



EXPORT PROMOTION OF
ORGANIC PRODUCTS FROM AFRICA

Household food security effects of certified organic export production in tropical Africa

a gendered analysis



May 2007



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Executive Summary

As organic farming has caught momentum around the world, critical voices have been raised against it arguing that organic conversion could jeopardize food security in developing countries. Yet little empirical evidence has been advanced in support of these claims, while solid evidence is also scarce in support of the counter arguments. In this light the paper examines the effects on household food security of certified organic export production through a gendered analysis. It also discusses how organic conversion affects men and women differently in respect of changes in the costs and benefits of farming.

The paper is based on research carried out in 2005-06 among smallholder farmers in eastern and central Uganda of certified organic Arabica coffee and pineapple, respectively, and among matching control groups of conventional farmers. Both case studies were in the humid tropics. A total of 172 organic and 159 conventional farmers were interviewed in a formal household survey. Nine focus group interviews were moreover conducted with the organic farmers, separately for men and women. Organic production was in both cases organised on a contract farming-type basis, in schemes operated by the firm exporting the organic product and holding the organic certification. The size of the pineapple and coffee schemes was 34 and 3,870 farmers, respectively, and organic certification took place in 2000 and 2004.

Organic pineapple farmers enjoyed high levels of food self-sufficiency and organic conversion did not appear to have reduced food production. This was mainly because the expansion of pineapple farms and their improved management had occurred through additional investment in land and hired labour rather than through the diversion of household resources away from food crops. These positive dynamics were related to the high income earned in pineapple farming as well as to large average farm size. Hence most organic farmers could satisfy their calorie needs through own production and moreover purchase higher value foods such as meat, fish, sugar, tea, and rice. Food purchases ranked only fifth in household expenditures due to the combination of high food self-sufficiency and high cash income.

In the case of organic coffee, the general trend has been a reduction in local food production since organic conversion, mainly due to the expansion of coffee on land previously cultivated with food crops. Very small average farm size combined with low capacity for buying more land meant that the expansion of coffee had occurred at the expense of land planted with especially maize and its intercrop, sweet potatoes. But farmers had adapted their farming strategies in ways that mitigated the intensified competition for land between coffee and food crops. Firstly, while land scarcity had eliminated mono cropping of beans in the area, improved weed management in coffee induced by the organic project had created new opportunities for intercropping beans with coffee. Secondly, some farmers invested coffee incomes in renting land for maize and rice farming outside their home area where land was more abundant. Other causes of reduced per capita food output

that were unrelated to organic conversion included intensified population pressure, declining soil fertility, and plant health problems with cooking banana.

Organic conversion of coffee had also caused a change in the utilisation of family labour, but without seriously impacting food production, it seemed. Farmers had clearly increased their labour efforts in coffee farming and processing. This was due in part to higher and more stable coffee prices and to the stricter quality requirements of the organic exporter. Most of this extra labour was supplied by women who were the main responsible for food production, but because land was the dominant production constraint, this change in labour use did not significantly reduce efforts in food production. Instead, the women had adapted by working longer hours and by reducing the time spent in off-farm activities (reducing their access to personal incomes).

Few organic coffee farmers were self-sufficient in calories and proteins and food purchases thus ranked high in household budgets. This was probably also the situation before organic conversion when land was also a major production constraint. In this context it is worth emphasizing that despite reduced food production after conversion, the interviewees observed that *food security* had not worsened but rather improved. This was because the higher coffee incomes more than compensated for the loss in food production by improving the capacity for accessing food through the market.

Both pineapple and coffee farmers had applied some of the improved farming practices acquired through the organic project on their food crops and there was some reinvestment of organic revenues into food crop farming. In both cases organic certification was associated with moderate increases in production costs. But the benefits of conversion in terms of higher organic crop revenues far outweighed the extra costs, resulting in significant income increases, especially in the case of pineapple.

The effects of organic conversion on gender inequality were mixed and depended to a large extent on the local context and on commodity characteristics. The distribution of the additional costs and benefits associated with organic conversion was much more biased against women for coffee than for pineapple. But it is worth underlining that the interviewed women found that organic farming was well worth the extra work effort due to the income benefits for the household as a whole, even if they had little or no control over the use of this income. The need for gender sensitivity in cost – benefit analyses of organic farming is evident from this study.

The study indicates that conversion to organic export production has not reduced food security in the examined cases but rather improved it by raising cash incomes that have enabled households to increase the amount and quality of food purchased in the market. This suggests the importance of considering changes in capacity to access food through the market as well as through own production when assessing household food security impacts of organic export production. Another insight is that technology and investment spill-overs from the organic export crop to food

crop farming, as well as a more efficient use of available land and labour resources achieved through farmer adaptations, may mitigate the competition over factors of production between food crops and the organic cash crop. In general, where local food markets are functioning and organic conversion does not involve major risk-taking by farmers, the integration of smallholders in international value chains for organic products does not normally constitute a threat to food security.

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1. Introduction

1.1 Background and objectives

Over the last fifteen years the market for certified organic agricultural products has grown from a very low base to reach 1.5-2.5% of total food sales both in North America and the EU, up to 5% in Denmark and Switzerland (Willer & Yussefi, 2006; Oberholtzer et al., 2005; CBI 2005; Financial Times, 2006). Global organic sales were estimated at US\$ 33 billion in 2005, compared to US\$ 23 billion in 2002 (Willer & Yussefi, 2007), representing an increase of 43% or about 14% per year.ⁱ Most of this growth has been satisfied by increases in the area under certified organic production in North America and EU itself. Yet there has been also an increase in certified organic imports into both regions. In the case of the EU these mainly comprise cereals and oilseeds from temperate and semi-temperate countries, but they also include fruit and vegetables (from a much wider range of countries) and tropical beverages.ⁱⁱ

Rising demand both for organic tropical products and for year-round supply of some organic temperate products has encouraged organic activists, NGOs and some donors to promote certified organic export production in a number of tropical African countries. Also several commercial companies, exporters in developing countries, and importers in developed countries have seen the opportunities and embarked on the trade. As a result, the last decade has seen the emergence and rapid growth of certified organic food and beverage exports from Africa.

Evaluations of organic farming in Asia and Latin America found that organic production has a large market potential that can be used in combating poverty in an environmentally sustainable manner (IFAD, 2003; IFAD 2005). In Africa, a recent study of the certified organic sub-sector in Uganda reveals a high performance in terms of growing export volume, revenue and product diversity (Gibbon, 2006) and a similar trend can be observed in Tanzania.ⁱⁱⁱ

But organic export growth does not necessarily translate into improved welfare for the involved producers and workers, whether measured as higher income, improved food security, better health, higher equity or through other variables. Such impacts must be demonstrated empirically at the level of the participating households and their local communities. A review of the economic literature on organic farming in developing countries, including the IFAD evaluations mentioned above, reveals that little research has been done on these important impact dimensions of organic farming (Gibbon and Bolwig, 2007).^{iv} Furthermore, few such studies report quantitative data and even fewer use statistical techniques. Hence observers who claim that certified organic farming improves producer welfare stand on shaky ground.

Against this background a number of studies (including the present one) were recently launched on certified organic production in Uganda and Tanzania, focusing on quantifying the economic and social impacts of organic conversion, but

also addressing organisational, institutional and technology issues.^{v, vi} One of these studies examined the relative profitability of certified organic and conventional farming operations in tropical Africa (Gibbon and Bolwig, 2007). The overall conclusion was that farms that engage in certified organic export production are significantly more profitable in terms of farm income than those that engage only in conventional production.

The present study focused on the non-income effects of certified organic farming, specifically food security and gender impacts. By doing that it seeks to contribute to the debate on how the current rapid conversion of farmland into organic management systems will affect food availability, access and stability in different regions of the world (Sciallaba and Hattam, 2002; WWI, 2006; FAO, 2007). About 850 million people world wide suffer from hunger due to acute food shortages, and 90 % of these are chronically undernourished. These food shortages reflect higher levels of food insecurity and have resulted in chronic under-nourishment which is responsible for high mortality and morbidity rates (UN Millennium Project, 2005).

Against this background the overall objectives of the study were to: 1) examine the impacts of certified organic export crop production on food production and food security at the household level; 2) assess the role of gender in these dynamics as well as how the costs and benefits of organic certification are distributed among men and women. These objectives were sought through two case studies in Uganda of organic pineapple and Arabica coffee farmers, respectively.^{vii}

1.2 Definitions of organic farming and food security

According to the International Federation of Organic Movements (IFOAM), organic agriculture includes all agricultural systems that promote the environmentally, socially and economically sound production of food and fibres (Willer & Yussefi, 2006). These systems take soil fertility as a key to successful production. By respecting the natural capacity of plants, animals and the landscape, organic farming aims to optimize quality in all aspects of agriculture and environment (Ibid). But organic production is not merely concerned with a product, but also with the whole system used to produce and deliver the product to the ultimate consumer, including chain of custody, handling and processing (Scialabba & Hattam, 2002). Within this broad definition, the present study is limited to the production of crops – pineapple and Arabica coffee – destined for export markets and certified by a third party.

According to Gillespie and Haddad (2001), a household is food secure if it can gain access to a sufficient quantity and quality of food for all household members to enjoy a healthy and active life. The term ‘access’ in this definition implies that food may be sourced from one’s own farm, through the market, or through social networks. This study examines mainly the former two potential sources of food, which are the dominant ones in the studied communities. The definition also underlines the fact that food insecurity is experienced by *individuals* within households. In this regard, this study examines how food access (and changes in it) is perceived by both men and women, but we do not attempt to differentiate levels

of food consumption between men, women and children in households. Finally, the study examines changes in the quality as well as the quantity of food accessed by organic farm households.

1.3 Organic standards for primary crop production and processing

IFOAM has developed a set of 'basic standards' for organic production and processing (the IFOAM Norms) that are under continuous development through stakeholder consultations (IFOAM, 2006). In this study we are mainly concerned with the IFOAM Norms relevant to primary producers of crops. These standards are relevant to the study of food security impacts of organic farming because meeting them often requires changes in resource use at the farm and household levels, which in turn may affect – positively or negatively – the ability to produce or purchase nutritious food.

In relation to crop *production*, the following 'organic ecosystems' norms (principles and recommendations) are relevant for this study: ecosystem management (nature conservation, landscape and biodiversity quality)^{viii}, soil and water conservation, general requirements for crop production and animal husbandry, and specific requirements for crop production (choice of crops and crop varieties, length of conversion period, diversity in crop production, soil fertility and fertilization, pest, disease, weed and growth management, and avoiding contamination). In relation to *processing and handling*, the following norms are the most relevant at the level of primary producers: the segregation of organic products from non-organic products, the avoidance of contamination, and the non-use of chemicals in pest and disease control. Aside the organic standards, exporters of the organic products frequently impose production and processing standards relating to physical product quality, which often also demand additional use of labour and/or cash resources.

1.4 Certified organic export production in East Africa

East Africa is at the forefront of developing the potential of certified organic export farming in Sub-Saharan Africa and Uganda is one of the largest exporters of such products in Africa, alongside Egypt and South Africa. In late 2005 there were 14 certified organic exporters in Uganda while a total of 22 companies were expected to be fully certified by mid-2006 (Gibbon 2006). This is a doubling from the 11 certified companies in 2003. The total f.o.b. value of organic exports from Uganda was around USD 6.2 million in 2004-05, compared to USD 3.7 million in 2003-04 (ibid). A significant product diversification has also taken place within the organic sub-sector. In Uganda, traditional cash crops – cotton, coffee, cocoa – were the first to get certification, starting in the mid 1990s, and are still the mainstay of the sector. But since around 2000 certification of higher-value crops has occurred, e.g. fresh fruits and vegetables, vanilla, and spices. In 2006 at least 17 different organic products were exported from Tanzania and Uganda.^{ix} With 40,000 certified organic farms in 2006, Uganda was surpassed in the world only by Mexico and Italy in terms of number of producers, while Tanzania had 34,791 certified farms, and

Kenya 15,815 (Willer and Yussefi, 2007). Still, only 1.5% of Uganda's agricultural land was certified organic (182,000 ha), 0.1% of Tanzania's (38,875 ha), and 0.7% of Kenya's (182,586 ha) (Ibid).^x

1.5 Donor support

A salient feature of organic export operations in Africa is substantial technical and financial support from NGOs and international development agencies. The fast growth in organic exports in East Africa is due in large measure to support given to the sub-sector by the Export Promotion of Organic Products from Africa (EPOPA) programme.^{xi} EPOPA has helped initiate and supported a number of certified organic export projects in the region and in 2006 it was supporting about 16 such projects in Uganda^{xii} and Tanzania, and one in Zambia.^{xiii} EPOPA has also been active in improving the broader institutional environment for organic agriculture, but these activities were not deemed relevant for this study (see, www.epopa.info).

2. Hypotheses on the food security effects of organic export production

Conversion to organic export farming may affect food security for poor people in developing countries through several mechanisms that link organic cash crop farming with household food access (access through own production, social networks or market purchases). In this study we consider the following mechanisms, discussed below: change in crop yield, reallocation of production factors, change in cash crop income, and investment and technology 'spill overs'. Because there are mechanisms with both positive and negative potential effects on food access, and because the magnitude of the effect of each mechanism depends on various contextual factors, the 'net effect' of organic conversion on food access cannot be assumed *a priori*. Among the contextual factors, we give special attention to household gender relations. We also consider the impact of organic conversion on women *per se*.

