized health and agrolated information between district farmers' associations and farmers by installing village telephones. (Weirowski and Hall, 2008). In addition to technical infrastructure PPPs can assist with physical infrastructure such as harbours, or one-stop service centres for fish farmers.

3.7 FINANCIAL SERVICES

The least common categories among the 25 projects were enhancing credit and disseminating improved seed for the aquaculture industry. As noted above, credit is a major constraint on a smallholder's ability to increase productivity. High transactions costs, lack of collateral and onerous interest rates inhibit rural smallholders from accessing credit. Case Study 1 of Equity Bank and Standards Bank indicate how PPP can provide assistance. Another example is the Global Commercial Microfinance Consortium, which offers credit guarantees from the United States of America for loans to private investment in developing countries.

The following are the most common clauses in agribusiness contracts, such as in poultry and aquaculture farming: 1) general reciprocal obligations: the overall

BOX 18

Case study: Improving inputs: Kenya

Smallholder horticultural farmers in Mount Meru could only sell their crops to local brokers because the exporters who had to satisfy GlobalGAP standards considered their crops unacceptable. The smallholders lacked the knowledge to apply the correct crop protection products, meaning that crops were sprayed erratically and with improper products. The local office of Bayer CropScience saw this problem as a business opportunity that would support its long-term strategy for serving the Kenyan horticultural market. Bayer organized farmers into groups and provided technical advice on the use of pesticides, fungicides and insecticides. Through group purchases these products could be obtained at a discounted price, thereby reducing production costs. Bayer persuaded exporters that the produce would be safe with continued advice and training, and they could return to sourcing the produce from smallholders.

Even so, organic inputs were too costly for many smallholders. Equity Bank saw this as an opportunity to expand its agricultural loan portfolio. The bank negotiated with exporters to handle all crop payments to farmers, which enabled it to deduct input costs prior to settling with farmers. Equity Bank also provided training to farmers' groups on how to budget and plan for the future. To ensure transparency and generate trust, the group keeps detailed records of deliveries and payments, so that farmers can be assured that they are being fairly treated.

Source: IFAD, 2014b.

responsibilities of the contracting partners; 2) specification of the agricultural product to be produced/sold under the contractual obligation; 3) production technology to be used, involving items such as seed variety, soil preparation and cultivation methods, plant or animal disease controls, transportation procedures, storage and quality standards, among others; 4) conditions for purchase, payment obligations, timing and modality of delivery; 5) the system to determine the final prices to be paid to farmers, frequently considering effects of variations in product quality and any applicable loan repayments associated with the provision of inputs or services; 6) choice of a jurisdiction to govern the contract, from the legal standpoint: if the two parties are located in states or municipalities that are not in the same legal jurisdiction, then only one should be chosen to be applied; and 7) reference to a dispute settlement mechanism or to an arbitrator to resolve disagreements, which is always preferable to legal action.

3.8 LESSONS LEARNED

3.8.1 General lessons

- In general, successful projects require good governance with accountability, effective and efficient government policies, and the rule of law. Governments need to build confidence and trust, which demand transparency. When private companies doubt the government's motives (transparency) as well as its capacity to effectively deliver as promised and on time (bureaucracy), then they cannot do business with the government (FAO, 2013c). Over the long term, the success of the scheme will require mutual trust, which in turn depends on accountability, transparency and contract enforcement.
- Projects must also be sustainable so that projects do not become overly dependent on outside support. To be sustainable PPPs and CF must be economically viable, socially acceptable and environmentally neutral. Governments and donors must ensure that the project meets corporate goals of profitability, has

BOX 19

Case study: Poultry equipment: Thailand

Poultry farmers in Thailand used to use open-air feeding houses, rather than air-controlled systems, which are preferable because they reduce stress on poultry and increase poultry growth rates. Closed evaporation systems also address concerns about bird flu outbreaks. As a result, the demand for air control fans rapidly increased, as they reduce the risk of disease. However, the fans were imported, expensive and poorly suited to Thailand. Meanwhile, the National Science and Technology Agency (NSTDA) had offered services and funding subsidies to SMEs in the poultry industry to support the adoption of technologies to improve productivity and save energy. The poultry industry was targeted because it generated export revenue for Thailand. The NSTDA subsidiary that would work directly in the area of new technology adoption in the poultry industry was called the Industrial Technology Assistance Programme (iTAP).

