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Methodological issues of an impact evaluation of development support in agriculture

A case study on BTC projects in Benin[1]

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Content

List of acronyms

Abbreviation	Explanation
CEV	Validation Committee (Comité d'Étude et de Validation)
IC	Community Investment (Investissement Communaux)
MFI	Microfinance Institution
MIP	Microproject (Microprojet)
PEA	Large-scale Projects (Projet d'Entreprenariat Agricole)
SCDA	Community Department for Agricultural Development (Secteur Communal pour le Développement Agricole)
SONAPRA	National Union for Agricultural Promotion (Société Nationale pour la Promotion Agricole)
UFR	Regional Functional Unit (Unité Fonctionnelle Régionale)
URP	Regional Union of Producers (Union Régionale des Producteurs)

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Abstract

We attempted to investigate the impacts on enterprise performance of two agricultural subsidy projects carried out by the BTC-Benin in 2008-2015. During the working process we encountered several problems. First, the data on the activities of entrepreneurs is incomplete and of poor quality. Second, there are various methodological problems related to the design of the projects that do not allow a clear identification of control and treatment groups for the projects. As a result, we cannot infer any observed difference in performance of entrepreneurs to the project. We were therefore not able to assess the impact of these past projects. Instead, we successfully launched a collaboration with BTC-Benin to design a randomized impact evaluation on a new project that started in January 2016. In order to facilitate the design of the evaluation on the new project this paper concentrates on two issues. First, we present a background on the agricultural crops supported by BTC-Benin as well as some stylized facts about access to external finance in Benin. Second, we analyze the selection process of beneficiaries for the projects by BTC-Benin in 2008-2015. Subsequently, in a companion paper we estimate the determinants of land productivity.

JEL Classification: Q12, Q14, O16
Keywords: Agriculture, Benin, External financing, MSMEs

0 | Introduction

In Benin, farming is the main source of income for a considerable part of the population and access to finance is still being a barrier for SMEs growth in the agricultural sector (Sossa, 2011). The Belgian Technical Cooperation (BTC) had implemented in the course of 2008-2015 two development projects in two regions of Benin (the Mono-Couffo (MC) in the South; and the Atacora-Donga (AD) in the North), which are among the ones with the highest poverty rates in the country. The projects give subsidies to selected applicants (individuals and groups) with entrepreneurial activity in the sectors of cashew, rice and vegetables. Targeted were enterprises which are either involved in the production of those crops, in the intermediate processing of the products or in their commercialization. In addition, BTC initiated a number of investments at the community level.

Subsidizing agricultural production is motivated by existing market imperfections of various types, especially those which constrain small entrepreneurs from having access to credit. While the production of credit-constrained entrepreneurs may in principle be expected to increase with subsidies, given the high returns on available investment opportunities, this is not necessarily a general result. There are indeed potential sources of inefficiencies which can be unleashed by subsidy interventions: one is the question of additionality, or the substitutability between the subsidy and other types of existing financing, formal or informal; if, for a given beneficiary, the subsidy fully substitutes for existing external financial sources, or even for savings ultimately devoted to the same prospective investment projects, the expected effects on output may be weak or just displaced through time. The effect of subsidies might also be mitigated by the nature of risks faced by agricultural entrepreneurs: subsidies only weaken the financing constraint but do not change the nature of risks nor insure against them. Nor can they improve per se the entrepreneurs' technical and managerial capacities or the distortions in input or output market.

Initially we aimed to evaluate the impact of these BTC projects on the performance of the beneficiaries but we encountered several problems. First, the data on the activities of entrepreneurs is incomplete and of poor quality. Second, there are various methodological problems related to the design of the projects that constrained us in defining the control and treatment groups for the interventions. As a result, we were, unfortunately, not able to assess the impact of the BTC's support on the performance of the beneficiaries. Instead, we successfully launched a colaboration with BTC-Benin to design a randomized impact evaluation on a new project that started in January 2016. In order to facilitate the design of the evaluation on the new project, this paper concentrates on two issues on the Mono-Couffo region, due to data availibility. First, we present a background on the agricultural crops supported by BTC-Benin as well as some stylized facts about access to external finance for enterprises in Benin. Second, we analyze the selection process of beneficiaries for the projects by BTC-Benin in 2008-2015. In a companion paper, we estimate the determinants of land productivity.

The rest of the paper is structured as follows. In Section 1 we provide a review of the recent literature on the expected effects – and observed pitfalls – of subsidies in an agricultural context. To put the BTC projects in context, Section 2 provides a brief background on the rice and vegetables sectors in in Mono-Couffo. Morever, we present some stylized facts about access to credit for enterprises in Benin. We finally present the specifics of the two BTC projects. Section 3 discusses the selection process of beneficiaries. The last section concludes.

1 | Related Literature

Lack of external finance, particularly for small and medium-sized enterprises (SMEs) in Africa, has been identified as a serious barrier to economic growth (Beck and Cull, 2014), despite the high marginal return on investment especially at very low levels of capital (Grimm, Krueger and Lay, 2011). The research on access to finance for medium and small enterprises in developing countries has been extensive and focuses on three aspects — the access to formal and informal credit, conditional cash transfers and provision of grants (subsidies) to SMEs. The dominant line of research has been on the access to informal and formal credit (e.g., Banerjee and Duflo, 2011; Guber and Roubaud, 2011), whereas the research on the provision of grants (subsidy) or cash transfers has been rather scarce (e.g., de Mel, McKenzie and Woodruff, 2008; Fafchamps et al., 2011; Beaman et al., 2014; Berge, Bjorvatn and Tungodden, 2015).

Two separate lines of research in agricultural finance have recently emerged - the literature on subsidies for agricultural inputs such as fertilizers (e.g., Duflo, Kremer and Robinson, 2010) and the importance of micro-insurance in a rural setting as a complement or substitute to the provision of credit (Giné, Townsend and Vickery, 2008; Hill and Robles, 2011; Macours, Premand and Vakis, 2012). For instance, Karlan et al. (2014) conducted an experiment with a random assignment of (i) cash grants, (ii) grants of, or opportunities to purchase, rainfall index insurance, or (iii) a combination of both to small-scale maize farmers in northern Ghana. The paper tests the importance of capital constraints and uninsured risk separately and together as financial market imperfections hinders the optimal investment by smallholder farmers. In year 2 and year 3 of the experiment the insurance was not offered for free but at a randomized price varying from one eight of the market price to the full market price. The results of the paper show that the insurance led to a larger agricultural investment and riskier production choices in agriculture. Furthermore, the uninsured risk is seen as the binding constraint for farmer investment. Therefore, when farmers are insured against the uncertainty they face in their activity, they are able to increase expenditures on their farms.

In addition to the considerable importance of lifting credit constraints for SMEs in developing countries, acquiring entrepreneurial skills is as important as access to credit in order for SMEs to be able to grow (e.g., Karlan and Valdivia, 2011; Giné and Mansuri, 2014; Berge, Bjorvatn and Tungodden, 2015). Tjernstrom, Carter and Toledo (2013), for example, conducted a randomized controlled trial within a program focusing on profitable value chains in the agricultural sector of Western Nicaragua. They provided marketing support, co-investment opportunities as well as technical assistance and training to agricultural households. A random sample of potential beneficiaries was selected and half of them were selected for the program in the first year and the other half for the program in year 3. This phase-in design of the experiment allowed to study whether there was a continuous effect of the treatment on increase in farm capital and incomes from the activities targeted by the program. There was no impact on household consumption patterns, possibly explained by the fact that households are reinvesting the increased income into their farm. An analysis on the heterogeneity of the impacts by income quantile shows that the programme benefited mostly those agricultural households in the upper quantile of the income distribution.

Following the above line of argumentation and given that the BTC gives a subsidy to the selected beneficiaries, potential research questions could be: Are those enterprises applying for the subsidy doing so because they are subjected to a binding credit constraint? And if they are not, is there a crowding-out of formal finance? Or is it rather an inter-temporal substitution of the financing source? In the first case, giving a subsidy can have a positive impact on agricultural entrepreneurship if there

is evidence that the applying enterprises have credit constraints. The entrepreneur might be credit constrained for various reasons: e.g., due to quantity rationing by the lender, transaction costs linked to the borrowing/lending operation itself, etc. (Fletschner, Guirkinger and Boucher, 2010). In the second case, the subsidy causes inefficiency in the rural financial market by crowding-out existing formal lending sources. In the third case, the subsidy also causes inefficiency in the rural financial market by providing an alternative financing source which depends on the degree of impatience of the entrepreneur, for example, to expand his entrepreneurial activity. In addition, the non-divisibility and irreversibility of an investment could be one explanation why entrepreneurs might not undertake an investment under incomplete financial markets (Fafchamps and Pender, 2012). Quartey et al. (2012) also point out that access to credit is not sufficient for productivity: what is also needed is a more efficient pricing and marketing of the agricultural production. Moreover, the level of productivity is not only dependent on physical capital but also on financial assets and social capital (Fafchamps and Minten, 2002), also in the particular context of Benin (Fafchamps and Gabre-Madhini, 2006).