2.1 Change in crop yields after the adoption of organic methods

One hypothesis to be examined is that a reduction in food crop yields resulting from the reduced use of synthetic inputs will reduce food self-sufficiency in the producing household. Likewise, a reduction in cash crop yields, due to reduced synthetic inputs in both the certified and in other cash crops, will reduce household income, other things being equal (not accounting for the possible reduced production cost and higher revenue effects of organic conversion) and thereby access to food through the market. In developed countries where yields are highly dependent on chemical inputs, most observers agree that organic farming is associated with a decline in yields during the conversion period (Willer & Yussefi, 2006); the disagreement concerns the ability of organic methods to recover yields hereafter. For example, a study comparing changes in yields and soil fertility for

two organic and two conventional farms in Switzerland over a 21 year period, found that the mean organic crop yield was 20% lower than on the conventional plots over this period, while the soil nutrient input was 34 – 51% lower, indicating an efficient system (Mäder et al. 2002).^{xiv}

But if developing countries are considered, organic conversion is likely to have a smaller effect on yields (in food or cash crops) than in developed countries. Firstly, conventional agriculture in developed countries is industrial in character while agriculture in developing countries is generally semi-industrial or non-industrial. This has implications for changes in yields as well as for changes in farmers' outlays on synthetic inputs, when conversion takes place from conventional to organic agriculture in developing countries. It also has implications for the extent to which farmers in the latter region who adopt organic standards really have to adopt a radically new set of farming practices in order to remain economically viable, as they generally have to do in the developed world when synthetic inputs are forsaken. Hence, research from developing countries indicates that organic conversion can actually increase rather than reduce yields (Sciallaba and Hattam, 2002; Gibbon and Bolwig, 2007).

2.2 Reallocation of production factors away from food production

Another hypothesis is that the adoption of an organic cash crop (usually for export) will divert factors of production away from food crop production and thereby reduce food self-sufficiency. This has been observed in some cases for conventional cash crops. But whether this happens in a given situation depends on a range of commodity, agronomic, community, and household factors: **i)** the level of competition for *family labour* between the organic cash crop and food crops (affected by the degree of overlap in peak labour periods and by the ability of the household head to mobilise family labour for the organic cash crop); **ii)** the level of competition for *land* between food crops and the organic cash crop (affected by the land requirements of the organic cash crop, by intercropping options, by available land resources, and by the ability of the household head to mobilise land resources for the organic cash crop); and **iii)** the level of competition for *cash investments* (including for hired labour) between food crops and the organic cash crop.

2.3 Change in cash crop income

Engagement in certified organic cash crop production can improve household food access by increasing household income that may be used to access more food through the market. Organic certification may increase household income either through the organic price premium, by reducing the unit cost of production, or because it enables the adoption of a new cash crop not formerly produced by the household. The little research done to date suggests that organic farmers in developing countries can increase their income by 30%-200% after the organic conversion period (Onduru et al, 2002; Parrot et al, 2006).

2.4 Investment and technology 'spill overs' from cash crop to food crop farming

There are important potential spill overs from organic cash crop to food crop farming that can help raise the food security of organic farm household members. Firstly, income from organic cash crop farming may be reinvested in food production thereby increasing household food supply. They may also be invested in other economic activities (livestock rearing, business, etc) with additional effects on household income, or in children's education that is known to improve food security and child nutrition. Secondly, the technologies and skills acquired through participation in an organic export operation, such as use of biopesticides and organic soil fertility management, may be applied in food crop farming thus raising food crop yields and/or reducing the cost of production.

2.5 Gender issues and impacts

We expect household gender relations to have a decisive influence on how each of the above mechanisms plays out in practice and thereby on the overall effect on household food security of organic conversion. This is because women are often mainly responsible for household food supply, because they at the same time are expected to contribute labour to cash crop farming, and because they often have little control over the cash crop income even if their labour inputs exceed men's.

The study is also concerned with the impact of organic conversion on women as a social group (gender equity). The empowerment of women is generally important for increasing agricultural food output and distribution and for raising the level of nutrition in rural populations. Madeley (2002) and Blackden *et al* (2006) have shown that when women have access and responsibility over productive resources such as land and labour they have greater capacity to optimize their use, thereby increasing the amount and nutritional value of food grown. Along this line of thinking it has been argued that the involvement of women in organic agriculture has a positive effect on their empowerment (Willer & Yussefi, 2006) with related nutritional and health benefits. Firstly, organic farming often involves the diversification of both plots and crops and this may allow women to play more diverse roles and assume more responsibility in the household economy. The added decision-making power in turn increases their self-esteem and enhances their status within the family and the community. Secondly, the diversification of diets associated with a more diverse cropping system enhances child nutrition and improves the management of childhood illnesses (Rosegrant et al, 2005). Thirdly, because organic farming requires specialized knowledge and skills it gives women more opportunities for educational development. However, while such gender-related benefits of organic farming are indeed plausible, it is important to note that robust empirical evidence in these areas is scarce.

3. Research Methods

3.1 Case selection

The study builds on case studies of two certified organic export schemes in Uganda, the Sipi Organic and Utz Kapeh Arabica Coffee Project operated by Kawacom (U) Ltd and the Luwero-Kayunga pineapple scheme operated by Biofresh (U) Ltd. In 2005-06, when fieldwork was conducted, these schemes had respectively 3,870 and 34 members.^{xv} While the organic coffee scheme enrolled all coffee farmers (other than those opting out) living within physically continuous areas, the pineapple scheme recruited by a mixture of farmer self-selection and selection by company staff. The coffee scheme employed locally based staff trained to provide an organic extension service, while the pineapple scheme used a field officer based in Kampala with professional training in agronomics. Both schemes operated through 'contact farmers' selected from local community leaders. In each case, a limited range and number of inputs were provided free or at cost, mainly but not exclusively to contact farmers. Both schemes received support from EPOPA for feasibility studies, farmer registration, certification, and training and marketing, although there are difficulties in quantifying the precise value of the support received and the extent to which different cost components were covered.^{xvi} The pineapple scheme also received a small amount of support from another donor. Both schemes were certified compliant with the EU organic regulation 2092/91 and the coffee scheme was also certified to the Utz Kapeh sustainability standard.

3.2. Methods of data collection

Four sources of information were used: household surveys of organic and conventional farmers of coffee and pineapple, focus group interviews of separate groups of male and female organic farmers, interviews with executives and staff of the export companies, and project documentation availed by the export companies. The household surveys were carried out between November 2005 and April 2006. The data sets for pineapple and coffee include: i) a sample of 32 organic pineapple farmers (Biofresh outgrowers) in Luwero and Kayunga districts and a control group of 32 conventional farmers; ii) a sample of 114 certified organic Arabica coffee farmers (Kawacom outgrowers) in Kapchorwa district and a control group of 97 conventional farmers in Kapchorwa and Sironko districts.^{xvii} Focus group interviews were carried out in October 2006 and focused on topics relating to food security, gender, and the distribution of benefits among scheme members. In the coffee case we interviewed five groups of Kawacom outgrowers: two female and two male groups (in each case, one group of 'small' and one group of 'large' farmers), and one group consisting of farmers known to sell only a small part of the harvest to Kawacom (this interview focused on causes of side selling). The groups were identified by the Kawacom field officer. The age of the interviewees ranged from 18 to 70 years. In the pineapple case we also conducted interviews with two male and two female focus groups, one of each in Luwero and Kayunga districts, respectively. The interviewees were selected by the Committee Chairman in each district at the request of the Biofresh Purchasing Coordinator. Each focus group

interview took 2.5 - 3.0 hours. Interviews with organic project staff were done before and after the household surveys. Both types of interviews were used to validate the results of the household survey. The latter was designed in part based on interviews with organic farmers and project staff.

4. The supply chain for organic pineapple

Relatively high overland and sea freight costs as well as long transportation time means that Uganda can only compete in the “air-freight organic” market for pineapple in the EU. Only in the organic market segment is it possible to cover the cost of air freight; an additional selling point is the superior taste that comes from the pineapple ripening on the plant, which is only possible to capture using air freight. African exports of conventional pineapple to the EU (by sea) are dominated by Ivory Coast, Cameroon and Ghana, in that order.^{xviii} West Africa has much lower air freight rates to the EU (\$1.0-1.2 per kg) than Uganda (\$2.0-2.2 per kg) but West African pineapple producers only make limited use of this cost advantage to compete in the EU organic pineapple market. Instead they exploit the relatively low sea freight costs to export large volumes of conventional pineapple to the EU.

4.1 The Biofresh organic export operation

Biofresh began operations in 2004 and exported its first organic produce in September that year. It is a local company jointly owned by the Kenyan director and a German importer, Kipepeo. Biofresh exports only organic products (pineapple, apple banana, passion fruit, ginger, papaya, and avocado) and all is sold to Kipepeo. The latter in turn supplies 20 - 30 clients in Germany. In the second half of 2006 Biofresh was exporting 20 - 25 tons of fresh pineapple per month. The variety sold is Smooth Cayenne. (In the EU market for conventional pineapple the most common variety is MD 2, which is said to be sweeter and have a more attractive colour than Smooth Cayenne.)^{xix} Aside the organic certification, a key selling point of Biofresh pineapples is that they are almost ripe when picked, which, it is argued, gives them a better taste than if ripened during transport and storage (which is the norm in both the conventional and organic market). In September 2006 Biofresh started the production of dried organic pineapple for export, in rented premises. The first order was for 3 tonnes.

Quality criteria for organic pineapple

The export size standard for organic pineapple is 1.0-1.6 kg. The fruit must moreover be two-thirds ripe, clean, insect free, undamaged, and harvested with knife leaving a stalk of 1-1½ inch on the fruit (this reduces fungus attack and damage during transport) and the crown. As described below, most of these quality attributes are checked at least three times before the pineapples leave the country - by the farmer, by the Biofresh buyer in the field, by Biofresh during export packaging, and by phytosanitary inspectors at the airport.

Social development support and credit provision

Each year the German importer (via Biofresh) funds social development projects in the outgrower communities such as packing sheds and water pumps. Biofresh provides a limited amount of individual loans that rotate among the farmers in a grower group (this system was chosen to create group pressure to repay the loan). Biofresh has applied for Fair Trade certification but did not qualify since only farmer groups can hold the type of certification applied for (and only some of Biofresh's farmers belong to such a group – see below).

External support

Biofresh has received support from EPOPA since it started its organic operations in 2004 and the support continued in 2006. The support has mainly been in the form of technical training of farmers and field staff, promotion of grower groups, establishment and back stopping of the internal control system, financial support to third party organic certification, and marketing (market information, training in market feasibility studies, trade fair participation, company promotion, market partnership linkages, and website development). EPOPA has also supported the trial shipment of refrigerated containers to UAE and Europe.

4.2 Recruitment of outgrowers

In 2006 Biofresh had just over 100 registered outgrowers, supplying the company with pineapple, apple banana, passion fruit, ginger, papaya and avocado (supplied by three 'product' farmer groups' – pineapple, passion fruit and apple banana). About 34 outgrowers specialised in organic pineapple production. Of these, about 22 were scattered around the village of Lusanja in Luwero district and about 12 in villages between Kayunga town and Kangulumira town in Kayunga district. In late 2006 an additional 9 pineapple farmers were certified in Masaka district. Biofresh pineapple out growers in Luwero were all members of a local organic farmers' association, which had been set up by one of the Biofresh shareholders together with local pineapple farmers in 2003. The association's members were mostly the best established pineapple farmers in the area. In contrast, Biofresh out growers in Kayunga had been recruited at a later stage and on an individual basis by a company staff member. These farmers were mostly located on the fringes of the main (conventional) pineapple belt in Kayunga and were mostly markedly less 'established' than Biofresh out growers in Luwero.

4.3 Procurement and export shipment

Procurement is organised through a farmers committee (farmer group) in each district. Biofresh collects the produce on a weekly schedule at the 'buying centres' of each committee. The size of the weekly order from Kipepeo determines the amount procured from the outgrowers. Biofresh gives these orders to the chairman of each committee (the contact farmer) on Wednesdays by cell phone. The pineapples are then collected in a rented truck on Thursdays or Fridays. The farmer sorts the pineapple at his homestead or at the buying centre and packs them in boxes of six. At the buying centre the Biofresh buyer, assisted by committee members, controls the quality and marks the boxes with the farmer's code. The

latter is done to trace the origin of the fruit to the individual certified farm (a key requirement of organic certification) and may also be used to identify farmers who deliver sub-standard pineapples. The fruits are then brought to the Biofresh premises in Kampala for final sorting, cleaning and packaging before they are packaged for export. About 5-10% of the fruits are rejected during this second sorting.

The fruits are transported to the airport some 30 km away on Saturdays or Sundays and placed in a cold store (the freight cost covers this service) before loaded onto the plane Sunday night or Monday morning. The import destination is Frankfurt Airport, which is reached via London (if British Airways) or Dubai (if Emirates). The pineapples reach the shelf around Tuesday implying a 'field-to-shelf' time of 4-5 days. Biofresh is paid by the importer 1 - 3 weeks after delivery. The importer pays for the cost of air freight.

The official export procedures were simple and low cost. A phytosanitary certificate must follow each export shipment and is issued upon successful inspection by Ministry of Agriculture (MAAIF) officials at the airport. The inspectors check for insects, damage to fruits, scales, correct labelling of packaging, importing firm and country. The inspection is free and Biofresh rarely has problems during these inspections (in their own words because they put a lot of effort into cleaning and sorting before final shipment). Corruption is not a problem. A EUR 1 movement certificate is also required for each shipment. It states the content of the shipment, which must tally with the invoice.^{xx} Finally, an organic transaction certificate is issued by IMO directly to the importer although BIOFRESH is paying for it.

Biofresh maintains an 'export delivery list' for each shipment that specifies the amount delivered by each farmer of each product, the export price per kg, and the total revenue in USD. These data are aggregated for the financial year (1 October - 30 September). Another list states the amount delivered for in each shipment by the importer to each final buyer.