In 2005, the poultry producer Betagro Group capitalized on the opportunity to commission iTAP for the design of new air control fans for its poultry feeding houses. Betagro's machinery subsidiary, B.Inter, worked directly with iTAP on the project. With iTAP's funding and cooperation, experts from a technical university helped B.Inter develop PowerTECH fans. The overall aim of NSTA and iTAP was to enhance the export competitiveness of chicken farming in Thailand resulting from the use of low-cost air control fans. Specifically, iTAP foresaw the following positive effects: more affordable and efficient farm equipment made available for small- and medium-scale poultry farmers; reduced energy consumption (compared with imported models); increased chicken growth rates and, thus, farm incomes; and new employment along the supply chain from manufacturing, distribution and installation. B. Inter's corporate objective was to sell the new fans domestically and abroad. All expert fees and half of the research, development and technology expenses were covered by iTAP with B.Inter paying all these expenses up front. Reimbursement from iTAP would occur upon satisfactory completion of the project. The payment structure was meant to ensure project completion. A generous tax incentive was available to B.Inter for expenses related to research and technology.

In 2009 the PowerTECH fan was completed. PowerTECH fans require 23 percent less energy than competing products and are about 50 percent cheaper than imported alternatives. They also make less noise, thereby easing the stress on chickens. In order to encourage small poultry operations to invest in the fans the company has offered credit for the installation of fans and control systems to contract farmers, who are able to pay later when they obtain benefits from the system.

Source: FAO, 2013c.

community support and will not cause irreversible environmental damage. Only with continuing profitability will CF schemes in aquaculture and poultry be sustainable. To reduce the risks to smallholders, private-sector partners can provide technical assistance and markets. This requires due diligence on the part of all partners and stakeholders.

- Most PPPs are with governments, but some are with donors/NGOs (e.g. IFAD or AGGRA) or with a public agency (e.g. the research organization in Brazil). Even when governments are not directly involved, good governance is necessary if the scheme is to succeed. In most cases governments are actively involved, providing investment funds for the purchase of mills buying land, developing infrastructure and/or providing tax incentives.

BOX 20

Case study: Using PPP as a vehicle to leverage agricultural research (Brazil)

Embrapa is the leading public agricultural research institute in Brazil and has developed partnerships with multinationals for the development of new technologies. With the partner it undertakes research projects that can be used locally. For example, BASF and Embrapa signed a technical collaboration agreement to create cultivars resistant to herbicides. These cultivars will soon be available on the market. Embrapa also provides licences of its technologies to multinationals who pay royalties or a similar fee to commercialize the technology abroad.

Source: UNCTAD, 2009.

BOX 21

Case study: Case study: Increasing rural finance (Kenya)

In this case study, two financial institutions have expanded credit to smallholders in the confidence that it can be a “win–win” situation for everyone; for example, the reduced emphasis on collateral could allow landless young people to participate. The banks charge market rates, but have received support from donors to minimize the risk of credit default. Firstly, donors have provided credit guarantees, and have also provided smallholders with technical assistance to reduce crop failure. The introduction of weather insurance, and lending to groups rather than individuals (by Standard Bank) further reduces risks to the banks. Standard Bank has also actively sought markets for the smallholders.

Two banks have formed partnerships with government agencies and Alliance for a Green Revolution in Africa (AGRA) to ease the lending constraints to smallholders. One bank, Standard Bank, signed a USD 100 million deal in 2009 with AGRA in order to provide financing to small-scale farmers and agricultural businesses in East and South Africa. In the agreement, loans would be available to some 750 000 farmers at prime plus 3–5 percent, with AGRA providing a 20 percent default guarantee on the loans over the first three years. To reduce risks AGRA is training the farmers so that they are better able to use fertilizers correctly and rotate crops, introducing weather insurance through weather-indexed insurance products, investing in seed companies, and organizing small-scale farmers into co-op groups of 500 to 1000 farmers so as to ease farm operations and loan administration. In turn, the Standard Bank has abolished the collateral requirement for loans altogether and has been mobilizing large corporations to commit to buy the upcoming crops. It also intends to use the futures market to set stable commodity prices in advance. Standard Bank is confident that its public–private partnership approach will be a “win–win” solution, turning commercial bank lending to smallholder farmers into a profitable activity.