2 | Background

2.1 Background on the Rice and Vegetables Sectors in Mono-Couffo[2]

The region Mono-Couffo is located in South-West of Benin. It includes twelve administrative communes: Aplahoué, Athiémé, Bopa, Comé, Djakotomè, Dogbo, Grand-Popo, Houéyogbé, Klouékanmè, Lalo, Lokossa and Toviklin. As a starting point, we explore a recent census[3] of entrepreneurs active in the sectors of rice and vegetables, conducted by the BTC-Benin and the Ministry of Agriculture.[4] The census covers the three agricultural seasons in the period 2014-2015, with the first season being from March to July (big raining season), the second from August to October (small rainy season) and the third from November to February (dry season). There is heterogeneity in the number of producers by commune, even after taking into account the total population in the commune. The most represented prodcucers in the census as a share of the total population by commune are from Grand Popo (2.29%), Comè (1.87%), Athiémé (1.79%) and Lokossa (1.73%). Compared to the fraction of male and female population by commune, the distribution of the producers by gender in the twelve communes shows that male entrepreneurs dominate in the communes Toviklin (78%), Grand Popo (63%), Dogbo (61%), Lokossa (61%) and Djakotomè (60%). The communes with a more balanced distribution of male and female entrepreneurs are Aplahoué, Athiémé, Bopa and Lalo.

The census data shows a pattern of specialization in the production of few vegetable crops – 53% of the producers in the first agricultural season produce one or two vegetable crops and 25% do not produce vegetables. Overall, in the first agricultural season 72% of the producers produce vegetables, 10% produce rice, 3% produce vegetables and rice and 16% do not produce rice or vegetables (Figure 8A). Most producers are only active in the first agricultural season, which is in particular the case in the communes Bopa (80%), Comè (60%), Toviklin (60%) and Djakotomè (52%). There are also communes in which there is a high fraction of producers producing in the first as well as in the second

2 This section relies heavily on recent reports from CARDER Mono-Couffo: CARDER Mono-Couffo (2013a) on the rice sector and CARDER Mono-Couffo (2013b) on the vegetables sector.

3 During our recent exchanges with BTC-Benin we understood that this census did not cover a few communes.

4 In order not to overburden the main text with figures and graphs, the text below refers to the material provided in Annex 1 (Section 2.1).

agricultural season – Klouekanmé (50%), Grand Popo (41%), Djakotomè (33%) and Toviklin (32%) (Figure 9A).

The cummulative distribution of total disposable land by number of crops shows that by increasing the number of crops the distribution curve becomes flatter; the more disposable land a producer has, the higher the number of produced crops. The mean disposable land for each one of those categories of producers (no producers of rice and vegetables; producers of rice; producers of vegetables and rice) shows that the producers producing vegetables and rice have on average considerably more hectares of disposable land when compared to the producers of only rice, vegetables or none of those (Figure 8A). However, we do not find evidence in the census for complementarity in production when more than one crop is produced, e.g., the production of tomatoes does not increase when there is also a production of long or of round pepper. However, when the hectares of cropped land are considered there is complementarity, e.g., with an increase in the hectares of cropped land with tomatoes there is an increase in the cropped land with long or round pepper. This pattern however does not hold when the land is cropped with rice or crin crin.

The communes with the most equal distribution of disposable land[5] as proxied by the fraction of producers in the ten quantiles of the distribution of disposable land are Djakotomè, Dogbo and Toviklin; those with the most unequal distribution of disposable land are Houeyogbe, Klouekanmé and Lalo. The cumulative distribution function for the cropped and disposable land by level of education and gender shows that entrepreneurs with higher education and males have more cropped and disposable land than females and entrepreneurs with low level of education. The mean disposable land by commune is 1.90 ha. The communes which are noticeably above this mean are Aplahoué (3.4 ha.), Athiémé (2.5 ha.), Bopa (2.5 ha.) and Lalo (2.4 ha.).

We close this section with three other interesting structural caractheristics. First, the majority of entrepreneurs (82%) is not having a membership in a group (groupement de basse) or cooperative, with the communes Houeyogbe (49%), Djakotomè (29%), Athiémé (27%) and Lokossa (21%) being with the highest membership rate. However, there is no difference in the membership rate between male and female entrepreneurs. Second, the age profile of entrepreneurs by commune is quite similar, with the entrepreneurs in the age interval 30-50 dominating in the sample. There is no considerable difference in the age profiles between male and female entrepreneurs. 63% of the entrepreneurs in the census have no education. Third, the communes Athiémé, Grand Popo, Houeyogbe and Dogbo have also a share with entrepreneurs who are litterate, with primary, secondary or/and higher education – their overall share is 52%, 70%, 48% and 41% correspondingly. In addition, 48% of the male entrepreneurs have no education compared to 80% for female entrepreneurs.

2.1.1 Background on the Rice Sector

Benin has a relatively marginal position in rice production in West Africa - in 2012, for instance, the rice production in Benin accounted for only 3.15% of total rice production in region. Nevertheless, given that there is unexploited potential for the production of rice and that Benin is highly dependent on imports of rice to satisfy national demand, there is scope for improving this

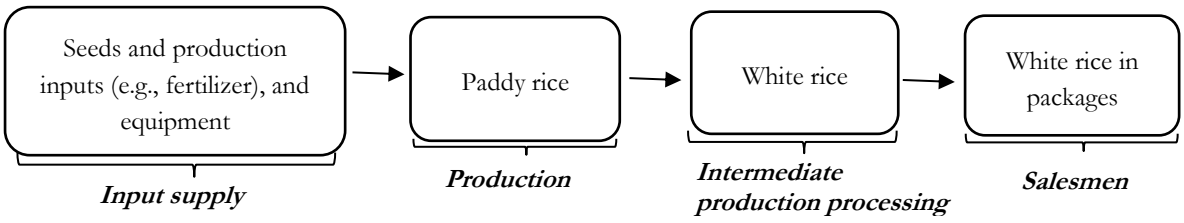
5 The definition of disposable land according to the questionnaire on the agricultural census is: the sum of all the available land, not including the land with perennial crops (plantations) or other substantial investment. (*La superficie totale disponible ou exploitable est la somme de tout le disponible foncier, non compris les terres occupées par des cultures pérennes (plantations) ou d'autres investissements lourds.*)

marginal position of the country.[6] Being aware that it is vital to strengthen the performance of the sector, the Government of Benin decided in 2006 to include rice among the 12 crops promoted through the Strategic Plan for the Recovery of the Agricultural Sector (SPARS). In the same way, a national strategy for rice development in Benin was introduced in 2011 with the overall objective to gradually increase the production of paddy rice from 72,960 tons in 2007 to 600,000 tons in 2015. The production of rice has also been promoted through the Agricultural Diversification Support Project (PADA) in partnership with the World Bank.

Comparison of the median volume of rice production between Benin and Mono-Couffo in the period 1995-2012 shows an increasing trend, with the gap in median productivity between Mono-Couffo Benin as a whole narrowing since 2007 (Figure 11A). In the departments of Mono-Couffo the rice sector plays a leading role for households' well-being as rice is not only one of the most produced crops but also one of the most consumed (CARDER Mono-Couffo, 2013a). Based on information from the Regional Council of Rice Farmers in Mono-Couffo, there is a total of 3,200 rice farmers of whom approximately 50 percent are women. The potential of land favorable for the production of rice is estimated at 27,000 ha. of the naturally irrigable zone of the river valley of Mono and 20,000 ha. of lowlands, which represents approximately 10% of national potential (CARDER Mono-Couffo, 2013a).

The volume of production across the 12 communes is low, with the highest production over the period 1995-2012 registered in the communes Dogbo, Bopa and Athiémé, which also show a significant positive trend from 2007 onwards. The hectares of cultivated land with rice also show variability across Mono-Couffo – the commune with the highest amount of hectares cropped with rice is Dogbo, and after 2006 one also observes an increase in the hectares of cropped land with rice in Bopa and Athiémé (Figures 12A-15A).