Seasonal supply problems

While the growers produce many more 'export size' pineapple than Biofresh will buy during most of the year, supply problems are sometimes experienced in the low seasons, i.e. March - April and September - November. Serious supply problems were experienced for the first time in 2006. To help stabilise supply, Biofresh therefore certified a new group of organic pineapple farmers in Masaka district, where the peak season falls at a different time due to the location of the district south of the equator. The scattered distribution of relatively few growers in three districts is related to the need to secure a reliable supply, but it does imply higher costs of procurement and monitoring.

Distribution of orders among farmers

Limited export orders mean that Biofresh has not committed itself to buying a fixed or minimum amount of pineapples from its growers. Because of seasonal yield variations and a general high production capacity, farmers often have more pineapples on sale than Biofresh is willing to buy. Hence the issue of how orders

are distributed among growers arises. It is the prerogative of the farmer committee, and most especially the chairman, to distribute the orders among the growers. This is in principle done based on an assessment of each grower's supply capacity in the given week, concerning which the growers have informed the chairman on the collection day of the previous week. Acreage is the general framework criteria applied. This system appeared to function generally well, although there were problems. In the peak season when supply outstrips demand, some farmers complained over an unfair distribution of orders, but it was not clear what caused this bias. Secondly, because orders were allocated to the household as opposed to individual growers, married women who operated their own pineapple plots were placed in an unfavourable position and some felt that their allocated share was too small (and that they could not do anything to change this). Female headed households may also have been disadvantaged. While the interviewed men insisted that the allocation of orders was not gender biased, some women felt unfairly treated in the allocation of orders. One reason may be that women rarely attended the weekly committee meetings when orders were allocated, but got the information later from the chairman.

Sale of excess harvest

Biofresh growers sell their excess harvest to traders in conventional pineapple who supply the local and regional markets. About 76% of the organic pineapples are sold through these market channels (Gibbon and Bolwig 2007). Because of the technical difficulties of producing half-ripe pineapples that meet the narrow export size range, it is unlikely that organic pineapple production would be profitable without these alternative market outlets. The quality demands in the two types of markets are moreover to a large extent complementary, since the fruits that are too large for export fetch the highest prices in the local and regional markets. Most regional exports go to Kenya and Rwanda, and intermittently to southern Sudan. This trade appears to be growing and Biofresh is facing increasing competition from traders supplying these markets, especially in the low season. Farmers rarely sold export size pineapples to the local and regional traders.

4.3 Pineapple production

Outgrower capacity and income^{xxi}

All Biofresh growers are located in areas receiving bimodal rainfall, which is a suitable regime for pineapple growing under rainfed conditions. The altitude is about 1200 m.a.s.l. Production takes place in three different areas, which to some extent helps stabilise supply. In 2005 each organic farmer had on average around 30,000 plants and harvested a total of 11,000 pieces of pineapple (Gibbon and Bolwig 2007). The average whole farm size was 3.5 hectares (ibid). The size of the pineapple plots operated by the farmers interviewed in the focus group interviews ranged from one to five acres. Most had some experience in pineapple production, ranging from 4–18 years.

The household survey revealed that organic farmers produced on average twice as many pineapples than their conventional counterparts (11,055 versus 5,362 per

year).^{xxiii} There are two main factors underlying the relatively high production capacity of organic farmers. Firstly, focus group interviews suggest that many organic farmers in recent years have invested heavily in expanding their pineapple enterprises due to better and more stable prices (a result of an organic premium and expanding regional markets) and due to the simultaneous loss of coffee and banana as major cash crops (mainly as a result of disease). Secondly, due to the way Biofresh recruited farmers for organic certification (through a self-selected farmers association in one district and 'hand picking' by company staff in another) the capacity for undertaking such investments is likely to initially have been above average (although the household survey revealed no significant differences in factor endowments between organic and conventional farmers).

Despite the organic price premium for export size pineapples, the average price received per pineapple was only slightly higher for organic farmers than for conventional ones (and the difference was not significant (possibly due to low sample size)). This was due to the fact that 76% of the organic pineapples (most of non-export size) were sold in the conventional market. Organic farmers earned significantly higher revenues from pineapple sales than their conventional counterparts (UGX 3,835,500 in 2005, versus UGX 1,824,345). The key factor here was volume rather than price. Focus groups likewise revealed that organic farmers had experienced a large increase in pineapple revenues in recent years, due to expanded production and to higher and more stable prices (related to organic premium and possibly to growth in regional demand).

Key management practices in pineapple farming

Interviews with Biofresh staff and outgrowers revealed that spacing, intercropping, weeding, mulching, and field rotations are critical operations in pineapple production. Spacing directly determines plant population per unit area and in turn yields. Organic farmers have also reduced plant spacing in order to achieve the small fruit size required by the export market. Intercropping is especially important in the present context of expanding export production because it enables households to continue food production within the pineapple farm in the first one or two years. Where the intercrop is a legume (e.g. beans, groundnuts, cowpeas, mucuna) it also helps improve soil fertility through nitrogen fixing. Clean weeded fields produce tastier pineapple fruits, better quality fruits due to reduced pest and disease infestation, and enhance yields through reduced competition for nutrients and moisture. Low soil fertility was a general problem and especially in Kayunga where the intensity of land use was very high. Here the application of coffee husks was a critical (and expensive) part of establishing a new pineapple plantation. Crop rotations were used in both Kayunga and Luwero. The general rule is that pineapple plots should be rotated every 5–7 years to avoid nematode infestation and soil nutrient depletion.

Adoption of organic methods and 'good farming practices'

The Biofresh outgrowers have been trained in a number of improved management practices. EPOPA has conducted most of the training as part of its support to Biofresh, but Biofresh has also hired NOGAMU and individual experts at its own cost. The Biofresh Production Manager has also trained the outgrowers and has

participated in several training courses organised by EPOPA.^{xxiii} The management practices taught to the outgrowers concerned both organic methods and 'good farming practices': land clearing, land preparation, planting methods, use of appropriate varieties, field crop rotations, use of biopesticides and other non-chemical pest controls, soil and water conservation, soil fertility management (mulching, animal and compost manure, coffee husks), harvesting with a knife (as opposed to breaking the stem), and other methods (weeding, "earthing up", cutting old stems, spacing, intercropping). According to household survey data, the most significant differences between organic and conventional pineapple farmers in respect of the rate of adoption of these practices were the use of animal manure, biopesticides, and harvesting with a knife (Gibbon and Bolwig 2007).

The focus group interviews showed that organic conversion has caused several changes in pineapple management practices. The most important among these are listed in Table 4.1. A female group suggested that weeding was the activity where the work load had increased the most since organic conversion, followed by planting in rows. No other groups made such a ranking, but the general impression was that increased time spent in weeding was the biggest change in management in terms of cost (of family labour or cash inputs). More judicious weeding was perceived to benefit both the yield and quality of pineapple, and while clean weeded fields is not an organic standard, it was vigorously promoted by the Biofresh Production Manager due to its perceived positive effects on fruit quality. Another important change was reduced spacing, which was done to increase the proportion of fruits of export size. This practice had generated costs in terms of making weeding more time consuming and reducing the available space for intercrops. Harvesting with a knife and leaving 1 - 1.5 inch of the stem on the fruit was required by Biofresh because it reduces fungus attack and to a smaller extent bruising during transport. This practice involved higher labour inputs compared to the traditional method of breaking the stem. Most other management changes also involved more inputs of family or hired labour, as discussed further below.

Table 4.1. Changes in pineapple management practices after organic conversion

Change in pineapple management practices after organic conversion	Main reason for change	Cost implications
More weeding with hand.	Closer spacing inhibits use of the hoe for weeding.	More family and hired labour.
More frequent weeding – about 6 times a year in young fields.	Export quality requirement (better taste, more uniform ripening). Higher yield.	More family and hired labour.
Reduced spacing between plants.	Produce smaller fruits of export size.	More family labour (derived effect).
Harvesting with a knife, leaving an inch of stem on fruit.	Export quality requirement (reduces damage under transport).	More family labour.
Increased use of organic fertilisers – animal manure, coffee husks, and crop residues (bean leaves).	Recommended by Biofresh, approved by certification bodies.	More family labour. More cash for purchasing and applying coffee husks.
Increased use of organic pesticides (mixes of cow urine, chilli, ash, chicken waste) against nematodes in banana.	New practice taught by Biofresh	Not significant, but mainly done by women.
Planting in rows and measuring spacing.	Biofresh requirement.	More family labour.
More use of legumes as intercrops.	Recommended by Biofresh, approved by IMO, the organic certification body.	Cash required for seeds.
Reduced number of intercrops within pineapple.	Result of closer spacing.	Lower yields of intercrops.
More careful transportation and sorting. Longer transportation of fruits.	Export quality requirement. Farmers bring the pineapple to the central collection point where Biofresh buys the fruits. (When pineapple is sold to local (conventional) traders, the latter traders collect the fruits in the field.)	More family and hired labour.
More frequent and better timing of field rotations.	Biofresh recommendation. More constant planting means more constant production (stability of supply).	More land for pineapple. More family and hired labour for clearing and planting. More cash to buy suckers.

Source: Focus group interviews in Luwero and Kayunga, October 2006.

Cost implications of changes in management practices after conversion

The interviewed outgrowers all agreed that organic conversion has significantly increased the cost of pineapple farming and that they face higher costs than conventional farmers. Costs referred to both cash outlays and family labour inputs. Below we discuss how organic conversion has affected the Biofresh outgrowers' cash expenses on hired labour, land, and organic fertilization (coffee husks). These items together accounted for 91% of their fixed and variable costs (excluding family labour) in 2005, which averaged a total of UGX 438,000 (USD 236) (Gibbon and Bolwig 2007). The latter is a high figure by Ugandan smallholder standards and shows that access to cash was a key factor in organic pineapple farming (and pineapple in general).^{xxiv} The revenue from pineapple sales were much larger though and ensured the organic farmers an average farm income of around 3,700,000 (USD 2000).^{xxv}

The focus group interviews revealed that a major cause of the increased cost of organic conversion was increased labour inputs, especially weeding labour. Hired labour performed between 25% and 50% of the weeding in pineapple and farmers also hired labour for mulching, planting and harvesting. The household survey showed that hired labour was the biggest single cost item in organic pineapple farming, accounting for 34% of all production costs (fixed plus variable) (Ibid). This means that the introduction of more labour intensive management practises is likely to increase cash expenses in pineapple farming quite significantly. Consistent with these observations, the farmers observed that organic conversion has led to an increase in the amount of labour they hire. Increased hiring of labour has coincided with (and has possibly contributed to) a substantial increase in the unit cost of this labour, thus further increasing the cost of organic farming.^{xxvi} Increased wage costs have also increased the cost advantage of being a conventional farmer whose farming methods are less labour intensive. While organic farmers did not use herbicides before conversion, this practice has subsequently spread among the conventional farmers, according to the interviewed Biofresh farmers. If it is true, as claimed by the latter, that the use of herbicides is a significant saving in weed control compared to weeding by hoe and hand, this would have preserved differences in labour costs in favour of organic farmers. We do not have reliable data to verify this, however.^{xxvii}

Land purchase and rental was the second biggest cost item in organic pineapple farming, accounting for 30% of all production costs (Ibid). The focus group interviews revealed that favourable and stable prices for pineapple, possibly a result of both organic and regional exports, had provided both the means and the incentives to invest in the expansion of pineapple plantations. Another important factor has been the substitution of pineapple for coffee and cooking banana, both of which has suffered serious disease attacks, as the major cash crop. In this context of general expansion, the additional need for land to practice improved crop rotation is probably of minor importance.^{xxviii}

The third biggest cost item was the purchase and transport of coffee husks, accounting for 26% of all production costs (Ibid). Coffee husks are used as mulch and are a critical input during the establishment of new plantations. Farmers also

applied coffee husks before organic conversion, but they have intensified its use due to improved price incentives, according to some of the interviewees. Few farmers can afford to apply the recommended amounts, however, and the price of husks has increased in recent years, due in part to the reduction in local coffee production.

Meeting organic standards: farm inspections and control of origin

A key element in the Internal Control System (the set of procedures and documentation required for organic group certification) was the annual or semi-annual inspections of each outgrower by the Biofresh Production Manager ('internal inspections'). But for Biofresh these farmer visits had the additional objective of 'building a relationship' with its suppliers and some farmers were visited up to six times a year. Specifically, the farm visits served as an occasion for giving technical advice, for discussing the farmer's problems, and for 'encouraging' the farmer to deliver the amount and quality of pineapple that Biofresh needed. Securing the supply was especially critical during the low season of 2006 when Biofresh, faced with increased competition from local traders supplying expanding regional markets, encountered problems of filling its orders for fresh pineapple as well as securing a supply of bigger pineapples for drying. Focus group interviews revealed that it was most often the men who met with the Biofresh inspector, except in case of female headed households, but that women were also invited to and attended the group trainings. Since men performed most of the work and management functions in pineapple, this 'gender bias' did not appear to seriously impact on outgrower performance.

Biofresh used IMO as the third-party organic certifying agency. During the annual inspection, the IMO inspector visits selected outgrower farms as well as inspects the documentation produced during Biofresh's own farm inspections. According to the Biofresh Production Manager, IMO's most common production-related critiques have been these: 1) there are not enough trees in the pineapple fields. Faced with the argument that shade has a negative effects on the taste, colour and size of pineapples, and reduces the resistance to disease, IMO has agreed that trees can be planted on field boundaries and that there should be at least 10 trees per acre. 2) Farmers do not make soil bunds before planting. The farmers in turn have argued that this would be double work since ridges are formed as they make the rows between the pineapples. 3) Inadequate use of intercropping and of cover crops like velvet beans and jack beans. In the latter case, farmers lack access to seeds. In the former, it is likely that less space has become available for intercrops after the spacing of pineapple has been reduced to get more fruits of export size.