In Kenya, the Equity Bank began as a microfinance institution in 1984, but has evolved into a publicly listed commercial bank. Through its partnership with AGRA it provides mobile banking services to (both men and women) smallholders and business owners in remote rural areas of Kenya. It charges a small additional fee for traditional financial services. Loans are based on an evaluation of a business’s cash flow, rather than on collateral, and depend on past repayment record. Loans can vary from USD 25 to as much as USD 160 000 or more. With state support, it has expanded its reach to 2.5 million farmers and 15 000 agricultural value chain members such as fertilizer and seed wholesalers and importers, grain traders, and food processors. A “cash guarantee fund” from the state mitigates some of the lending risks.

Source: Salami, Kamara and Brixiora, 2010.

- When governments acquire land for leasing to companies and farmers, the acquisition of land must be done in a transparent manner; if otherwise, the farmers whose properties were “acquired” are disgruntled and start litigation.
- To ensure that smallholders have access to credit, governments or Central Banks can provide loan guarantees. Collateral requirements can also be relaxed, thereby helping young people who may be reliant on renting or leasing land.
- Group, rather than individual lending, can reduce credit default, and discourage side selling.
- PPPs can be used as a strategy of import substitution, or of export promotion. Examples come from the case studies of rice cultivation in Nigeria or oil palm in Uganda. To be attractive to the private sector, import substitution of a staple such as rice may only succeed behind tariff walls (at least initially). The palm oil project has been successful in part because of the strong demand for vegetable oil in Uganda.
- PPPs can be used to introduce new crops or obtain market knowledge.
- PPPs can effectively deploy farmers’ associations or co-ops as intermediaries to lower transaction costs.
- ICT appears to be very effective and efficient in technical assistance and in logistics. The use of ICT may be particularly useful with young people.
- Clustering can lower the transaction costs of agriprocessors. One example is the deliberate and successful policy of concentrating salmon farms and linked activities in Chile. Clustering can, however, create environmental and social risks due to cumulative impacts of many producers in a specified area.

3.8.2 Case-specific lessons

Some lessons learned from agribusiness PPP case studies are:

- PPPs focus on shared interests. Successful partnerships require a sincere belief that the shared initiative is mutually beneficial.
- Successful PPPs require clear identification of roles and responsibilities.
- Timeliness increases the likelihood of success.
- PPP stakeholders should know their markets and set realistic targets.
- PPP projects can be negatively affected by circumstances beyond the control of either (FAO, 2013c).

Enabling environments and good governance are essential for sustainable PPP projects, but there are aspects that are distinct or particularly important for agribusiness and the agro-industries (FAO, 2013c). Examples include: policies, institutions and services relating to food safety regulations; the establishment and enforcement of standards; contract negotiation and compliance; market information and rural transport systems.

The lessons above apply to the four projects in Burundi, Kenya, Rwanda and Uganda. For individual countries, the last point above is particularly relevant in Burundi, where economic and political uncertainty prevail. The implementation of CF and PPP in Burundi will be slower until the political unrest ends, and with continued challenges. One of the reasons is that air transport, which is the main means of transportation for pullet, is not active. Alternative sources of pullet must be found, notably through outsourcing from neighbouring countries such as Congo or Uganda, or through the use of the semi-scavenging model. While it is not advisable to enter a PPP and CF agreement with government officials in the political environment ascertained, the project has mitigated this insecurity by entering into short-term contracts with the government. A challenge that may affect the project’s progress is the uncertainty of private companies, whose stay in the country is dependent on a stable political environment. In addition, a factor that is beyond the control of the project but negatively affects it is weather. In Kenya unpredictable weather, particularly drought,

has affected fish farms and the production of fingerlings. The issue has not only been the quantity of water but also its quality.