Figure 1: Main actors in the value chain – rice sector



Along the value chain in the sector of rice there are four types of entrepreneurial activities that can be distinguished (Figure 1). The elements in the value chain are interrelated and a deficiency in one leads in a deficiency in another, which eventually results in a market distortion in the particular sector. If, for instance, the amount of white rice is insufficient to satisfy the demand of end market or the distribution channel is not functioning efficiently enough to supply the white rice to the market, there will be a difference between what is supplied on the market and what is demanded by consumers. In equilibrium, the supply and demand of rice have to be equal, and if the demand is bigger than the supply, this difference has to be compensated by supply from an outside market (imports).

6 As Benin is a member of the West African Economic and Monetary Union (WAEMU) and of the Economic Community of West African States (ECOWAS), it is also part of a customs union and subjected to setting a common external tariff in the region. Unfortunately, the Beninese tax policy in this setting has not been able to promote the competitiveness of local rice production. However, like other least developed countries (LDCs), Benin may still impose a tax on rice imports up to 35%. This is an indicator that there is still a room for government action to better protect local rice entrepreneurs (CARDER Mono-Couffo, 2013a)

2.1.1.1 Production

The three key factors which are vital for the production of rice are the type and quality of soil, the inputs used such as seeds, fertilizers and machinery, and the climatic conditions. The annual production of the departments in the given zone of BTC projects accounts for 2% of national production. The production in the two departments in 2012/13 was distributed among five main varieties - IR841 (60%) and Nerica L20, Nerica L14, Nerica 1, Nerica 4 (40%) (CARDER Mono-Couffo, 2013a).

The rice production is supported by a set of upstream actors in the sector: seed, fertilizer and herbicides suppliers, and suppliers of equipment/machinery. Producers are organized from the municipal level to the regional level. However, professional organizations are underdeveloped for intermediate production processing and commercialization. In Mono-Couffo, there is a total of fifty suppliers of rice seeds, half of whom operate in Dévé. The operations of seed suppliers are subjected to a regulatory framework. After the suppliers of seeds have completed the certification procedure, the national union for agricultural promotion (Société Nationale pour la Promotion Agricole – SONAPRA) handles the purchase of certified seeds and makes them available to rice producers through the community department for agricultural development (Secteur Communal pour le Développement Agricole - SCDA) (CARDER Mono-Couffo, 2013a).

One of the biggest challenges that the producers of rice face is the type of irrigation that will provide sufficient water for the crops. The irrigation systems in Mono-Couffo are in fact quite diverse and there is scope for improvement in the existing irrigation systems as well as for exploitation of alternative ones. There are four types of irrigation systems:

- strictly rainfed rice production system
- rice production system in wetlands (inland valleys) (*Irrigation mechanisms with total control of the water supply*: water pumped from permanent water grounds; gravity irrigation downstream; artesian wells; *Irrigation mechanisms with partial water control*: recapture of watersheds runoff; facilities for water retention)
- rice production system in undeveloped wetlands
- rice production system in mangroves

Despite the presence of private actors such as ProDogbo (Dogbo) and CEFACOM Azovè (Aplahoué), both specialized in manufacturing of equipment production and processing, the mechanization of rice production in Mono-Couffo is still very limited and needs to be strengthened (CARDER Mono-Couffo, 2013a).

In sum, the main drawbacks for the production of rice are related to the lack of specific fertilizers for the local varieties that are planted, to the uneven distribution of the stocks of the fertilizers across the communities and to delayed delivery. This creates favourable conditions for informal speculative sellers who stock the fertilizers under bad conditions and harm correspondingly the quality of the supplied fertilizer. In addition, there is a weak match between the equipment for production and the equipment for intermediate processing of rice, which is coupled with an unstable number of private users active in the mechanization of rice production. There is also insufficient progress in the exploration of the potential of flat floodable lands in Mono-Couffo, the lowlands and other favourable types of toposequence for pluvial rice cultivation as well as bad management of the available water resources (inefficient irrigation techniques). Finally, rainfall uncertainty also limits the production of rice in some communes.

2.1.1.2 Transformation

The rice processing activity is an essential stage in the production of consumable rice - it allows to provide the public with a consumable product, creates added value to the paddy rice, which consequently increases the value of production. In this activity there are two categories of entrepreneurs operating in Mono-Couffo - rice mills and husking service providers. In the region there are in total five mills which also collaborate with each other. These include the rice mills of the CRR (Manonkpon), ESOP12 (Lalo), PAID (Dogbo), the group Wodou (Comé) and FIOKAS (Grand Popo). The husking services exist in two forms: fixed and mobile. In Mono-Couffo twenty husking machines (mobile or not) operate under private operators and organizations, which is still insufficient number given the demand for rice in the two departments. The existing practice is to move mobile husking machines from one municipality to another, and for fixed shellers the paddy rice is brought to the machine. The shellers have a theoretical capacity of 700 kg./ha., but the actual processing is on average 300-400 kg./ha. Those machines are, on one side, often producing a husked white rice containing lots of chips and, on the other side, often break up (average rate of breakage during the paddy rice processing: 35%). This high rate of breakage is mostly not linked to the quality of the husking machine but to the low level of competence of the machine operator (CARDER Mono-Couffo, 2013a).

2.1.1.3 Commercialization

The distribution of rice to the various markets in the departments of Mono-Couffo is mainly done by women. What one observes in the structure of the rice markets in Mono-Couffo is that those markets are supplied primarily with imported rice and that the local rice has a minor share. The competition from imports out of neighbouring countries has also direct implication for the market price of rice. From the point of view of the consumer, the low quality of the local production is often described as: (i) not sufficiently dry, (ii) non-homogeneity of production (varietal mix), (iii) high content of starch (failing of the maturation of the grain) and (iv) high level of impurity (e.g., sand). The majority of the production, with the exception of rice processing factories, is being processed into (not strong) white rice. Furthermore, the local rice is sold in bulks or in packages of 1 kg. and 5 kg., and also sacks of 5.25 kg. and 50 kg. which are generally without brand label. Two exceptions are the local rice labels 'Délice' and 'Riz nature' (CARDER Mono-Couffo, 2013a). Initially, the products of 'Délice' were sold in Cotonou which, however, resulted in very high transportation costs. Subsequently, with the initiation of market promotion actions, the sale of 'Délice' in Mono-Couffo was promoted. The sales increased by 68% and nowadays about 70% of the production is sold locally, reducing transport costs and leaving a higher margin for producers (Flachet et al., 2013).

2.1.2 Background on the Vegetables Sector

Vegetables are classified into three major groups: *fruit vegetables*: tomato, pepper and okra, etc.; *leafy vegetables*: large nightshade, amaranth, fiddle, cabbage, lettuce, etc; and *vegetables - roots*: onion, carrot, etc. (CARDER Mono-Couffo, 2013b). The vegetables sector plays a leading role in the economic development of Mono-Couffo as it employs a high fraction of the population in the two departments. The list of producers in 2011 by the Regional Council of vegetable producers in Mono-Couffo (CRM -MC) counts a total of 5,406 producers, of whom 2,665 (49%) are women.

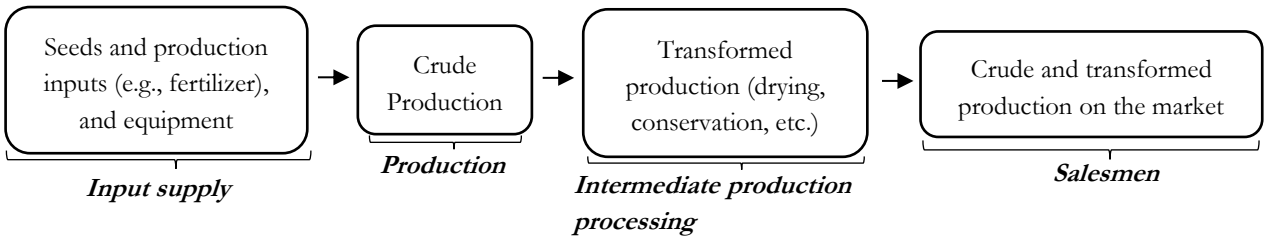
The production of tomatoes in Benin is clearly dominating the production of the vegetables sector in the country. The cropped-land size for okra and onion are relatively less important, compared to the ones of tomatoes and pepper. In Mono-Couffo, the median productivity of tomatoes has been higher than the national level. This trend is, however, not true for okra, in which Mono-Couffo lags

behind the country median since 2007. The productivity in the production of pepper has been above the median for Benin since 1995 and has been experiencing a sharp increase since 2010 (Figure 16A, Figure 21A, and Figure 26A).