There were also procedures for controlling that the fruits sold as organic also came from the certified organic outgrowers. The key tool was the comparison of the export delivery list, which states for each shipment the amount marketed by each grower (amount sold to Biofresh less rejects), with an estimate of the production capacity of each farmer. The latter was updated annually during the internal inspections by the Biofresh Production Manager, based on his observations of acreage, number and age of plants, and yield.

Meeting export quality standards

At the time of study, two years after the first organic delivery, some of the outgrowers sometimes failed to meet the export quality standards. Some farmers mixed all sizes in the boxes and some delivered low-quality and bruised fruits. Such actions also meant that the delivery of a farmer fell short of the agreed amount. The technically most challenging standard for the farmers was producing half-ripe fruits of relatively low weight (1.0 – 1.6 kg). The pineapples rejected by Biofresh at the buying point were sold to local traders.^{xxix}

5. The supply chain for organic coffee

5.1 The Kawacom organic coffee export operation

Kawacom is one of the largest exporters of conventional coffee from Uganda and the biggest exporter of organic coffee. It operates the Sipi Utz Kapeh and Organic Arabic Project in Kapchorwa district as well as two other organic coffee projects in Uganda. Kawacom is a subsidiary of the international trading house Ecom Agroindustrial Corporation, based in Switzerland. The Swiss office supplies green coffee to markets in Europe, while the speciality market in North America is served by Atlantic Speciality Coffee which is also part of the Ecom Coffee Group. ASC is certified by the main organic certification body in the United States, OCIA. Ecom thus controls large parts of the supply chain for organic coffee: from a detailed specification of the production practices to be followed by its growers, to the wholesale of green coffee in the major consuming regions. Being part of a large group of companies specialised in coffee, Kawacom is likely to enjoy economies of scale in marketing and related activities (e.g. in accessing trade finance) compared to single-firm coffee exporters in Uganda.^{xxx}

External support

The Kawacom Sipi project received support from the EPOPA programme during the first three years of its establishment, but has since 2005 operated entirely under commercial conditions. Three types of support were given: payment for third-party organic certification, design and adaptation of an internal control system required for this certification, and development and promotion of organic methods and 'good farming' practices. The latter involved support to demonstration plots and to tree nurseries as well as to technical training of field staff. A Dutch consultancy company (AgroEco) provided this assistance, while a Swedish consultant (Grolink) provided assistance on marketing. After the EPOPA support ended, Kawacom has continued to hire at its own cost the services of the consultant who designed the internal control system and trained its field staff in organic methods.

5.2 Recruitment of outgrowers

The Sipi project operates in parts of Kapchorwa District on the northern slopes of Mount Elgon in eastern Uganda. Farms are situated between about 1650 and 2150 meters above sea level, which is suitable for Arabica coffee. At the end of the 2005/06 season the project encompassed 3,613 organic farmers, plus 103 in

conversion, in 201 villages. The first farmers were organically certified in 2000 and most others in 2001. In 2003 all organic farmers were Utz Kapeh certified. There were no barriers to project entry at the initial registration (except for location within project area), and as a result a large proportion of coffee farmers in the project area is certified (62% of all households). Farmers who did not register at first were not allowed to join until 2005-06 when Kawacom recruited new growers from parishes adjacent to the project area. These growers were first certified to Utz Kapeh standards, for which there is no conversion.^{xxxi} The area was chosen due to its favourable agroclimatic conditions and because of a weak presence of the then dominant buyer in the Mt Elgon region, Bugisu Cooperative Union. In 2003 a new tarmac road very significantly improved accessibility and a mobile phone network was established around 2000. This made procurement easier but at the same time intensified the competition for coffee from other traders.

5.3 Procurement and export shipment

Kawacom collects the coffee from its organic growers in a small truck and stores it in a rented store situated within the project area. The truck operates only during the main coffee buying season when it passes designated buying points on a regular weekly schedule. Farmers may also deliver the coffee directly to the store, which is also open only during the main season. The coffee is most often carried to the store or collection point as head load by women, accompanied by their husband (who sells the coffee). The farmer is paid in cash at delivery and gets a receipt. The coffee is milled (from dry parchment to clean coffee) at a rented factory in Mbale or transported directly to Kawacom's designated organic coffee factory in Kampala. Colour sorting, hand sorting, and export grading is done in Kampala. Export shipment is by truck from Kampala to the port of Mombasa.

Kawacom procured 513 tons organic parchment coffee in Kapchorwa in 2004/05, equivalent to 133 kg per farmer (although 56% of farmers did not deliver any coffee that year). In 2005/06 the figure had increased to 715 tons (198 kg per farmer). The increase according to Kawacom staff was due mainly to a lower incidence of side selling off the project after an intense 'sensitisation campaign' and a stronger involvement of the local field officers in the buying operation.

Organic and export quality standards

The organic farmers are required to follow certain production and on-farm processing practices, which are specified in the grower contract issued to each farmer by Kawacom. These practices follow the standards for organic and Utz Kapeh certification or are practices known to improve the physical quality of coffee beans in terms of moisture content, appearance, size, and aroma. Some of the standards are not fully specified in the contract but are elaborated in the project's Internal Control System (ICS). Kawacom buys only 'parchment' coffee from its outgrowers. Parchment is coffee beans whose pulp has been removed through wet-processing (pulping) and subsequent fermentation and sun drying, leaving a thin layer around the bean, the husk, which is removed industrially by the exporter. The coffee delivered by the growers must moreover meet the following quality standards: it must have a moisture content of 13% or below (verified by a meter); it

must have been dried on clean surface (tarpaulins or trays, although most farmers use polythene sheets); it must have undergone proper fermentation (verifiable by bean colour and smell); and black pods and extraneous matter must have been removed through sorting. The most common reasons for rejecting coffee offered for sale by a grower is excessive moisture and foreign matter content. In such cases the farmer can reprocess the coffee and sell it later, or he may sell it to middlemen.

Six different means are employed to enable or induce farmers to meet the quality and organic certification standards specified in the grower contract and project ICS: 1) technical training and provision of related demonstration sites; 2) input provision (albeit on a limited scale); 3) farm inspections to control for contract violations and to give individual advice on how to improve performance; 4) a policy of rejection of all sub-standard and (suspected) non-organic coffee enforced through controlling bean quality and origin at the time of purchase; 5) a price premium for organic coffee; 6) a procedure for evicting farmers who consistently or grossly violate project standards and rules (although no farmers had been evicted for these reasons at the time of interview).

There was general agreement that coffee grown by the organic farmers was of a significantly better quality than other coffee grown in the area. According to Kawacom staff, the superior quality attributes of the organic coffee are:

- The out-turn from factory milling and sorting is higher – 82% compared to 76-77% for conventional coffee.
- The moisture content is lower.
- Better appearance – it is cleaner and there are no black pods (these are removed by the farmer before delivery). Absence of black pods also makes milling cheaper.
- There is a lower incidence of bad smell, caused by over-fermentation and poor drying.
- Favourable 'cup' characteristics – strong flavour, strong body, and high acidity.

Control of origin

Because traceability is so fundamental in the organic market, the most important condition in the contractual arrangement between farmers and Kawacom is that the coffee sold to Kawacom is genuinely organic. An elaborate Internal Control System is implemented to ensure and document that the contracted farmers follow the principles and practices of organic production. The contract is likewise quite detailed on the prescribed organic practices. The contract does not mention that an organic farmer is not allowed to sell conventional coffee as organic, but the Internal Control System has a simple procedure to control for the adulteration of organic coffee by produce from non-organic farmers. An estimate of each farmer's production capacity is made each year based on the number trees and a standard yield estimate.^{xxxii} At the time of buying, the quantity delivered by the farmer is then compared against the estimated production capacity. When a farmer has filled his 'quota', which is very rare, he can sell the excess coffee to middlemen at a lower price. Regarding the problem of segregation of organic from conventional coffee, the contract mentions that the farmer must 'pulp coffee only from other contracted

farmers' but it does not include other farm-level requirements such as separate storage or clear marking of bags. The scarcity of pulpers makes it difficult for farmers to control segregation during pulping. Yet since the vast majority of farmers in the project area are organic, the risk of adulteration of organic coffee at the farm-level appears small.

Organic price premia and local price 'spill over'

The grower contract obliges Kawacom to pay an organic premium if the coffee is 'of suitable quality'. The size of the premium is not specified. The organic buying price is communicated daily from the Kawacom Kampala office to the organic branch manager. Farmers get this information through the field officers and contact farmers. Kawacom has never directly negotiated the price with their growers, but the latter frequently complain to Kawacom about low prices and the field officers monitor the price offered to the organic farmers by local middlemen. The latter are willing to pay a premium for the higher quality of organic coffee which they use to mix into lower-quality coffee bought from other farmers. And because organic farmers are free to sell their coffee to off-project, Kawacom must compete on the price with middlemen for the organic coffee. The difference between the price offered by Kawacom and by middlemen for the same quality is at times very small, as illustrated by the price movements in 2005/06 (September to February). At the beginning of the season the organic price was UGX 2350/kg, which was only slightly higher than the local price of UGX 2300. Towards the end of season the organic price reached UGX 2650 while conventional buyers offered UGX 2450.^{xxxiii} Thus while the organic producer price depends mainly on international market conditions, it is also influenced by the local competition for high quality coffee.

Local price competition may help ensure that the farmers do get an organic premium as promised. Hence the prevalent buying price for conventional coffee in other parts of Mount Elgon during 2004/05 was UGX 1650. This means an organic premium of about UGX 300, or 15%. The same premium was observed in the 2006/07 season. Significantly, because local traders match the Kawacom price quite closely, local conventional farmers and organic farmers who sell off the project also get a premium. This is an important local spill-over effect of organic certification/quality improvement program.

One could argue that higher quality rather than organic certification accounts for most of the organic premium; on the other hand, the presence of the organic buyer is necessary to sustain a 'quality premium'. We have thus observed that the local price drops dramatically when Kawacom stops buying at the end of the season (e.g. from UGX 2450 to UGX 2000 in early 2006) and it increases again when Kawacom starts buying (e.g. from UGX 1900 to 2300 in September 2006).

5.4 Production

Outgrower capacity and income

The vast majority of the organic farmers were small scale farmers.^{xxxiv} The average farm size was 1.1 hectares, according to the household survey, and the average area under coffee 0.24 hectares. We found no statistically significant differences in farm

size (whole farm or coffee farm) between organic and conventional farmers, but other factors indicate that organic farmers had a higher production capacity than conventional farmers: organic farmers had 62% more coffee trees (indicating more intense land management); at 836 kg parchment equivalent per hectare, organic coffee yields were 32.7% higher than conventional yields; and organic farmers produced 40% more coffee in 2005/6 than conventional farmers (249 kg against 177 kg parchment equivalent). All these differences in productivity were significant.^{xxxv} Organic farmers also had a higher capacity (and incentive) for coffee processing; in 2005/06 they sold 89.3% of their coffee as dried parchment (and the rest as raw cherries or semi-processed), while the figure was only 58.1% for conventional farmers. The higher level of processing, together with the organic price premium, resulted in organic farmers getting a significantly higher average price for their coffee than conventional farmers (UGX 2108 per kg parchment equivalent, compared to UGX 1806, a difference of 21.2%). Higher volume and higher prices meant that the organic farmers' coffee revenue exceeded that of conventional farmers by 26% in 2005/06 (UGX 817,616 versus UGX 646,901), although the difference was not significant ($P = 0.08$). Cash expenditures on inputs, land, equipment and hired labour for coffee were low (19.7% of organic coffee revenues) and there were no significant differences between organic and conventional farmers on these indicators. Altogether this meant that organic farmers' coffee (net) income was 32.0% higher than conventional farmers' (UGX 656,177 versus UGX 497,159), although this difference was not significant ($P = 0.061$).

Focus group interviews indicated that there has been a general increase in the productive capacity of coffee farmers in the area since around 2000 when the organic project was established. Increased production has been the result of expanded acreage (although the general land scarcity limits this dynamic considerably), replanting of existing fields, and higher yields per tree due to improved management (fertilisation and weeding). Farmers cited the higher and more stable prices (a result not only of organic conversion but also of improved international prices since 2003) as the main factors underlying these investments. Another reason has been the low profitability of maize, related to low yields and low prices, which is the alternative cash crop to coffee in the area. Aside being less profitable to smallholders, maize farming was also much more demanding in cash and land resources than coffee. Hence it is no surprise that where coffee farms were expanded, this was often at the expense of maize.

Focus groups interviews likewise revealed that organic farmers had generally experienced a significant increase in coffee incomes since organic certification. The household survey confirmed that 84.2% of farmers had experienced an increase in coffee income, while only 2.6% had seen their income reduced. The survey also showed that 85.1% of farmers found that their income from coffee had become more stable since certification, and 73.7% said that they now get paid earlier in the season for their coffee. Improved income stability and timing are likely to have a positive influence on food security.

Adoption of organic methods and 'good farming practices'

Training and farm inspections (and women's participation)

EPOPA through AgroEco trained the Kawacom field officers in organic and improved coffee farming methods at the start of the project. Kawacom has thereafter received regular technical support from AgroEco (since 2004 at its own expense) and has recently hired its own agronomist. The Kawacom field officers in turn train the farmers. Demonstration sites were established from 2002 to test new technologies (e.g. cover crops) and enhance the impact of extension efforts. Tree planting has been promoted through the establishment of tree nurseries operated by field officers, from which farmers may obtain free seedlings. Technical training also occurs during the annual or semi-annual farm inspections, where the field officer checks if and how well the farmer applies the required farming practices. Although each visit is brief (15–20 minutes), it is an important occasion for receiving advice on and asking questions about specific management problems encountered by the individual farmer. This continuous interaction or 'hand holding' is probably more effective than class room-type training and is likely to significantly enhance the impact of the latter.