Interim reports suggest that timeliness (as noted above) has been a challenge. Communication with companies and government officials has delayed the implementation of certain facilities, and required time-consuming follow-ups.

The projects have also faced the problem of feed, its poor quality and high price. Since feed accounts for more than half of production costs this problem has jeopardized the financial viability of some chicken operations and led to discouragement among some young farmers. This report has provided several measures to tackle this issue. The contract must provide quality specifications and consequences for non-performance where there is breach of these specifications. While enforceability of contractual relations in the absence of a strong legal system is a major problem, contracts (written in the vernacular, with duplicates, and carefully explained) provide clarity, and can prevent misunderstandings.

In spite of these challenges, which are common to all such projects in the early phases of implementation, the chances of success are good overall. Implementation of CF and PPP requires time; young people need time to adapt to the role of entrepreneurs, as well as mature in knowledge and skills, and it is advisable that the project be rolled out in phases. Each phase should have a focus on the progressive development of knowledge and experience by farmers and sponsors. As noted in many projects technical training is necessary, but not sufficient: entrepreneurial motivation must exist, and with it the rudiments of financial literacy. This can come from training and also from interaction with peers, which this project encourages by having young people work in groups. Dissemination of this knowledge and experience was evident with the visit to Uganda of other potential fish farmers from West Africa.

4 CONCLUSIONS

Providing decent work for young people is a priority for Africa given the demographic youth bulge, which is projected to continue for decades. Lack of formal jobs in manufacturing and services suggest that work must be found in rural areas, and agriculture/aquaculture is able to not only enhance incomes but also alleviate malnutrition. This paper explores some aspects of contract farming with public–private partnerships that combine the expertise and profitability goals of the private sector with the enabling policies of governments. The context is sub-Saharan Africa and four countries in East Africa.

Contract farming (CF) has demonstrated its positive impact as an institutional innovation. Even smallholders can benefit: by reducing – if not eliminating – transaction costs, CF provides markets, finance and technology to smallholders. They can be competitive when there are diseconomies of scale in cultivation, but benefits from economies of scale in processing. Partnering with private companies or NGOs can provide time and resources for entrepreneurial attitudes to evolve and for projects to become financially viable. Sustainability requires that farmers and private partners benefit economically and that environmental and social conditions do not worsen.

For projects that focus on food production there are societal benefits. These benefits accrue to society when young people are involved in the project. The extent of unemployment and underemployment of young people in rural sub-Saharan Africa is a personal and societal tragedy, so training and opportunities to engage in business activities is positive. A further societal benefit is the reduction of food insecurity thanks to a successful project. In the first place higher incomes and profits from entrepreneurial activities enhance purchasing power and thus food accessibility. In the second place it increases the availability of food. These benefits are particularly pertinent when a project expands the production of eggs, fish and poultry, given the micronutrients they provide.

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Securing decent work for young people in Africa is critical given the large numbers of young people entering the labour force each year (about 11 million). With few opportunities for formal employment in manufacturing and services, agribusinesses offer young people the opportunity to earn income in rural areas. If others emulate them, there is the potential for positive regional spillovers. One institutional innovation that enables young people to mitigate financial and knowledge handicaps is contract farming.

By supplying their produce to a third party (such as an agri-processor or retail outlet), which in return guarantees markets and often inputs, young workers are able to access credit, markets and technology. This can be a “win-win” solution because young workers gain access to markets, while the private company has access to produce without having to either acquire land or supervise labour. Fiscally constrained governments also benefit because private sector involvement obviates expenditure and reduces risks, and may also provide expertise unavailable in the public sector.

This report presents the lessons learned from a project in four East African countries – Burundi, Kenya, Rwanda and Uganda – focusing on youth and their agribusinesses. In Burundi and Rwanda, poultry and eggs were sold to retailers but were also provided to schools to alleviate malnutrition. In Kenya and Uganda the focus was on fish farming, raising finfish in cages and selling fingerlings. Partnering with private companies enabled young people to obtain business and technical knowledge in addition to a market for their produce.

ISBN 978-92-5-130711-3 ISSN 2070-7010



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CA0134EN/1/06.18