In the departments of Mono-Couffo, the production of tomatoes is highest in the communes Klouekanmé, Lalo and Aplahoué. With an increasing trend from 2008 onward, the communes Djakotomè and Lalo have the highest production of pepper as well as the most hectares of land cropped with pepper (with a decreasing trend for Lalo and Dogbo after 2005). The communes that dominate in the production of okra are Klouekanmé, Bopa and Comè with a sharp increase from 2007 onward. In addition, one observes a stepwise decrease in Aplahoué, Athiémé, Djakotomè and Lalo since 1994 in the production of okra as well as in the hectares of cultivated land with the crop. The commune experienced the same pattern in the production and the hectares of cropped land, but after 2007 one observes a sharp increase in both measures. One particular observation for the production of okra is that between 2004 and 2006 there was a stagnation in the production as well as in the hectares of cropped land in both departments (Figures 17A-20A, Figures 22A-25A, Figures 27A-30A).

The value chain of the production in the vegetables sector resembles the one of the rice sector, with one substantial difference at the level of transformation (Figure 2).

Figure 2: Main actors in the value chain – vegetables sector



2.1.2.1 Production

The input suppliers of Mono-Couffo supply commercial seeds not only in the departments but also in the shops in Togo (Lomé, Anèho) and Cotonou. Moreover, many suppliers are turning to Togo to resupply with fertilizers. In general, the inputs in Mono-Couffo are more expensive than in Cotonou and Lomé. In addition, in Lomé a producer can find all the desired inputs in a single shop, instead of going to several shops like in Cotonou for example. This explains why Lomé is the preferred destination for producers to supply themselves with inputs. In the two departments, the commune Dogbo is considered to be the most popular area of supply of fertilizers (CARDER Mono-Couffo, 2013b).

Organic fertilizer is generally used in its raw form as poultry or cattle excrement. The conventional supply areas for organic fertilizers are Sè, Ouidah, Hêvié and Azovè. The offer is in general inadequate and one has to order at least three months in advance, with prices rising as the planting season approaches. This induces producers to look for markets outside - Aklakou, Vogan, Affagnan, Anèho (all being Togolese cities). As a result, farmers are often forced to buy in the informal circuit relatively expensive fertilizers that are often unlicensed and have low quality (CARDER Mono-Couffo, 2013b). Linking producers with input suppliers is therefore mainly motivated by the lack of access to producers of agricultural input. This appears to be especially challenging in the case of mineral fertilizers, mainly due to: (i) a lack of specific agricultural inputs in general in Benin, particularly near the biggest production areas, (ii) a lack of information (on the side of producers and suppliers) on the supply and demand, (iii) a low level of organization of the producers, hampering their ability to

signal the required volume of input to suppliers and arrange transportation at a lower price, and (iv) pre-financing problems of the business of suppliers and producers (CARDER Mono-Couffo, 2013b).

The unrestrained use of pesticides is a serious concern for quality of the vegetable production not only in the department of Mono-Couffo but also in Benin as a whole. Aware of the potential risks of the uncontrolled use of pesticides, an awareness campaign was organized within the framework of the BTC project FAFA (La Facilité d'Appui aux Filières Agricoles) in Mono-Couffo to inform and educate the people of Mono-Couffo on the use of pesticides. In addition, there was a contest in songs in the local languages that was organized in 2012 to raise awareness about the harms of pesticide use as well as several emissions programmed on five radio stations in the region to make recommendations to producers. Meanwhile, various analyses were performed to determine the rate of pesticide residues in vegetables in order to identify the products which cannot be consumed (CARDER Mono-Couffo, 2013b).

At the start of FAFA the most important problem of the sector was the low water control. In the production process, two types of pumps are used for irrigation in Mono-Couffo - fuel pumps and electric pumps. These have the advantage of reduced irrigation costs, but there are also some constraints in particular on the use of electric pumps: (i) poor access to electricity, (ii) very short life of the pumps because of frequent breakdowns: 1-2 years, (iii) lack of specialized stores for pumps, (iv) increase in gasoline prices, (v) frequent faults in the supply with electricity. There is in general a lack of funds for the purchase of equipment, unavailability of adequate equipment at the local level, a need for capacity building, difficulty to produce quality packages at reduced prices, insufficient quantity of raw materials at certain times, etc. which all together result in a lower competitiveness of local products over imported products (CARDER Mono-Couffo, 2013b).

2.1.2.2 Transformation

Transformation is regarded as the activity in the value chain which requires a considerable action by policy makers as processing of vegetables' production in the departments of Mono and Couffo is not developed. The vegetable products most commonly subject to transformation are long pepper, round pepper and tomato. Two categories of actors in the transformation (production processing) activity are identified: the traditional and the modern transformators, with three common forms of transformation:

- Drying: Natural drying in the sun is the method traditionally used by processors. In Mono-Couffo drying is mostly done with chilli (round pepper and long pepper). It is usually done at the production site by exposing the peppers to sunlight and wind for several (8-10) days. Natural drying in the sun is simple and cheap (free energy), but it causes loss of vitamins and carries serious risks of contamination. Thus, dried chilli is packed in special (jute) bags and stored mostly at home. However, the storage of dried chilli in homes is a source of nuisance for transformers and their household because they are subject to strong and pungent odors, suffocation and recurring sneezing. There is therefore a need for building appropriate storage facilities.
- Dried powder: Vegetable crops are minced and mixed in precise proportions with dried spices, and packed in small jars and bottles for trade on the market. For the dry pepper, traditionally, the grinding is done on wheels or grain mills.
- Conservation/pasteurization: This method of transformation relates to the tomato puree, which is a more sophisticated technique compared to drying and powdering. The raw tomatoes are first cooked, and then the obtained liquid is packaged in small bottles, and sealed. This tomato paste can be preserved for consumption from 6 to 12 months.

2.1.2.3 Commercialization

The exchange of information between the actors in the value chain is essential for the final product to reach the market. The BTC FAFA project in Mono-Couffo used three approaches to facilitate the relationship between producers, intermediate production processors and salesmen: (i) meetings between buyers and sellers, (ii) market surveys conducted with producers and (iii) participation of vendors at fairs. The major problem that entrepreneurs in the vegetables sector face is information asymmetry with respect to the market price – even in nearby markets – smaller entrepreneurs are in general in a weak negotiating position and cannot compete with the relatively low prices offered by wholesalers. This problem is exacerbated during the rainy season when supply exceeds demand, as a result of which the wholesalers dictate the price (Flachet et al., 2013).

The commercialization of the produced and transformed vegetables includes five groups of stakeholders: collector (autonomous collector and collector-courtières), wholesalers, semi-wholesalers, retailer and consumers. The majority of private entrepreneurs in Mono-Couffo work with retailers. These are found in the major centres of vegetable production in Mono-Couffo or sometimes outside the two departments. The retailing process is network based and relies on friends, relatives or fellow members of the same community. Retailers purchase the products in cash or on credit, depending on the trust between retailer and producer (or the production processors). The retailer is paid on the basis of the difference between the cost price and the selling price. When the trust is established, the intermediary becomes loyal customer of the store and can begin to take some stock on credit and repay at the end of an agreed period. When the stock is not exhausted after some period of time, products are returned to the supplier and exchanged against another product. Besides the opportunity to purchase significant amounts on credit, the end customer benefits from reductions of the purchase price due to the increased quantity of products that can be purchased (CARDER Mono-Couffo, 2013b).

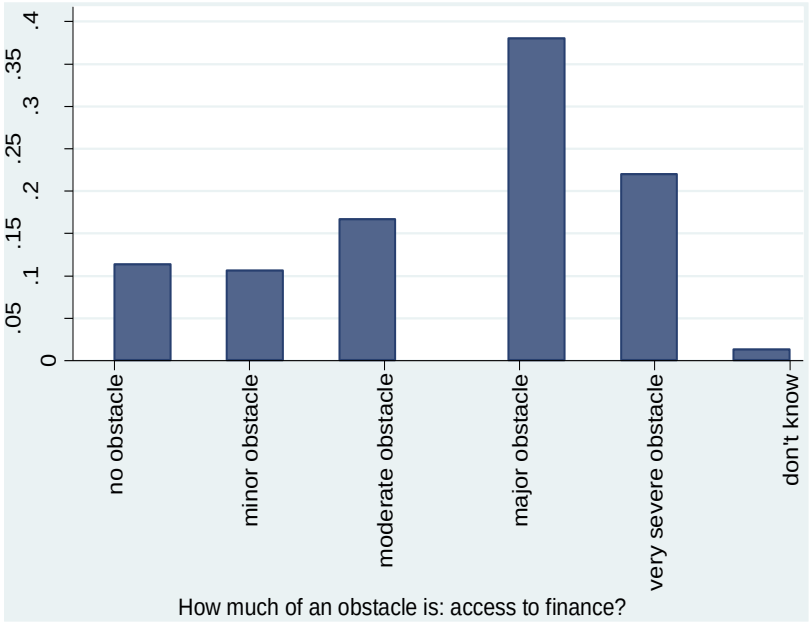
2.2 Access to Credit for MSMEs in Benin and Mono-Couffo

2.2.1 Access to Credit for MSMEs in Benin[7]

Enterprise financing in Benin relies heavily on internal funds (e.g., retained earnings) compared to external funds (credit from a financing institution). Moreover, compared to other countries in Sub-Saharan Africa the importance of internal financing in Benin is considerably higher – around 90%; for comparison the percentage of internal financing for MSMEs in Uganda is 70%, in Tanzania 72%, in Senegal 65%, in Rwanda 70% and Mali (83%) (Figure 31A). Credit to the private sector is still underdeveloped, with the main reason for low formal (bank) lending being the weak financial infrastructure and the business environment. Furthermore, in Benin, bank lending to the agricultural sector in particular is considerably lower (6%) than bank lending to the industry (22%) and services (72%) (Figure 32A). In recent years, however, with the growth of microfinance institutions (MFIs) access to credit for the private sector has improved. This trend despite being favourable for financial inclusion has, however, a negative side as a large number of those MFIs are not officially authorized to operate (IMF, 2016).