Low participation of women in both training and farm inspections is a major weakness, especially since women carry out most of the farm work. The interviewed women observed that married women rarely participate in training events (and only if conducted within the parish) and that they only accompany the field officer during farm inspections if the husband is not at home. Their access to new knowledge therefore depends in large part on the ability and willingness of their husbands to convey the extension messages.

The organic and good farming practices emphasised in training events and inspections were quite varied. The farming practices promoted were: improved spacing and intercropping, use of cover crops, mulching, application of compost and animal manure, soil and water conservation, biopesticides, coffee replanting and gap filling, coffee tree stumping and pruning, shade management (tree planting and trimming of intercropped banana plants), selective picking of cherries, and tree planting. Kawacom also promoted a higher level of precision in existing processing methods, including pulping, fermentation, washing, sieving, drying, sorting and storage. Because better processing is key for coffee bean quality, Kawacom has an interest in prioritising this aspect of coffee production in training and inspection, compared to improved farming practices, which mainly affect yields. This was largely confirmed by interviews with farmers and project staff and by household survey results.

Changes in farm management practices

All interviewed farmers had observed a general improvement in the level of management in coffee production since organic conversion, due in large part to intensified and more precise execution of already known practices, both in farming and processing. A focus group of male farmers listed and ranked the *tree and land*

management practices that had changed (improved) the most: 1. weeding, 2. applying animal manure, 3. mulching, 4. making channels for soil and water conservation, 5. coffee tree stumping, 6. coffee tree pruning. Two male focus groups ranked *harvesting and processing practices* in terms of the additional work load experienced after conversion. Drying was the activity associated with most extra work, followed by sorting, pulping, and selective picking of ripe berries.

A female focus group also noted a general improvement in coffee management. It ranked the farm management practices according to the absolute amount of time they spend executing them and observed that changes had occurred in all of them since organic conversion (Table 5.1). A male focus group noted that the main difference in labour use between organic and conventional farming was in processing as opposed to tree and land management; yet this observation may have been biased by the fact that men generally spend little time in the coffee field. The women's assessment (Table 5.1) seems to indicate the opposite, particularly when considering the change in the intensity of weeding, which was ranked as the most time consuming of all the activities.

Table 5.1. Changes in coffee management practices due to organic conversion

Task	Rank ¹	Change due to organic conversion
Weeding	1	More frequently. 4-5 times a year now (with a hoe), compared to 2 times earlier. Clean weeded fields were emphasised by field officers during the inspections.
Harvesting	2	Conscious picking of ripe berries. It takes longer time. More use of hired labour.
Drying	3	Longer period of drying – drying now takes 10 days during the rainy season, 4 days in dry weather. If sold to other buyers than Kawacom the coffee is only dried for 1 day, and it is not sorted or properly washed. This was how it was done before organic conversion.
Sorting	4	Better sorting. One bag takes one day to sort.
Mulching	5	They did not mulch the coffee when it had low value. They just left the banana leaves on the ground where they were cut, now they spread them out on the ground.
Apply animal manure	6	This is a new practice; more time is spent on it now.
Pulping	7	Kawacom introduced sieving at the time of pulping (all farmers have access to sieves).
Washing	8	Better washing.
Carrying coffee	9	Women must now carry the coffee to the buying point or to the Kawacom store if the buying truck does not come; middlemen pick the coffee directly from the farm.
Soil and water conservation	No rank	Increased frequency and better maintenance of water channels.
Stumping	No rank	More use of hired labour.
Pruning	No rank	More use of hired labour.

Notes: ¹ According to total amount of time spent by family labour in activity. **Source:** focus group interviews of female organic coffee farmers in Munaria Parish, October 2006.

In respect of the prohibition of chemical inputs, the focus groups observed that they had stopped using pesticides against coffee berry borer and coffee leaf rust, resulting in increasing problems controlling these pests, which however was compensated by the higher yields achieved through improved management.^{xxxvi} They did not use biopesticides (e.g. chilli solution) promoted by Kawacom against these pests due to lack of skills and materials. No change had occurred in the use of chemical fertilizers on coffee since these had never been used. But it was also observed that some conventional farmers in the region used fertilizers (and pesticides) and got higher yields as a result, although these farmers suffered a large yield loss in years when they could not afford fertilisers.

The focus groups thus indicated quite a broad change in coffee management since conversion, although few entirely new practices were introduced. An accurate assessment of the degree of change (i.e. in the intensity with which the practices were applied) was not possible through this method. As a proxy for this, the household survey compared levels of technology use between organic and conventional farmers. A higher level of use among organic farmers was observed only for some of the practices identified by the focus groups as having changed after conversion: planting of agroforestry trees, trimming of trees for shade reduction, lower shade cover from banana, use of improved stumping equipment, sorting of coffee, and lower use of chemical fertilisers and pesticides. In some cases this inconsistency is likely to be related to the difficulty of precise measurement of adoption levels (e.g. for weeding). In other cases it is likely that conventional farmers also have experienced improved price incentives (due to the presence of the project and to improved international prices) and responded by enhancing management.

In summary, the evidence suggests that while the changes in coffee farm management practices do not signify a 'deep conversion' to organic agriculture, they were large enough to have had significant productivity effects in terms of improved quality and higher yields, as described elsewhere. Hence most of the changes in farm management were not required for organic certification but were practices that enhance coffee yield and quality.

Cost implications of changes in management practices after conversion

Family labour. All the women interviewed agreed that organic conversion has increased their labour inputs in coffee production, concerning almost every aspect of production: weeding, animal manure application, harvesting, transportation to homestead, all processing tasks, and transportation to point of sale. This had increased the total amount of time they spend in farming. They also observed that the workload for men had not changed since organic conversion, although unsurprisingly this was denied by the interviewed men, who claimed that they also spend more time on the organic farms.

Hired labour. All interviewees noted an increase in the use of hired labour since conversion, mainly for weeding, but also in harvesting, pruning and stumping. The latter two tasks are almost always done by people with specialized skills and equipment. The wage rate has likewise increased since the start of the organic

project (labourers demand higher wages based on the higher prices). For weeding the increase has been around 40% and for harvesting around 75%. The cost of processing labour has likewise gone up: the cost of sorting has increased from UGX 500 to UGX 2000 per bag and the price of pulping has increased to UGX 1500 per bag. Because of the large proportion of farmers in the project area that had converted to organic farming, it is likely that this put pressure on the local wage rate. That said, we did not attempt to make quantitative estimates of what share of these increases could be attributed to the organic price premia, if any, and how much to the general increase in coffee prices or to other factors. The figures also need to be adjusted for inflation. Household survey data showed no significant difference between organic and conventional farmers in expenditures on hired labour.

Land. Investments in land for/with coffee have increased since organic conversion due to better prices and a more secure market.^{xxxvii} Farmers also observed that the cost of land have doubled over the last 5 – 6 years and that costs for land already with coffee had quadrupled (when the market was low, coffee trees gave no additional value to a piece of land).^{xxxviii} The household survey showed no difference between organic and conventional farmers in land purchases.

Inputs and equipment. The household survey showed that organic farmers spent significantly more cash on coffee processing (pulping fees) and equipment purchases (e.g. drying sheets) than did conventional farmers. Costs of inputs and equipment were not discussed by the focus groups.

6. Gender division of work in organic export production

A common criticism of the expansion of export crop production, not only for organic production but even more in organic because of the higher labour demand, is that it diverts scarce household resources away from food production, especially land and female labour, thereby reducing food self-sufficiency. Moreover, because women exert little or no control over the income from the export crop, and since they at the same time are mainly responsible for household food supply, it is argued that this will reduce household food availability. In this light, this chapter examines the sexual division of labour in coffee and pineapple, respectively, and how organic conversion has altered women's labour inputs in these crops. We also examine differences in men and women's perceptions of these issues. The analyses are mainly qualitative and based on focus group interviews. The next section examines how these labour dynamics, along with other factors, have affected household food production, which is the main responsibility of women in all study areas.

6.1 Pineapple

In Luwero and Kayunga pineapple growing was generally regarded as a man's activity, in both labour and income terms, while women were supposed to concentrate on food production. In line with this, the sexual division of labour work in pineapple production was skewed in favour of men who provided more labour than women for almost all activities and for all of the most time-consuming ones – planting, weeding and harvesting (Table 6.1). The activities for which women contributed most of the labour were the collection and carriage of the fruits at harvest time (if labour was not hired to do this) and sorting the fruit in the homestead (if the fruit was sold to Biofresh). Men and women had different perceptions of their respective labour inputs, however (Table 6.1, A and B). For the two most time consuming activities, planting and weeding, the female focus group assessed women's contribution to be lower than did the male focus group, while in the case of harvesting (collecting and carrying) the male group did not recognise the role of women. These differences may be due to differences between the two groups in the assessment of the role of hired labour in these activities. Women's relatively low efforts in pineapple production can partly be explained by the fact that the high pineapple revenues allowed most farmers to hire labour for the two most time consuming activities, weeding and planting, and sometimes for collection and carriage. In the few cases where a married woman had her own pineapple farm, she might assist her husband on 'his' ('the family') pineapple farm, but not vice versa.

The focus group interviews also revealed that women's work in pineapple is closely related to the intercropping of pineapple and food crops. Women thus mainly contribute to weeding pineapple during the first one or one and a half years when annual food crops (mainly maize and beans) are grown between the rows of the young pineapple plants (Intercrops in mature fields are banana, coffee, cassava, paw paw.) During this period women do about three-quarters of the weeding. Later, as the pineapple canopy develops and less space is left for food crops, weeding is mainly performed by men and hired labourers. It was also mentioned that weeding mature pineapple causes scratches and itching and that some men did not want to subject their wives to such painful work. Yet women had also been observed to weed mature pineapple fields, often in cases where there was no money for hired labour.

Table 6.1: Perceptions of the division of work in organic pineapple farming, Luwero

A. Men's perception (% of work done by labour category)

Activity	Men	Women	Hired labour
Planting	33	33	33
Weeding	50	25	25
Harvesting (cutting the fruit)	100	0 ¹	0
Collect and carry the fruits	0	0	100
Sorting fruit in homestead	30	70	0

Notes: ¹ Women carry out activity only if the husband is not present on the farm.

Source: focus group interviews in Luwero district, October 2006.

B. Women's perception (% of work done by labour category)

Activity	Men	Women	Hired labour	Rank (total use of time)
Clearing before planting	X		X	No rank
Planting ¹	75	25	0	1
Weeding	37	13	50	2
Harvesting (cutting the fruit)	100	0	0	3
Collect and carry the fruits ²	0	100	0	No rank
Sorting fruits in homestead	50	50	0	No rank
Selling the pineapple ³	100	0	0	No rank

Notes. ¹ The men make the lines and dig the planting holes, and the women plant the food crops between the pineapple rows and may help distribute the pineapple suckers to be planted.

² When the pineapple is sold to local traders, the trader collects the pineapple from the field. Hired workers are rarely used as farmers fear that they will not handle the fruit carefully enough. The women are assisted by their children.

³ The husband always sells the pineapple (except where a woman has her own field), although the wife may sell to Biofresh if the husband is not home.

Source: focus group interviews in Luwero district, October 2006.

6.2 Coffee

Focus group interviews with both men and women strongly suggest that women do most of the work in coffee production, although one male focus group stated the opposite. The male and female groups largely agreed on how much time (or effort) women spend in each activity as compared to men (Table 6.2).^{xxxix} The most notable exception was weeding where the men argued that due to their superior physical strength they contribute more to weeding than women, while the women contended that men only do 20% of the weeding work. Going by the women's perceptions, women carry out 50% – 90% of all work in the field, depending on activity, and 50% – 100% of processing and transportation. Aside from storage, the only activity on which men spend more time than women is selling the coffee and receiving the cash!

Men were often not much engaged in activities that required a constant presence on the farm, such as drying; these were left to women thereby tying women even closer to the homestead. Women were also highly engaged in those coffee activities that corresponded to their traditional roles in other parts of life, such as head load carrying (water and coffee beans), collection (manure), and washing (pulped coffee

beans). The focus group interviews also revealed that many of the coffee processing tasks require close cooperation between husband and wife (Table 6.2, last column) who take on complementary roles, often in line with established gender norms. In pulping, for example, the husband normally operates the hand pulper while the wife collects the water and sieves the pulped beans. Other examples of such complementarities in work are mulching, animal manure application, and soil and water conservation.

Because coffee and the land it is grown on is considered the exclusive property of men (also in legal terms since men inherit or buy the land), men have the overall responsibility for coffee production and make overall management decisions on issues such as planting, pruning, harvesting, hiring of labour, etc. Men also control the income from coffee (see Section 8). The role of women (except widows who may manage their own farms) in coffee production in Kapchorwa resembled that of an employee (with a discretionary salary).

The system of procurement of organic coffee has also affected women differently than men. The selling of organic coffee at the Kawacom central buying posts takes place in public (as opposed to selling coffee to middlemen at the farm gate) and this makes the exclusion of women from the actual selling, and thereby the receipt of income, more visible. Some women felt humiliated by this public display of exclusion. On the other hand, the issuing of sales receipts by Kawacom has improved transparency regarding coffee incomes (see below).

Table 6.2. Perceptions of the sexual division of work in organic coffee farming

Activity	Share of work done by women (%) ¹		Comments
	Women's perception	Men's perception	
Weeding	80	40	Men claim to turn the soil while weeding to facilitate planting of intercrops, and to 'dig deeper' than women.
Mulching	50	70	The husband harvests the banana leaves, while the wife collects and applies the leaves.
Animal manure application	50	70	The husband digs the hole for the manure around the coffee tree and the wife collects and applies the manure.
Soil and water conservation	50	0	The husband digs the new water trenches / channels, while the wife maintains them by emptying them for soil (de-silting)
Harvesting	50-70	50	The women observed that men want to monitor the quantity and quality of the harvested beans.
Carrying the raw coffee beans	90	70	The women carry the coffee to the homestead and to the place of pulping
Pulping	50	50	The wife collects the water and assists in machine operation, while the husband operates the machine most of the time.
Washing	100	100	The women observed that 'this is a woman's job'.
Drying	70-90	70	The women are at home monitoring the drying and bring the coffee beans into the house when it starts raining.
Sorting	50-80	50	The women observed that men assist them because they want to get the coffee ready for sale quickly. They also noted that men initiate the work but that the women and children carry it out.
Storing	N/a	30	Men claim to have the main responsibility for storing.
Carrying coffee to place of sale	90-100	70	The women observed that it was their duty to carry the coffee to the point of sale and then return home with the empty bags.
Selling the coffee	100	100	The women observed that their husbands did not allow them to take part in the selling of the coffee. This could be a humiliating experience since they had to carry the coffee to the place of sale.

Notes. ¹ The percentage of the work done by is not shown – it is complementary so the total amount done by women and men adds up to 100% (the contribution of hired labour was not considered in the ranking).

Source: focus group interviews in Kapchorwa district, October 2006.

Because women carry out the majority of the work in coffee, one can expect that the additional work load associated with organic certification (including higher quality standards) is mainly borne by women. In the previous section we saw that the standards imposed or encouraged by Kawacom induced an increased household effort on a wide range of farm management practices, and in this section we have observed that women provide most of the labour in most of these practices. It is therefore plausible that organic conversion has significantly increased women's labour effort in coffee production, while the effect on male labour has been weaker. This analysis was largely confirmed by both the male and female focus groups, who observed that women's work load had increased considerably after organic conversion. One of the female groups moreover found that the work of men in contrast had not changed markedly. It was also observed that the additional labour requirements were to some extent met by hired labour, especially in weeding.

7. Effect of organic conversion on food production

Food crops and coffee compete for scarce household resources – labour, land and cash. Improved coffee production incentives brought about by organic conversion may therefore impact negatively on food production through the reallocation of these resources in favour of coffee. But organic conversion may also benefit food production through technology and cash investment ‘spill overs’: 1) skills and inputs acquired in the organic project may be applied to food crops and changes in coffee management may affect intercropping options; 2) additional cash income earned through organic coffee production may be reinvested in food farming. The net effect of these dynamics on food production cannot be assumed but must be examined empirically; we did this in qualitative terms through focus group interviews.

7.1 Coffee

The general conclusion for the organic coffee case is that *food production* has decreased, in part due to the expansion of coffee on land previously cultivated with food, and in part because of increased population pressure (less farmland per person) in relation to already high levels. Other causes were declining soil fertility, affecting mainly maize, and increased disease infestation, affecting mainly banana. Yet the focus groups also observed that in spite of reduced local food output, *food security* had not deteriorated; instead they found that higher coffee incomes had led to improved access to food through the market. The most important food crops grown in the study area were, listed according to the rank given by a female focus group: cooking banana, maize, coco yam (in the lower lying areas), Irish potatoes, vegetables, beans, sweet potatoes and climbing yams.

Labour and land effects

Increased labour inputs by women in coffee production in relation to already high levels involves the risk of reduced food production, for which women in Kapchorwa are the main responsible. According to their own assessment, women spend about two-thirds of their farm labour time on coffee and one third on food production. The two labour peak periods for women correspond to the long and short rainy season, respectively. The first peak occurs from March to May, when coffee is weeded and food crops planted (and weeded). The second is from September to November, when coffee is weeded and harvested and food crops harvested, planted, weeded, and harvested. Interestingly, none of the focus groups found that they spend less time in food production as a result of the increased labour effort in organic coffee farming. Instead, organic conversion seems to have induced farmers to increase the total amount of labour they invest in farming at the expense of time spent in off-farm activities (especially for women), household work, or leisure (the men had also observed an improvement in time management). Where the focus groups did observe reduced labour inputs in food crops, this was the result of reduced food crop acreage due to the expansion of coffee (see below) or to disease of food crops (banana wilt).

An average farm size of only 1.1 ha (of which 0.24 ha is coffee), high land value, and visual evidence of high land use intensity support the common observation that land is very scarce in the organic project area. In accordance with this, focus group interviews suggest that organic conversion, together with a general increase in coffee prices, has affected food crop farming mainly through a reallocation of land resources in favour of coffee. The crops affected in this way were maize, sweet potatoes, banana, and beans. When coffee was planted on new land, this was mainly at the expense of one of the main staples, **maize**, and its intercrop, **sweet potatoes**, leading to a general reduction in the acreage and output of these crops. Three comments are warranted here. Because **maize** is both a cash crop and a food crop, the effect on household food self-sufficiency of the reduced acreage has only been partial. Second, some farmers have compensated by planting maize on rented land outside the project area (on the plains below Mt Elgon). Third, farmers observed that because of declining soil fertility and lack of organic material, maize yields rely increasingly on expensive chemical fertiliser inputs, which reduces the viability of growing maize for subsistence purposes.

Farmers also noted reduced production and consumption of **cooking banana**. Banana is a key staple in the area and an important income source for women. Banana is most often intercropped with coffee; less space therefore became available for banana as coffee plantations were replanted and the shade from banana leaves reduced (a recommended practice). Since 2004 banana wilt has also started to spread in the area, wiping out most plants as it advances. The effect of organic conversion on **bean** production is ambiguous. On the one hand, monocropping of beans has been abandoned due to reduced land availability (in part a result of coffee expansion) and beans are now only grown as an intercrop. On the other hand, organic conversion has contributed to reduced weed infestation, higher soil fertility, and fewer banana plants on coffee land. This has in turn improved the conditions for using beans as intercrop in coffee plantations and more beans are now harvested from coffee plots. (Beans do not reduce coffee yields.)^{x1}

Technology and investment effects

Focus group interviews suggest that there were positive technology and investment spill-overs from organic coffee to food crop farming. The organic farmers applied several of the organic and good farming practices promoted by Kawacom to their food crops. The women emphasised animal manure application (on vegetables, maize and banana) and water trenches on steep land, while the men also mentioned better weed control. Both men and women observed that a (small) part of the income from organic coffee is invested in food crop farming: chemical fertilisers for maize production, seeds for maize and cabbage, rented land for maize (by men) and vegetables (by women) growing, and hired labour for maize farming.

7.2 Pineapple

The general conclusion for the pineapple case is that while both men and women have increased their efforts in pineapple farming since organic conversion, this has not resulted in reduced food production. In both districts farmers noted a big decline in cooking banana production, which is the traditional staple, but this was the result of disease (banana wilt) and not the expansion of pineapple farming (banana has been replaced by maize, sweet potatoes and cassava.) Household self-sufficiency of food staples was a dominant strategy in both districts as well as a strong norm. A high average level of food self-sufficiency among the organic farmers was indicated by the fact that food purchases ranked only five in the use of pineapple incomes (see later). The interviewees moreover said that the majority of food purchases were higher value food items like meat, fish, sugar, tea, cooking oil, etc.

Labour and land effects

At first sight it would seem that the expansion of pineapple farming has reduced food production among the organic farmers. Women have the main responsibility for food production and their labour inputs in pineapple farming have clearly increased. Secondly, farmers has increased the acreage under pineapple and reduced the spacing of pineapples, both of which reduce the available space for other crops. Yet all focus groups maintained that food production has not declined. The interviews revealed the existence of several mechanisms related to land and labour utilisation that help explain how organic farmers have maintained food production while increasing pineapple production. First, demands from pineapple farming on women's labour have been limited for two major reasons: a relatively strict sexual division of labour appears to have limited the ability of men to draw on women's labour for this purpose (another reason may be that pineapple was a new cash crop introduced at a time when women had more influence over their own labour, in contrast to coffee that has been grown in the study area for more than fifty years). At the same time, high pineapple incomes have allowed farmers to hire-in ample labour.

Secondly, competition for land between pineapple and food crops has been mitigated by three factors: farmers have reinvested pineapple incomes in buying or renting land for pineapple but to a lesser extent also for food crops (land ranked 2 in use of pineapple income) – partly as result of this, the organic farmers had relatively large average land holdings (3.5 hectares); pineapple yields per area unit were very high thereby reducing land occupation, and; food crops were intercropped with pineapple. It is important to note that most of these mechanisms only work effectively on a relatively small scale: if all farmers in the study areas were to expand pineapple production to the same extent as organic farmers have done, local food production would likely suffer. That said, given the high incomes earned in pineapple, this would not necessarily translate into reduced food security, as discussed in the next section.

Technology and investment effects

Focus group interviews suggest that organic pineapple farming has positive technology and investment spill-over to food crop farming. We have already mentioned that farmers invested part of the pineapple income in buying or renting land and hiring labour and that some of these investments were directed at food crops, although possibly a minor part. We do not know the magnitude of these investments, yet a female focus group gave investment in food production a fifth rank out of five, while a male focus group in Luwero said that they invested more cash in food crop farming than in coffee, the other major cash crop in the area. In terms of technology, the focus groups observed that they apply some of the organic methods acquired through Biofresh in food crop farming, such as soil and water conservation and intercropping (food crops with pineapple) in maize, and the use of animal manure and mulch. These benefits notwithstanding, none of the focus groups had observed an improvement in food crop yields. This can be due to the relatively recent introduction of these practices, which obscures their effects relative to yield factors with high temporal variability, particularly rainfall. Also, for practices such as physical soil conservation the yield effects can be delayed by several years.

8. Effect of organic conversion on household food security and expenditures

We have earlier described how revenue from the crops that are subject to certification (pineapple and coffee) has increased markedly since organic certification and that these revenues were higher for organic than for conventional farmers of the same crop, especially in the case of pineapple. This section concerns how the income from organic farming was spent, who controlled it (men or women), and how it contributed to household food security in terms of amounts and quality of food purchased. In this regard we examine differences in men and women's priorities and perceptions. We also examine changes in women's personal cash income since organic conversion because such changes affect food consumption in proportion to how much of these incomes women spend on food. Reliable household survey data on expenditures and consumption related to food were not available; this chapter is therefore based entirely on focus groups interviews, in particular ranking exercises.

8.1 Pineapple

Income earned by women

Few married women operated their own pineapple plot (in addition to the 'family' plot controlled by the husband) that allowed them to earn personal income from pineapple sales. Apart from households headed by widows or divorcees, in only six (all in Luwero) out of the 34 households in the Biofresh pineapple scheme did a married woman earn such an income. In all cases this was from a plot much smaller than that operated by the husband. Moreover, according to the interviewed women, the wife was often allocated a relatively small share of the organic order allocated to the household. It was observed that other demands on women's time,

particularly food production and presumably domestic work, were a reason why few women planted their own pineapple. While a wife occasionally was allowed to sell pineapple from the family field, the bigger part of women's personal farm income came from the sale of food crops, other cash crop such as coffee or vanilla, livestock or livestock products.^{xli} In Kayunga, women's most important income sources were maize, beans, and vanilla/coffee, in that order. Some of these women were members of a Rotating Savings and Credit Association (ROSCA) which provides revolving funds for buying livestock and other investments. It is noteworthy that the women had not experienced a reduction in their personal income as a result of the increased emphasis on pineapple growing (by their husbands) since organic certification, although this issue was not investigated in depth.^{xlii}

The women who earned personal pineapple incomes typically spent them on the following items, according to one such interviewed woman: contributions to general household needs (school fees, school uniforms, clothes), labour for food production, and own personal needs. (No rank is implied in this listing.)

Use of income from pineapple

In Luwero and Kayunga men exercised a high degree of control over the income earned from the family pineapple plot. Divorced and widowed women enjoyed the same control as the male heads of households. The income is recognised by both genders as belonging to the husband, who at the same time is expected to take care of all household expenditure. There were differences between households as to how much the wife in practice influenced the way the income was spent, but the focus group interviews did not allow us to identify any pattern in this variation.^{xliii} Both men and women observed that as a rule the husband gives a small part of the pineapple income to his wife for her personal needs ('cash in hand') such as clothes, hairdresser, make up, medicine, visiting relatives, etc.

Each focus group was asked to list and rank household expenditure financed by pineapple revenues. The ranks given by each group were then converted into scores and aggregated for all four groups. Based on these scores an overall ranking was made (Table 8.1). Children's education (school fees, books, uniforms) was consistently given the highest rank and achieved maximum score. As with everyone else in Uganda, the organic farmers regarded children's education as the most powerful means for accessing wealth by increasing chances for salaried employment or more remunerative off-farm activities (as well as power and influence). The second most important expenditure was investment in pineapple farming, particularly in land but also hired labour and fertilisation (coffee husks), suggesting that the organic farmers are still in a phase of expansion and are optimistic about the market prospects for pineapple. House construction and livestock purchases rank three and four, while food purchases only rank five.

It is interesting to observe the dominance of longer term investments in the expenditure pattern of organic farmers and that two of the top four expenditure categories represent farm investments. While this possibly reflects the fact that these farmers belonged to the middle and top rural income brackets (average farm

income was around US\$ 2000 per year), it also clearly contradicts the common perception that smallholders in Uganda are not investing in farming. The rankings of each group (Table 8.2) moreover reveal other types of farm investment, i.e. hired labour, farming tools, and food production in general. In contrast, they consistently assigned food purchases a low rank, confirming our earlier observation that many organic farmers enjoyed a high level of food self-sufficiency.