7 The figures used as a reference in the text can be found in Annex 2.

Figure 3: Access to finance



Note: The Question asked in the Enterprise Survey is: "Is access to financing, which includes availability and cost [interest rates, fees and collateral requirements], No Obstacle, a Minor Obstacle, a Major Obstacle, or a Very Severe Obstacle to the current operations of the establishment?". The number of enterprises which answered this question is 150.

Source: World Bank Enterprise Survey – Benin (2009).

Access to credit is considered a major obstacle to enterprise development for 39% and 22% of the enterprises from the representative sample of 150 formal enterprises in the sectors of manufacturing and services in Benin in 2009, respectively (Figure 3). Moreover, compared to other potential obstacles that enterprises could face when expanding or starting operations, access to credit is the leading one, with 25% of the enterprises indicating it as the main barrier for their development, more limiting than electricity (16%), the practices of competitors in the informal sector (13%) and tax administration (13%) (Table 8A). In the sample of 150 enterprises, only 59 have a credit line or loan from a financial institution and 64 applied in last fiscal year for new loans or lines of credit. Those that did not apply indicated that there was no need for a loan (32%), the application procedures for loans or line of credit were too complex (18%) or other reasons played a role (24%).

Access to credit can be viewed as a necessary condition for enterprises to provide themselves working capital and means to purchase fixed assets. Nevertheless, the World Bank Enterprise Survey of 2009 indicates that the majority of the interviewed enterprises in Benin rely for less than 10% on external funds, e.g. borrowing from non-bank financial institutions, purchases on credit from suppliers and advances from customers, borrowing from banks (private and state-owned) or borrowing from other sources such as moneylenders and relatives. They are more reliant on internal funds to finance the total amount of working capital. The situation looks similar for the purchase of fixed assets, with the only difference being the own contribution i.e., new equity financing on the side of the entrepreneur (the majority of enterprises indicate a contribution of up to 10%), which is a type of financing missing for working capital (Figure 34A and Figure 35A). Those results therefore reflect the results that 62% from the interviewed enterprises consider the access to credit as a major and severe obstacle for their operations.

Apart from access to credit, competition from informal enterprises appears to be a serious concern for the sample of enterprises in the World Bank Enterprise Survey from 2009. 45% of the enterprises classify informal competition as a very severe obstacle and 21% as a major obstacle. The problem of

informality has been targeted recently by the Beninese government with the adoption of the *entreprenant*, which is a program designed to attract small informal businesses to the formal economy. Benhassine et al. (2015) conducted a randomized controlled trial on the onset of the program to investigate whether by progressively providing additional incentives such as (i) information on the new legal status and its benefits, (ii) plus business training, counselling services and support to open a bank account, and (iii) plus tax mediation services, there would be a higher impact on registration rates. The randomized experiment consisted of 3,600 informal businesses in Cotonou, which were the basis for forming the three treatment groups (corresponding to the three types of additional incentives to the program) and one control group (no additional incentives). After one year of implementation the evaluation showed that the impact on registration rates was highest for the third treatment group which was provided with the three types of additional services (15.8 percentage points), compared to the first (9.1 percentage points) and the second (13 percentage points) groups. Examining more closely the profile of entrepreneurs who decided to register after the experiment, Benhassine et al. (2015) find that those entrepreneurs were male, had higher education, operated outside the Dantokpa market, were not active in the sector of trade, and were similar to already formalized businesses. Yet, even with the provided incentives, the formalization rates did not exceed 23%, potentially explained by (i) lack of proper identification – having a passport or an ID - and (ii) an unfavourable perception of the formalization procedure, seen as complicated, time-consuming and costly.

In sum, access to finance is one of the major constraints for formal enterprises in the sectors of services and manufacturing, and, we can assume in other sectors, such as agriculture. In addition, bank loans to the agricultural sector are proportionally less important than the loans provided to enterprises in industry and services. At this stage it is important to investigate whether enterprises in the agricultural sector are indeed credit constrained, and if they are credit constrained, what is the reason for it – loan conditions, formal status, sector specific features (uncertainty because of the weather dependence of production), etc. Moreover, any intervention aiming to alleviate the constraints related to access to finance needs to understand the role of demand versus supply factors.

2.2.2 Access to Credit for MSMEs in Mono-Couffo

At the time of writing this paper we lack detailed data on access to external finance for MSMEs operating in Mono-Couffo. According to the available information the link between entrepreneurs (especially in production) and MFIs is still undeveloped, despite also the efforts made by the team of the FAFA project. This is mainly a result of the reluctance of MFIs and banks to finance agricultural activities in general and, especially, agricultural production, due to the high probability of default of some producers given the uncertainty in their entrepreneurial activity. The uncertainty in agricultural production is resulting from its high dependency on weather conditions. Another reason relates to the competence of the agents of financial institutions to provide an accurate assessment of credit applications in the agricultural sector. The assessment of the needed investment amount, production records and expense tracking by the potential borrower is often of poor quality. Yet, any real development of the agricultural sector is inconceivable without the involvement of the financial sector (banks and MFIs). The role of banks and MFIs as working capital providers in the sector is vital for the development of the agricultural sector. One, therefore, has to look for mechanisms to improve the link between agricultural entrepreneurs and funding structures (Zinha et al., 2013).

According to Zinha et al. (2013) a large number of entrepreneurs, especially in production, have a low financial capacity. Finding a financial partner willing to provide financing for the purchase of a fixed asset worth 100,000 FCFA or more already poses serious problems, without even considering

the mobilization of working capital. Inputs for one agricultural season, for example for the production of tomato and pepper, amount for instance to over 1,000,000 FCFA/ha. Overall, for the purchase of a fixed asset and the finance of working capital an entrepreneur must find a co-financing party for at least 1,500,000 FCFA/ha. These rough calculations indicate that producers in the agricultural sector are unable to raise sufficient funds to operate at full capacity due to the undeveloped financial infrastructure. This results in underinvestment, despite the high potential for returns that could been generated from the activity.

The involvement of banks/MFIs as lenders to finance the working capital could solve this problem and has to be prioritized in future policy interventions in the financial sector. For policy makers to attract the interest of banks and MFIs, there are several points that have to be taken into account: (i) improving the measurement and assessment of returns on investment in the agricultural sector, (ii) provision of risk-control mechanisms, (iii) mechanisms to reduce credit application fees through joint monitoring of entrepreneurs by intervening parties (banks, MFIs, agricultural organizations, etc.), (iv) making use of economies of scale by consolidating working capital requests through agricultural organizations that would insure against some of the risk and (v) establishment of credit bureaus with records on credit history. There is yet a substantial scope for development of other modes of collaboration between the involved stakeholder groups in order to enhance investment in the agricultural sector (Zinha et al., 2013). In any case, interventions aiming to alleviate the constraints related to access to finance needs to understand the role of demand versus supply factors.

3 | The BTC Projects in Mono-Couffo

Since 2007 BTC-Benin has been supporting development projects in the regions of Mono-Couffo and Atacora-Donga aiming to boost agricultural entrepreneurship in key subsectors like rice, vegetables and cashew. The two main projects on which we focus in this work are La Facilité d'Appui aux Filières Agricoles (FAFA) and La Facilité d'Appui aux Investissements Agricoles (FAIA). Those projects had similar objectives and instruments. The main instruments of the BTC were subsidies to individual and groups of entrepreneurs (MIP "Microprojet"), large scale entrepreneurs (PEA "Projet d'Entreprenariat Agricole") and communes/municipalities (IC "Investissements Communaux").