In order to examine expenditures on the margin, i.e. those related to income increases induced by organic conversion, men in Kayunga and Luwero were further asked how they have spent the *additional* income earned from pineapple since joining Biofresh (for men in Luwero this is the ranking shown in Table 8.2). High priorities were again given to education (private schools in Kayunga), house construction, and farm investment. But interestingly, farmers in Kayunga also mentioned increased expenditures on personal transportation (in turn inducing some farmers to engage in *boda boda* driving as an off-farm activity) and mobile phone communication (also a business opportunity).

Table 8.1: Ranking of how the revenue from pineapple is spent by the household (overall ranking from four focus groups)

Item	Average score ¹	Overall rank ²
Education (school fees)	1.00	1
Buy land / expand pineapple fields	1.25	2
House construction	2.50	3
Buy livestock	2.75	4
Buy food	3.50	5

Notes. ¹ The ranks given by each of the four focus groups were converted into scores using these rules: rank 1–2 = 1, rank 3–4 = 2, rank 5–7 = 3, rank 8–9 = 4, rank 10 and above = 5. The average score was then computed for each item.

² Overall rank assigned based on average score (lowest average score=rank 1 etc).

Source: focus group interviews, October 2006.

Men and women had quite similar perceptions of how the revenues from the family pineapple plot were used (Table 8.2). Both genders consistently gave education the top rank, and they assigned similar ranks to house construction, land and other investment in pineapple farming, as well as livestock. This shows that women were generally well aware of how pineapple revenues were spent, even if they had little formal control over household expenditures and did not always agree with the prioritisation made by their husband.

Table 8.2: Ranking by men and women of how the revenue from pineapple is spent by the household

District	Men's ranking		Women's ranking	
	Item	Rank	Item	Rank
Luwero ¹	Education	1	Education	1
	House construction	2	Buy land	2
	Buy land / expand pineapple field	3	Buy livestock	3
	Buy livestock	4	House construction	4
	Savings to go to Mecca	None	Invest in food production	5
	Mistresses	None		
Kayunga	Education	1	Buy land / expand pineapple field	1
	Buy land / expand pineapple field	2	Education	2
	Medical care	3	Buy clothes	3
	Social responsibility	4	Buy livestock	4
	Hire labour in pineapple production	5	Buy household commodities	5
	Buy clothes	6	Buy food	6
	Buy farming tools	7		
	Buy food	8		
	Money for wife's upkeep	None		

Notes: ¹ Men in Luwero ranked the additional income earned from pineapple since conversion.

Source: focus group interviews, October 2006.

8.2 Coffee

Income earned by women

Women in Kapchorwa earned individual incomes from a variety of petty activities: brewing local beer (*komek*), sale of pancakes and doughnuts (*mandazi*), sale of charcoal and fuel wood, hiring out labour, petty trade in maize, and sale of small surpluses of food (mainly the vegetable *sukumawiki*). Women no longer sold cooking banana because disease (wilt) had diminished production, and they had also stopped selling sweet potatoes, also because of reduced output (related to a reduction in maize acreage with which sweet potatoes are intercropped). No women sold maize or beans. The latter income sources were entirely controlled by men (who had experienced reduced incomes from these crops). Women's sale of food crops was generally minor compared to other income sources, and the money earned from this activity had generally diminished.

No married women operated individual coffee farms. While men formally controlled all revenues from coffee, the interviewees revealed that women sold small amounts of coffee as raw cherry or wet coffee 'to buy salt' and food. The women sometimes informed their husband about these sales and sometimes not. The quantities sold this way are believed to be minor. Widows with children and some divorcees operated their own coffee farms and controlled the income.

As is clear from the above, women's individual incomes were generally much smaller than those controlled by men. The female focus groups asserted that coffee farming had priority over their 'own business' and that coffee farming together with their other responsibilities in the household left them with little time to earn

individual incomes. They also observed that no coffee income was invested in their personal businesses. It is therefore very likely that women's increased effort in coffee farming in recent years has occurred at the expense of their own income generating activities. Hence, while men over the last five years have enjoyed an increase in the income they control (from coffee), women appear to have experienced the opposite.

Use of income from coffee

The focus group interviews revealed that men in Kapchorwa decided unilaterally how income from coffee and other cash crops was spent (except in the case of women's 'personal' incomes discussed above). In short, it was observed that the husband buys what he thinks is needed in the household and spends the rest as he wants. Sometimes he gives his wife money for specific purposes, but women were not supposed to question their husband on the use of income. The latter in turn was not always inclined to share information about cash earnings and expenditures with his wife. For example, some of the interviewed women observed that their husband 'made them work hard on the farm' by pretending that there was not money to hire labour. In rare cases the husband regularly consulted his wife on household expenditures; this apparently occurred mainly among older couples where a higher level of trust and cooperation had had time to develop. Another factor was that older men earned less cash because they had bequeathed some of their coffee to their sons. Hence transparency with respect to the use of income from coffee and other farm income was generally low among the organic farming families (as it was among other families in the area). In this regard, some of the interviewed women observed that their husband showed them the sales receipts issued by Kawacom and found that this had improved transparency in the household economy.

Each focus group was asked to list household expenditures and then to rank them according to the amount of coffee revenue spent on each type of expenditure (Table 8.3). The results from these rankings were then aggregated into one overall rank (Table 8.3, last column). As in the case of pineapple, most money was spent on children's education (school fees). This category was followed by food purchases.

When looking at the ranking of the kinds of food purchased (Table 8.4), it is interesting to note that while most money is spent on 'non essential' foods, foods that are grown by farmers themselves (maize flour, vegetables, beans) also feature among the top ranked items. (Cooking banana and maize were the main staple crops grown in the area.) This indicates that while the organic farmers were not self-sufficient in food staples, they did not appear to depend heavily on the purchases of these foods either. This conclusion is supported by the estimate of one of the female focus groups that 20% of household income was spent on food.

Some women felt that men did not give sufficient priority to food purchases, and that they often had to quarrel and put pressure on their husband to get money for food. One female focus group was asked how they would prioritise household expenditures if they were given the power to do so. These women gave food purchases a (hypothetical) second rank (not shown), while the male groups ranked

(actual) food purchases 3 and 4 respectively, suggesting that women value or prioritise household food supply slightly higher than men.

Table 8.3 suggests that part of the household budget was invested in coffee farming in the form of hired labour, which was placed third place in the overall ranking. The household survey showed that organic farmers on average spent UGX 32,583 on hired labour in 2005/06. While this was only 5% of the average coffee revenue that year, it was the single largest farm expenditure. Livestock investments were given low priority, which corresponds to the unfavourable local conditions for livestock rearing (low fodder availability). One group of men ranked investments in off-farm enterprises ('business') very high, possibly due to the fact that this group consisted of relatively large farmers who probably earned relatively high incomes. Lastly, one of the women's focus groups claimed that many men in their community squandered much of the income from coffee on women and alcohol, but in the ranking exercise these items were given a low or no rank. They also observed that the sanctions against economically or other irresponsible individuals had become tougher and that a woman's lineage could protect her from 'economic' or other forms of abuse from her husband, sometimes through physical punishment.

Table 8.3. Ranking by men and women of how the income from coffee is spent by the household

Item	Ranking by group ³				Average score ¹	Overall rank ²
	Men 1	Women 2	Men 2	Women 1		
School fees	1	1	1	1	1.00	1
Buy food	4	3	3	2	3.00	2
Hire labour on coffee	2	4	4	7	4.25	3
House construction/maintenance	7	2	8	3	5.00	4
Buy clothes & shoes	5	5	10	6	6.50	5
Medical expenses	3	- ⁴	5	4	-	-
Buy livestock	6	-	9	8	-	-
Drinking alcohol	-	-	7	5	-	-
Invest in business	-	-	2	-	-	-
Household utensils and furniture	-	6	-	-	-	-
Mistresses	-	-	-	-	-	-

Notes. ¹ The ranks given by each of the four focus groups were converted into scores using these rules: rank 1–2 = 1, rank 3–4 = 2, rank 5–7 = 3, rank 8–9 = 4, rank 10 and above = 5. The average score was then computed for each item.

² Overall rank assigned based on average score (lowest average score=rank 1 etc).

³ Group codes: Men 1 = Kapkwirok men's focus group ('small farmers'); Men 2 = Munaria men's focus group ('large farmers'); Women 1 = Munaria women's focus group. Women 2 = Kapkwirok women's focus group.

⁴ "-" indicates that no rank was assigned.

Source: focus group interviews in Kapchorwa district, October 2006.

Table 8.4. Ranking of how the income from coffee is spent by the household on different food items (ranking by male and female organic farmers)

Food item	Rank (by focus group) ²			Average score ²	Overall rank ³
	Men 1	Men 2	Women 1		
Sugar/tea	5	1	1	2.3	1
Maize flour	1	5	- ⁵	3.0	2
Cooking oil	4	3	2	3.0	2
Vegetables ¹	2	4	5	3.7	3
Meat	- ⁵	7	3	5.0	4
Rice	-	6	4	5.0	4
Salt	3	-	-	-	-
Beans	-	2	-	-	-
Fish	-	9	-	-	-
Irish potatoes	-	-	-	-	-
Yams	-	-	-	-	-
Cassava	-	-	-	-	-
Bread	-	10	-	-	-
Sweet potatoes	-	11	-	-	-
Groundnuts	-	-	-	-	-
Wheat flour	-	8	-	-	-

Notes: ¹ Cabbage and *sukumawiki* (greens)

² Group codes: Men 1 = Kapkwirok men's focus group; Men 2 = Munaria men's focus group; Women 1 = Munaria women's focus group. Kapkwirok women's focus group did not rank income use.

³ Ranks were converted to scores using these rules: rank 1–2 = 1, rank 3–4 = 2, rank 5–7 = 3, rank 8–9 = 4, rank 10 and above = 5.

⁴ Overall rank based on average score.

⁵ "-" indicates that no rank was assigned.

Source: focus group interviews in Kapchorwa district, October 2006.

Changes in household expenditures since organic conversion

The focus groups were also asked to assess changes in household expenditures since organic conversion. Significantly, both male and female focus groups observed that food security had improved due to the increase in coffee incomes which had improved their ability to cover the household food deficit through the market. One indication of this was a reduction in (or elimination of) the length of the 'hunger period' period (June – July) when households experience food scarcity, i.e. when there is no or little food in the house and no cash with which to buy it. With respect to food quality, it was less clear if the amount of money spent on higher value foods had increased, except in the case of small dried fish (*mukene*) which were now bought regularly in addition to vegetables.

The interviewees had observed several changes in local consumption patterns that indicated that farmers were earning higher incomes from coffee now. Many had invested in iron-sheet roofing and many were sending their children to private schools and boarding schools, while the enrolment of children in secondary school had increased markedly according to a secondary school teacher. The interviewees also observed that farmers were investing in small shops (which were now also found in small villages) and other petty businesses; some bought livestock, and

some were now sleeping on real mattresses (a common wealth indicator in the area). There was also a noticeable increase in the consumption of alcohol in the form of local brew, and, especially, bottled beer.

9. Conclusion

The central conclusion from the study is that organic farming has not reduced household food security but rather improved it through higher incomes that have enhanced the capacity for accessing food through the market.

The pineapple case was characterised by high levels of food self-sufficiency and organic conversion had not led to reduced food production. This was mainly due to the fact that the expansion of pineapple farms and their improved management have occurred through additional investments in land and hired labour rather than through the diversion of these resources away from food crops. These dynamics were related to the high incomes earned from pineapple as well as large average farm size. Increased pineapple income that reached an average of around USD 2000 per year in 2005 was the result of expanded production and improved prices, in turn related to both organic certification and a favourable conventional local/regional market. At this level of cash income, most organic farmers were well capable of covering their calorie needs as well as purchasing higher value foods such as meat, sugar, tea, rice and so on. Food purchases thus ranked only five in household expenditures.

The general conclusion for the organic coffee case is that food production has decreased after organic conversion, mainly due to the expansion of coffee on land previously cultivated with food crops. Other causes (and these had no relationship to organic farming) were increased population pressure (less farmland per person) in relation to already high levels, declining soil fertility affecting mainly maize, and increased plant health problems affecting mainly banana. Very small average farm size together with lower capacity for land investments (land was expensive relative to coffee revenues) meant that the expansion of coffee farming had occurred at the expense of land planted with food crops, especially maize and its intercrop, sweet potatoes. At the same time, however, improved weed management in coffee had created new opportunities for intercropping beans with coffee. Organic farmers had clearly increased labour efforts (and cash investments) in coffee management due to higher and more stable coffee prices (to which the organic project had contributed substantially) and to the stricter quality requirements of the organic exporter. This had occurred in a context where women supplied the major part of labour inputs in both coffee and food crop farming, and where the use of hired labour was limited due to low coffee revenues relative to wage costs (and due to competing demands on cash from school fees and food purchases). As a result, women had experienced an increased work load in farming since organic conversion, which increased their total work burden and reduced the time available for earning individual incomes. Even if they had little control of the additional income earned from coffee, the women found that this benefit was well worth the extra work effort.

Due mainly to land shortage most farmers were not self-sufficient in calories or proteins and food purchases thus ranked high in the household budget. It is likely that this was also the situation before organic conversion. In this context, it is interesting that in spite of reduced food self-sufficiency after conversion, the focus groups observed that *food security* had not deteriorated; instead the higher coffee incomes had improved their overall access to food through the market.

The study also showed that both pineapple and coffee farmers had applied some of the improved farming practices acquired through the organic project on their food crops. There was also limited reinvestment of organic revenues into food crop farming. In both cases a major limiting factor was the decline in a key staple crop, cooking banana, due to disease ('banana wilt', its incidence is completely unrelated to organic farming).^{xliv}

Another key finding is that organic certification was associated with a significant increase in the costs of production (per unit of output), especially in respect of inputs of family and hired labour; yet the benefits in terms of higher organic crop revenue still outweighed the costs. This meant an increased income from the organic crop since conversion, especially for pineapple. However, while the men enjoyed almost exclusive control of the income from organic farming, it was the women who did most of the additional farming and processing work needed to meet the organic certification and stricter quality and farm management requirements of the organic exporter. The skewed gender distribution of the costs and benefits associated with certification was much more pronounced among the coffee farmers, however. This seemed to be the result of differences in gender relations, in land availability and farm size, and in market conditions: 1) gender relations seemed generally more equal among pineapple farmers thus giving women better access to pineapple incomes and the men less command over their labour for the purpose of pineapple growing; 2) pineapple farmers earned very high incomes, due to larger farm size, high yields, and favourable market conditions, and this allowed them to hire more labour thereby relaxing the demand on women's labour.

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Endnotes

ⁱ Sales were expected to reach US\$ 40 billion in 2006 (Willer & Yussefi, 2007). This would mean an increase of 21% since 2005, signifying a significant increase in the annual growth rate compared to the previous period.

ⁱⁱ Estimates of annual certified organic imports into the EU in 2001 (Hamm et al 2002) and 2002 (CBI 2005) are for 200,000-550,000 tons of cereals, 50,000-208,000 tons of vegetables, 30,000-50,000 tons oilseeds, 80,000 tons bananas, 14,000 tons cocoa, 13,000 tons coffee and 1,000 tons meat.

ⁱⁱⁱ This performance is especially striking if compared to the slow progress of conventional agricultural exports on the continent.

^{iv} In terms of health effects, research in organic cotton shows that the families of organic farmers are less sick and that this is attributed mainly to the absence of agrochemicals (Ton, 2002; Ferrigno et al. 2005).

^v Data collection included household surveys of smallholder farmers of organic coffee, cocoa, vanilla and pineapple in Uganda and of cashew and pineapple farmers in Tanzania. In each case, matching control groups of conventional farmers were also surveyed. Focus group interviews and other qualitative methods were also applied.

^{vi} The research is part of 'Standards and Agro-Food Exports: Identifying Challenges and Outcomes for Developing Countries' (SAFE) programme. The project is running from 2005 to 2010 and is carried out jointly by the Danish Institute for International Studies and the Department of Agricultural Economics and Agri-business at Sokoine University, Tanzania.

^{vii} Further work will examine: the distribution of benefits among the organic farmers (inter-household equity); the issue of off-scheme side selling, and the local spill-over effects of organic certification on the price of products sold by conventional farmers.

^{viii} Most of these standards are quite loosely formulated. A set of more detailed standards on biodiversity and landscape conservation/management are under development and are described in the document "D2 Draft Biodiversity and Landscape Standards" (downloaded 03 April 2007 from www.ifoam.org).

^{ix} This number refers to the schemes supported by the Export Promotion of Organic Products from Africa (EPOPA) in these two countries (www.epopa.info) as well as information collected by the authors in Uganda. The products are coffee (Arabica, robusta, instant), cotton, cocoa, vanilla, ginger, other spices, pineapple and other fresh fruit (apple banana, passion fruit), sesame, peanuts, cashew nuts, shea butter, honey, hibiscus, and essential oils.

^x In comparison, the share for South Africa was 0.1% and for Egypt 0.7%. The share of agricultural land under organic management for the 10 countries in Europe with the highest shares ranged from 27.9% in Liechtenstein to 5.6% in Denmark, although 7 out of the 10 were below 10%.

^{xi} EPOPA is funded by the Swedish International Development Corporation Agency (Sida) and managed by two consultancy companies (Agro Eco and Grolink).

^{xii} Of the 16 export operations in Uganda with certification at some point during 2005, 12 had received support from EPOPA (Gibbon, 2006).

^{xiii} EPOPA project support has included the following: management assistance, staff training, field officer training in organic agriculture and extension, farmer mobilisation, techniques and inputs, providing seeds to farmers, technical consultancy, product quality management, market surveys and buyer contacts, participation in organic trade shows, project presentations and brochures, development and revision of Internal Control System. (Source: www.epopa.info.)

^{xiv} The energy efficiency of organic farming was 19% higher than for conventional farming. While the study concluded that the organic system on balance was 'a realistic alternative to conventional farming systems', the lower yield finding led critics of organic farming to announce that a global conversion to organic farming would seriously worsen global food insecurity and that '2 billion people would perish' as a consequence (Reason Magazine, June 2002). The general argument behind the latter view would be of the kind: other things being equal (and this is a big 'if'), a general reduction in food crop yields will tend to reduce global food supply and hence increase food prices in developing countries, which in turn will reduce food access for the urban poor and for poor farmers who are net buyers of food (e.g. farmers with small land holdings or producing under unfavourable agro-climatic conditions). In contrast, researchers at Cornell University are finding that organic conversion at a global scale can still satisfy future food requirements (the results of this research is not yet published). The present study does not concern food security on a global scale and therefore will not further discuss these issues.

^{xv} The studies were done as part of the research programme Standards and Agro-Food Exports (SAFE) that also included a case study of the Bundibugyo cocoa-vanilla scheme operated by Esco (U) Ltd, with 1,700 members, and parallel studies of organic pineapple and cashew nut schemes in Tanzania.

^{xvi} EPOPA's financial records refer to allocations rather than actual expenditures. In addition, many payments were channelled through agencies providing services to exporters rather than directly to exporters, and payments of this kind were not generally broken down by purpose of expenditure.

^{xvii} See Gibbon and Bolwig (2007) for a description of the sampling frame of the household surveys.

^{xviii} To our knowledge no such export occurs in Uganda. Sea freight to the EU is both cheaper and faster from West Africa (10 days, about \$0.5 per kg) than from East Africa (16 days, \$3500 per container or about \$0.75 per kg). Truck transport from Uganda to the port of Mombasa is moreover expensive (\$3000 for a 10 ton refrigerated container) and slow (5-6 days) due mainly to slow customs clearance. Hence, since the shelf life of pineapple is 21 days, these freight times at the moment hinder Ugandan pineapple exports by sea. In an attempt to see how the cost and duration of overland and sea freight may be reduced, Biofresh is planning trial sea freight of pineapple to Europe in 2007.

^{xix} When picked at right time, the Smooth Cayenne is half green, half yellow. When picked unripe in the case of sea freighted, the Smooth Cayenne is green.

^{xx} For banana, a certificate of origin (Form A), related to the General System of Preferences, must also be completed. The forms are acquired from the Uganda Export Promotion Board.

^{xxi} See Gibbon and Bolwig (2007) for more information on income and factor endowments.

^{xxii} Yet we found no significant differences in non-capital factor endowment (whole farm area, number of plants, household labour) between organic and conventional farmers. Several reasons may account for this inconsistency between factor endowment variables and volume produced. 1) The statistical significance of differences cannot be shown due to relatively few

observations (30 in each group). 2) Organic farmers had more mature pineapple plantations, indicated by a significantly higher average age of plants, which can be expected to be higher yielding. 3) While no significant difference was found in the amount of labour hired, because they were operating more mature fields the organic farmers could use relatively more of this labour on operations that had a bigger yield effects (in particular weeding of bearing plants). 4) The organic price premium is an incentive for organic farmers to allocate a more of their family labour to the pineapple farm. 5) Organic farmers may have been more efficient managers due to the training received.

^{xxiii} The Biofresh Production Manager holds a Diploma in general agriculture and is studying for a BSc in agriculture. He worked for another organic exporter from 2001 – 2003 before joining Biofresh, and before that for a local farmers association.

^{xxiv} The perceptions of the focus groups that organic farmers face higher costs than conventional farmers seemed to contradict the results of the household survey, which compared the Biofresh organic farmers with a control group of conventional farmers. The survey showed that conventional farmers on average incurred much higher expenses on planting materials, coffee husks, land acquisition, and hired labour, with the result that their total average costs were almost five times higher than those of the organic farmers (UGX 2,072,046). Yet the high level of investment represented by these costs to a large extent reflected the fact that the conventional farmers were in an earlier phase of establishment than the organic farmers and were spectacularly expanding production. Once pineapple farmers have reached a certain scale of operation, they are generally able to generate new planting material requirements from existing production, for example (Gibbon and Bolwig 2007).

^{xxv} Farm income is net of costs and includes revenues from all crop land sales.

^{xxvi} Unfortunately we did not obtain reliable data on the change in the wage rate, but some farmers said that the cost of weeding one acre of pineapple had doubled in recent years.

^{xxvii} This can be illustrated by the price demanded by hired labourers for weeding (or spraying) one acre. The organic farmers observed that while they had to pay about UGX 120,000 per acre, conventional farmers paid only UGX 80,000. Conventional farmers paid less because the labourer took less time to weed the field due to the wider spacing of the pineapple or because he could choose to use herbicides. Hiring labour to assist in harvesting costs about UGX 5,000 for 10 boxes (60 pineapples).

^{xxviii} The cost of hiring land for pineapple was about UGX 300,000 – 320,000 per acre for a period of 5 – 6 years (i.e. one rotation), depending on location. Buying the same acreage of land would cost UGX 1.5 – 2.0 million.

^{xxix} Because the fruits were already harvested, the farmer had a weak bargaining position in this situation and the trader therefore offered a low price.

^{xxx} The study did not collect detailed data on clients and importing countries, quantities of organic coffee exported, cup quality test results, export prices, or export logistics.

^{xxxi} The parishes of Kapteret, Tuban, Ngangata and Sengwel.

^{xxxii} The standard yield per tree was 0.5 kg from the start of the project up to 2004, when it was adjusted to 1.0 kg based on a sample from only eight trees. The standard yield is in principle adjusted each season according to rainfall conditions, but has not been done in practice. Two weather stations were set up in 2006 to help in these yield estimations. The high potential errors involved in applying the same yield per tree figure to all coffee farms questions the effectiveness of this approach to controlling for adulteration. The inaccuracy of the yield estimates are also indicated by the large differences between estimated production and actual deliveries. Some farmers complained that their quotas were not adjusted upwards after they expanded their coffee farms. Similar problems of controlling for adulteration were observed in the Biofresh case. Generally speaking, while integrity at a scheme level was probably demonstrable, there were problems verifying integrity at a more detailed individual level.

^{xxxiii} The same pattern was observed in 2004/05 when Kawacom started buying on 18th August at UGX 1980 per kg parchment, while middlemen offered UGX 1700. Kawacom stopped buying at the end of December 2004 at UGX 2000 by which time middlemen had raised their price to UGX 1950. We assume here that middlemen only paid the latter price for a quality comparable

to Kawacom's standards. We also need to mention that middlemen buy a large part of the coffee in semi- or unprocessed form at lower prices in the hope to earn a profit on the processing (processing entails risk related to uncertainty of quality and price movements). Farmers also accused middlemen for profiting by cheating on weights and measures.

^{xxxiv} The information in this paragraph is based on Gibbon and Bolwig (2007).

^{xxxv} The yields were comparable to those found among Kenyan smallholders in the 1980s (605 kg clean coffee per hectare) but far below those realised on the best estates (2000 kg), according to Carr (1993: 32).

^{xxxvi} The 'real' yield effect of the berry borer and leaf rust is often exaggerated.

^{xxxvii} Improved market conditions in Kapchorwa have been the result not only of the organic project but also of improved road infrastructure and, more lately, rising international coffee prices.

^{xxxviii} A coffee plantation today costs UGX 150,000 (for one local area unit; 6 x 12 paces), against UGX 30,000-40,000 before 2001. Land without coffee costs UGX 70,000-80,000, against UGX 30,000-40,000 (before 2001 the cost was the same whether or not there was coffee on the land, since people would uproot the coffee and plant other crops).

^{xxxix} Work done by children and hired labour was not considered in these estimates.

^{xl} All the interviewed women intercropped beans with coffee.

^{xli} In Kayunga these were maize, beans, pawpaw, banana, vanilla, coffee, cattle, goats, pigs, and milk.

^{xlii} A male farmer observed that the higher pineapple income has improved their ability to keep their maize harvest until late in the season when prices usually rise.

^{xliii} A female focus group observed that 'in some families the wife and husband can talk about things, in others the husband is like a dictator'.

^{xliv} The disease has seriously affected banana production in Central Uganda and it now seems to have spread to the eastern parts of the country.

Development through organic trade

Since the early 1960s there has been a growing market in Europe, Japan and the USA for products grown in a sustainable manner and without the use of agro chemicals. The organic market has grown from US\$ 13 billion in 1998 to US\$ 25 billion in 2005. This is due to the increasing environmental concerns by the consumers in these developed countries. As such, they are willing to pay premium prices for certified organic products. Slowly but surely, governments, as well as development cooperatives, are recognising the contributions that organic agriculture can make to environmental, health, bio-diversity and food security issues.

The aforementioned situation made for an ideal opportunity for African countries to find premium export markets. Thus, the EPOPA programme – Export Promotion of Organic Products from Africa – was birthed by SIDA in 1997.

The first two phases of EPOPA-programme from 1997-2001 and from 2002-2004 proved to be successful. In 2004, more than 29,000 smallholders participated. It is encouraging to note that the first two projects initiated by EPOPA, involving another 30,000 farmers, are self-sustaining to this day.

The price that the farmers receive for their cash crops is 15 to 40 percent higher. Many farmers report a significant increase in productivity due to more intensive crop management measures. The farmers also produce their own food organically.

The farmers also appreciate the extra attention given to them by the extension workers and generally respond to that by caring more about farming.

The higher prices are not achieved by the organic qualification only but also by better quality products and in some cases, by more direct trading structures. In one project, the exporter is also on the fair trade coffee register. These three aspects together resulted in a 50 to 100 percent increase in income.

Read more about EPOPA at: www.epopa.info



EXPORT PROMOTION OF
ORGANIC PRODUCTS FROM AFRICA