- MIPs targeted enterprise performance focussing on an increase in income through increased production and sales, as well as better cost control. Those projects had to be carried out by individuals or groups, and the project budget was limited to 10 million FCFA.
- The PEA project supported regulated and formal businesses whose project budget did not exceed 50 million FCFA. Those projects had to demonstrate impact in terms of: addressing one or more major bottlenecks in the development of the sector, creation of direct and indirect jobs, contribution to the local economy (new services generating projects, products or local income, etc.), contribution to the development of cluster effects, etc. A detailed business plan and a co-financing and(or) a relationship with a financial or microfinance institution were prerequisites for applying for this type of BTC support. This type of PEA financing instrument was introduced with the project FAIA.
- The IC instrument supported investments by municipalities for the development of infrastructure and equipment that were likely to increase the competitiveness of the rice and vegetables sectors to the benefit of operating entrepreneurs. With the FAFA Mono-Couffo project, a competitive

approach for identifying, selecting and funding municipal investment projects was developed. This instrument was first implemented in March 2011.

The projects had direct as well as indirect beneficiaries. The direct beneficiaries were producers and their organizations, intermediate production processors, retailers as well as input, machinery and equipment suppliers. The indirect beneficiaries were structures related directly and indirectly to the beneficiary (household, members of an entrepreneurial network, etc.). The number of accepted projects for the FAFA subsidy was 94 – 44 individuals and 50 groups (9 female, 11 male, 22 mixed, 8 others) and 54 for the FAIA subsidy – 47 individual and 7 groups (1 female and 6 male). As evident from Table 1, the number of direct and the indirect beneficiaries with the FAFA project were substantially larger than with the FAIA project, which is a result of the higher number of beneficiaries in the case of the FAFA project.[8]

The average subsidy in both project however is very similar. Looking at the distribution of the subsidy over all beneficiary projects, there is however a difference. The subsidies in the FAFA project follow a rather extreme pattern. The subsidies are clustered around 2,000,000 FCFA – 4,000,000 FCFA and 8,000,000 – 10,000,000 FCFA. Conversely, the subsidies in the FAIA project follow a different pattern – the subsidies lie in the range 4,000,000 - 7,000,000/8,000,000 FCFA (Figure 36A). The distributions of the contributions made by the FAFA and FAIA beneficiaries themselves also differs; the majority of FAFA beneficiaries contributed between 2,000,000 and 3,000,000 FCFA[9], while the FAIA beneficiaries contributed up to 5,000,000[10] (Figure 37A).

Table 1: Project beneficiaries

Instrument	Number of accepted projects for the subsidy	Direct beneficiaries		Indirect beneficiaries		Total amount of beneficiary contribution (FCFA)	Total amount of subsidy (FCFA)
		Male	Female	Male	Female		
FAFA							
MIP	95	868	559	230	255	290,128,288 (3,053,982)	512,517,216 (5,394,918)
FAIA							
MIP	54	97	74	323	369	103,929,547 (1,924,621)	308,507,755 (5,713,106)
PEA	5	5	0	5	15	122,743,352 (24,548,670)	81,819,233 (16,363,847)

Note: In brackets are reported the average amount of beneficiary contribution (total amount of beneficiary contribution/# of accepted projects for the subsidy) and the average amount of the subsidy per accepted project (total amount of subsidy/# of accepted projects for the subsidy).
Source: BTC Benin.

8 In the sample of direct FAFA beneficiaries there is one observation with 286 male and 108 female direct beneficiaries (a union of groups), and another observation with 178 male and 57 female direct beneficiaries (ESOP).

9 In the FAFA case there is one outlier with respect to the beneficiary contributions – the Regional Association of Rice Entrepreneurs in Mono-Couffo (Conseil Regional des Riziculteurs du Mono Couffo - CRR) – for a project in transformation; beneficiary contribution = 30,100,000 FCFA. This outlier is also acknowledged in Figure 36A; the straight line represents the distribution of the FAFA beneficiary contribution without this observation.

10 Contribution in percent of the total amount of the proposed project on the side of the entrepreneur (MIP): (i) male group – 20%, (ii) female group – 15%, (iii) mixed group – 18%, (iv) male entrepreneur – 20%, (v) female entrepreneur – 15% and (vi) young entrepreneur – 10%. Contribution for PEA – 25% (data for the FAIA project).

3.1.1 The Project FAFA (La Facilité d'Appui aux Filières Agricoles)[11]

The promotion of the agricultural sector is the main focus of the Strategic Plan for Agricultural Sector Recovery (SPASR) in Benin.[12] The rice and vegetables sectors are among the sectors with high potential for intensification of production of smallholder farmers and correspondingly for improving their profitability. Despite the investments made by the Beninese government, producers' needs for basic infrastructure and equipment, including agricultural mechanization, water management, conservation and processing of products, are far from being met. In addition, the financial institutions cannot fulfil the financial needs of family farmers for medium and long-term loans. Apart from the cotton sector, where the default rate on credits is low due to the structure of the sector and the control over the operating units, banks are reluctant to finance the sector of food crops because of its high risk. The FAFA Mono-Couffo project focused therefore on the capacity building and the effective mobilization of public and private stakeholders to improve the productivity and profitability of rice and vegetable sectors in Mono-Couffo. It was implemented over the period 2008-2013 and had an overall budget of € 5,321,546. The overall objective of the project was to increase the food security and incomes of the rural population working in the rice and vegetables sectors. More particularly, its objectives were:

- Revitalization and improved coordination of markets, with a better flow of information between actors, greater transparency and more stable and secure business links.
- Strengthening the competitiveness of production systems for all stakeholders and their ability to respond to market demands in terms of quality, quantity, efficiency, cost-effectiveness and sustainability for the environment.
- Establishment of an appropriate governance framework: the intervention was designed to strengthen the process launched by the Ministry of Agriculture, Livestock and Fisheries to develop a policy and regulatory instruments to promote activities in the agricultural sector and strengthen the capacities of the stakeholder groups in the sector (Zinha et al., 2013).

In addition, FAFA set up a project financing tool for private entrepreneurs (MIP) to finance activities of production, intermediate production processing and commercialization in both sectors - rice and vegetables. Together with the subsidy, the BTC provided entrepreneurs with managerial and technical training. The technical support provided for the implementation and operation of the investment allowed entrepreneurs to access a facilitation package for (i) procurement of equipment, (ii) materials, (iii) linking with traders for the marketing of their products and (iv) linking with financial institutions to obtain working capital in order to meet expenses over the production cycle.

The beneficiaries of the subsidies were selected with a four-stage selection procedure. At the first selection phase of the project 1125 MIP ideas were accepted in the period of July 2010 to June 2012. Then, 183 MIPs (16%) were selected for further screening and subjected to detailed examination of the application file. From these, 100 MIPs (8.9%) were approved by the validation committee ("Comité d'Étude et de Validation" - CEV). Eventually, 95 MIPs were funded, or 8.4% of the initial proposals. Half of the 95 projects were carried by individuals, predominantly men. The other half was carried by groups, which were also dominated by men. The majority of the subsidized projects was in production (79 projects), followed by the processing and marketing (12 projects) and input supply (4 projects). 56 projects were active in the vegetable sector and 29 in the rice sector, with 10 entrepreneurs having an activity in both sectors (Zinha et al., 2013).

11 The project was implemented in the regions of Mono-Couffo (FAFA MC) (2008-2013) and Atacora-Donga (FAFA AD) (2010-2015). The section is heavily based on Zinha et al. (2013).

12 Document available at: http://www.inter-reseaux.org/IMG/pdf/PSRSA_version_finale.pdf

For the commune/municipality pillar of the FAFA project, 46 projects were submitted by the 12 communes of Mono-Couffo[13] of which 27 (59%) were approved and funded. In total 65 working facilities were set-up with FAFA funds for municipal investment. One observation with respect to investments by municipalities is the preference of municipalities for investments which are easy to manage and quickly generate revenue, such as building of merchant facilities (shops). However, this type of investments is questionable with respect to the volumes of marketed products and the return on investment compared with communal investments that have a larger scale effect such as rural roads and irrigation schemes. The financing for public investments is conducted in the context of the communal development plans under the control of the communes and in accordance with the process of decentralization, with the objective to enhance entrepreneurial activity in the vegetables and rice sectors. It can also be delegated to municipalities by the communes for public interest reasons (e.g., warehouses) (Houenou et al., 2013).

3.1.2 The Project FAIA (La Facilité d'Appui aux Investissements Agricoles)

The FAIA project was implemented between 2010 and 2015. This project was a continuation of the FAFA project and had similar objectives:

- Improve capacities of stakeholder groups (local authorities, private operators, etc.) to integrate register their action in a concerted local economic development perspective and generate a collective effort to enhance the comparative advantages of agricultural production.
- Support municipalities for the construction of infrastructure and public amenities that contribute to improve the competitiveness of the agricultural subsectors. Based on the priorities defined by the actors, the project supports local communities in their role of project management for the development of useful public infrastructure, which is vital for the economic advancement of the agricultural subsectors.
- Support private initiatives which provide added value for the development of agricultural sectors. This support focuses on the information, training, development of business plans, market research and support of start-ups, etc.

13 The eligibility criteria for applying for the commune and municipal investment were (Houenou et al. 2013):
- Be a commune of Mono-Couffo and make a request for funding from the FAFA MC.
- Target the rice and vegetable sectors.
- A clearly identified impact on a group of entrepreneurs operating in the sectors. Entirely individual projects are excluded.
- Proposed projects must be registered in the Plan for Commune Development (Plan de Développement Communal – PDC) and(or) in the Annual Plan for Investment (Plan Annuel d'Investissement – PAI) of candidate localities.
- Future users should be involved in the set-up of the communal projects.
- Financial contribution to the project by the municipality (at least 10%).

The selection criteria for the commune and municipal investment projects were:

- Maximum four projects per commune can be subject to financing.
- Projects must not already be targeted by other development projects.
- The organizational and management arrangements and the mode of mobilization of beneficiaries should be clearly defined in advance.
- Indicators of activity, results and impact, and the data collection system must be specified in the project.
- Projects must address the imbalances on gender-related distribution tasks, access and control of resources.
- It is mandatory for the municipal investments to be in conjunction with the other actions (if any) funded in the municipality/commune by the FAFA MC.
- The projects must target a bottleneck in the rice or the vegetable sectors, and boost economic and social development, etc.

Houenou et al. (2013).

- Establish institutional mechanisms for channelling public aid for development of the agricultural subsectors.

A key difference between the two projects was the additional instrument PEA (Projet d'Entrepreneuriat Agricole – see p. 20) introduced within FAIA. In the next section we focus on the selection process of the FAIA project more in detail, due to a lack of data on FAFA. In addition, in an accompanying paper, we focus on the determinants of performance outcomes of the enterprises in our sample in terms of productivity.

4 | Selection of beneficiaries for the FAIA Project

4.1 Data

The selection procedure includes four phases. The first phase covers all entrepreneurs that made an application, with information on their location, sector of operation, individual or group of enterprises, scores on every eligibility criteria and the decision on pre-selection. In phases II and III, we have data only on those applicants that were accepted after the first phase. The data includes the location of the entrepreneur, individual or group type of enterprise, notes from the field visit, the decision after Phase II and the decision after Phase III. The data for Phase IV provides reports from the aim of the project, some general remarks on its feasibility, required improvements and the points from every criteria as well as the final points, which determine the projects that will be given the subsidy. Finally, for the projects which were selected for the subsidy, we have data on the amount of the subsidy together with the amounts of each of the three transfers made to the project. Based on this data we will analyse the selection process of the beneficiaries of the FAIA subsidy.[14]

4.2 Selection Phases

The selection process for the beneficiaries of the project consisted of four phases as summarized in Figure 4 below. In the first phase (call for applications) two calls for MIP (micro-project) applications were launched and disseminated twice daily (morning and evening) using radio releases on seven radio stations in Mono-Couffo from 7 to 21 August 2013 for the first call and 28 July to 19 August 2014 for the second call. This radio broadcast was reinforced by posters in public places (town halls, district offices, offices of producer organizations, Municipal Services Offices for Agricultural Development, etc.). Applications were received at a MIP-desk run by the Belgian NGO Louvain Development Cooperation (LD) which BTC-Benin contracted for the management of technical aspects related to the MIPs applications. From those two calls, 1019 applications were registered.[15]

14 Due to substantial data limitations we are unfortunately not able to do the same analysis for the other BTC project – FAFA. For FAFA we have available data on the preselected MIPs after the application phase, three of the four validation committee decisions CEVs (IV phase) and the finally selected applications.

15 There are in total 1035 applications made during the two FAIA calls. There are 16 duplicate observations (names) in both calls which means that 16 entrepreneurs applied in both calls. We correspondingly examine the scores of those applications in both calls and keep their score from call 1, which is also the first application they made. There are 15 applications given a zero score in Call 2 but which were already accepted in Call 1. Only one application was rejected in Call 1 and was accepted in Call 2. For five of the duplicate applications the village MIP was different in the application made in Call 1 and the application made in Call 2.
The resulting number of the applications we analyze further is eventually 1035 – 16 = 1019.

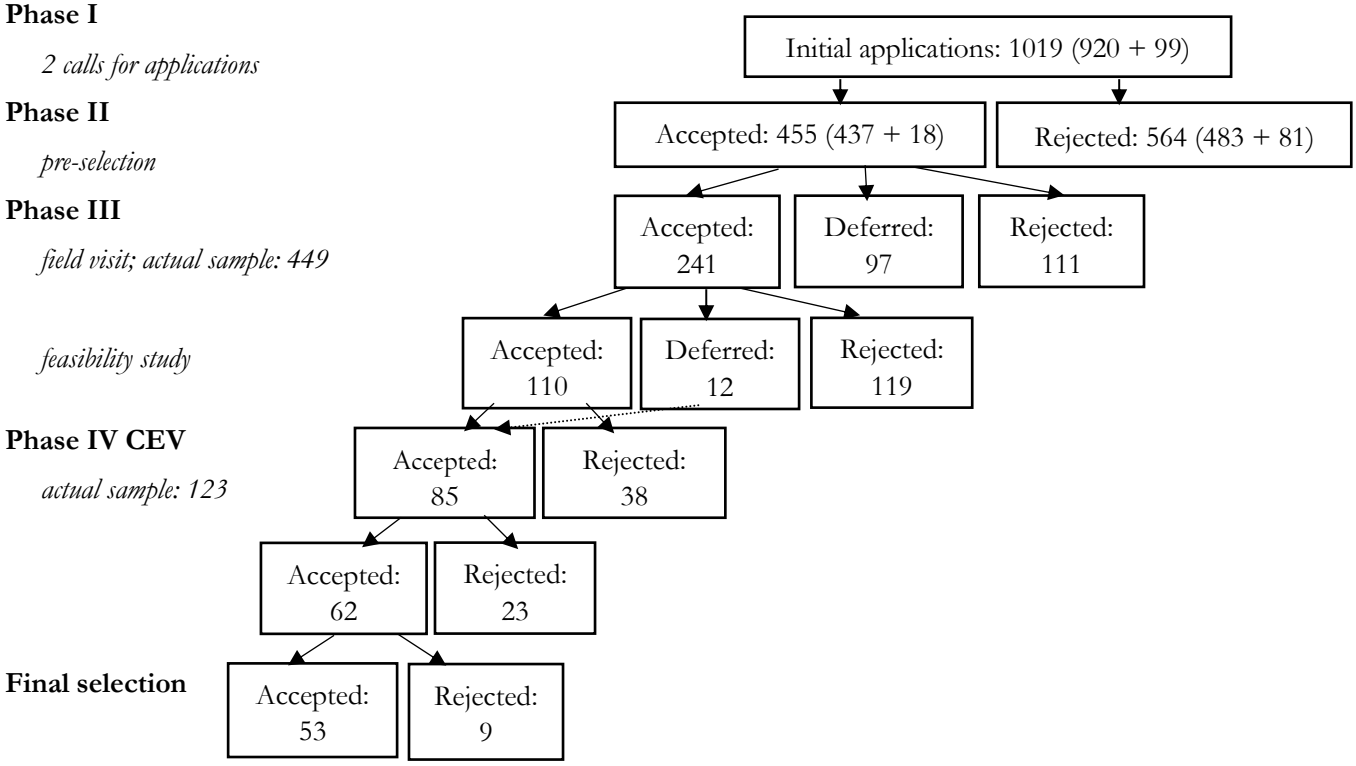


Figure 4: FAIA selection process

The number of applications varies across the communes, also after taking into account the population of the given commune. Within each commune there is also variability with respect to the sectors of operation of the entrepreneurs. Applications for projects in the vegetables sector dominate (about 73% of the total number of applications). The predominant entrepreneurial activity is production (around 70%) and the least represented one includes applications with projects in the transformation activity (around 2%). This low level of applications from entrepreneurs involved in the transformation stage is surprising given the important role they are supposed to play in the development of the supply chain. It thus raises a question for understanding the fundamental constraints facing these entrepreneurs.

The data also shows that the majority of applications are made by individual entrepreneurs (89%), with the remainder being made by groups of entrepreneurs. Finally, we look into gender difference among applicants. In the initial data provided by BTC-Benin the names of the applicants were provided, which enabled the identification of male vs. female of almost all applicants. For applications made by groups, information on the gender of the head of the group was requested by our team. Applications by female entrepreneurs are a minority (about 14%), although they are better represented as head of groups working in the rice and vegetable sectors (about 20%). The only difference between the male and female entrepreneurs is in the organizational type of the enterprise – males are more individual entrepreneurs and females are more group entrepreneurs.

After the applications have been submitted in the first phase they are subjected, at the second phase, to a scoring based on seven criteria (the pre-defined scores of each criteria are reported in brackets)[16]:

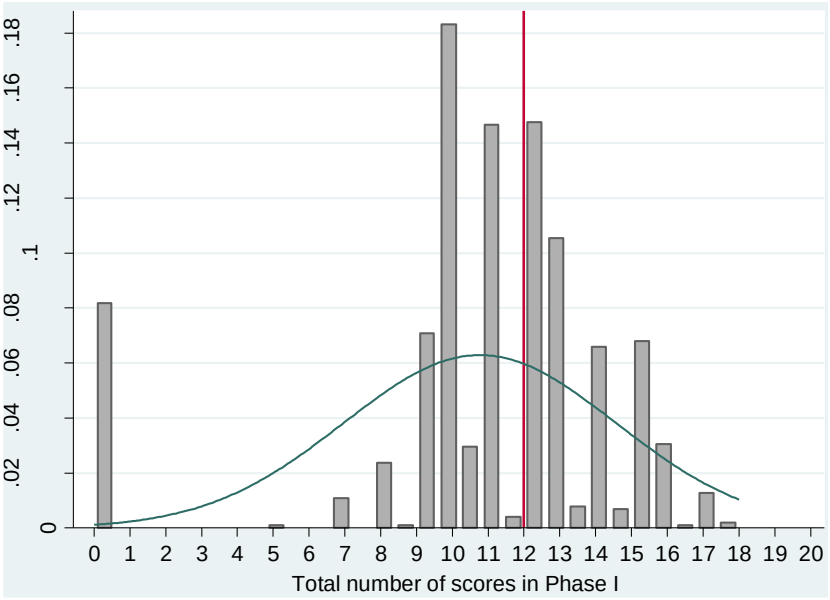
- Relevance of the sector of operation – only rice, vegetables or a combination of both is accepted
- Accuracy of provided contact information (0 or 2)
- Experience of the entrepreneur in the activity targeted by the project (1 or 3)
- Quality of the proposed project (1 to 5)
- Network integration within the supply chain of the targeted crops and experience of applicants with support projects in the past (1 to 5)
- Effort to obtain credit or subsidies (1 or 3)
- Capacity to obtain and manage efficiently credit and subsidies in the past (1 or 2)

Given the weight granted to certain criteria, BTC prioritises *quality of the project* and *network integration*. However, the network integration variable captures several concepts ranging from being a beneficiary of donor support in the past to its degree of integration in the supply chain. At this stage we do not know which of these concepts dominated the score assigned to the network criteria. It could be that the selection process is continuously targeting those that benefited from past donor programs, which would make it difficult to disentangle the impact of the current intervention from those in the past on the selected beneficiaries.

16 The original formulation in French of the eligibility criteria by BTC Benin was the following: i) L'activité du promoteur est-elle en rapport avec l'une des chaînes de valeurs - riz ou maraîchage? Préciser/maillon. (Oui = recevable, Non = rejet), ii) Les données fournies par le promoteur permettent de l'identifier et de le localiser sans difficulté? (Non = 0 Oui = 2), iii) Le promoteur a-t-il de l'expérience dans l'activité? (Ancienneté < 3 ans = 1 Ancienneté ≥ 3 ans = 3), iv) La justification du MIP est-elle pertinente? (entre 1 et 5), v) Quelle est le degré d'intégration du promoteur dans la filière (autres promoteurs ou PTF)? (Intégration à prendre en compte: Appui Technique, Appui Financier; Débouchés produits, Fournisseurs, Relation OP) (entre 1 et 5), vi) Le promoteur a-t-il mené des démarches pour l'obtention de crédits ou subvention? (Non = 1 Oui = 3) and vii) Le promoteur a-t-il obtenu et bien géré des crédits ou subvention? (Non = 1 Oui = 2).

Based on the aggregate score given to each application, proposals are either rejected or accepted using a cut-off score of 12 points. Figure 5 reports the distribution of the aggregate scores across the 1019 applications.

Figure 5: Distribution of application scores in selection Phase I



Source: BTC Benin.

As it can be observed in Figure 5, the distribution of the total scores is clearly skewed to the right. One interpretation of this finding is that entrepreneurs that are likely to display low scores were already screened out during the first stage when applications were submitted. We were informed about this practice but unfortunately we do not have quantitative records on their magnitude. Another possible explanation is that, given the eligibility criteria that were communicated during the call, low-score type entrepreneurs may have excluded themselves from the BTC project.

Finally, Figure 5 shows a mass of applications with scores just below the cut-off point of 12 (scores from 10 to 11), about 39% of the applicants. We therefore tried to examine the difference in the mean values of the observable characteristics of those applications that are in the score range 10-11 (just below the cut-off score for being accepted) and those that are accepted.[17] We find three main differences: *network integration*, the *effort to obtain credit or subsidies*, and the *capacity to obtain and manage efficiently credit and subsidy in the past*.[18] Thus, the quality of those 39% rejected projects is not fundamentally different from the quality of those that are being selected at this stage - we did even find projects of better quality within this group as compared to those which are being selected.

4.3 Data Analysis

To have a more in-depth analysis of the selection process of FAIA, we estimate with the help of a probability model (probit) the determinants of the probability for applications to be selected based on the scores on the eligibility criteria. For this purpose we concentrate on the last five criteria as the first two criteria are redundant to the selection procedure. In addition, we control for gender (female

17 If we perform the test of equality of means for the available characteristics at the first phase by sector of entrepreneurial activity (vegetables vs. rice), the difference in observable characteristics are in the organizational type of the enterprise – individual and group, which explains also the result that we see a difference in the variable on network integration between those two sectors. This can be interpreted as a sector specific characteristic; in the vegetables sector the dominant type of entrepreneurial organization is individual and in the rice sector it is the group.

18 The communes Aplahoué and Dogbo had more applications just below the cut-off score compared to the rest of the communes in Mono-Couffo.

versus male) of the entrepreneur, individual (versus group) entrepreneur and type of crop. We would have also liked to include information indicated on the application sheet but data limitation did not allow. The first column in Table 2 reports the estimation results.

On aggregate we find a significant and positive effect of all five eligibility criteria considered: experience of the entrepreneur, quality of the project, past credit and subsidy management, effort for taking a credit as well as network integration. This result suggests that, overall, those involved in the selection process have successfully applied the eligibility criteria. However, our estimated selection function assigns a relatively limited role to the criteria related to the quality of project as initially defined by the score of this criterion. In particular, the highest weight is found for network integration (0.469), then experience (0.447), effort to obtain credit and subsidies (0.337), quality of the project (0.297), and finally capacity to obtain and manage credit and subsidies (0.259).

Based on these estimated weights assigned to each criterion and the total score that each application receives from all the criteria we estimate the predicted probabilities on being selected in the second phase. Note that according to this procedure an application will be accepted if the predicted probability is at least equal to 0.5, otherwise it will be rejected. This procedure points to some interesting results. For instance, we find that 21% of the applications with 10 to 11 total score that were rejected by the evaluation committee should have been selected to the next phase. These can be taken as indication for the potential of some of the rejected applications with a total score just below the cut-off to go further in the selection process. In the same way, we find that 7% of the applications selected with the score of 12 should have been rejected – their predicted probability is lower than 0.5.

In the third phase a field visit to the plot and a feasibility study on the proposed project was conducted by BTC-Benin. The field visit aimed to verify the technical and economic feasibility of the project and obtain information on the technical capabilities of the applicant and his/her financial morality. The criterion on financial morality has been verified by confronting the applicant with questions related to previous loans or financial support he/she received. During the field visit, a report detailing the status of each applicant, the feasibility analysis of the project and the subsequent decision was made. The decision of 'acceptance', 'rejection' or 'deferral' has been made on the basis of the following criteria: (i) technical and management capacity of the applicant, (ii) co-financing of the entrepreneurial activity, (iii) characteristics of the production terrain (topography, flood risk, the availability and quality of water, etc.) and (iv) financial morality.

After the field visit, the Regional Functional Unit (Unité Fonctionnelle Régionale - UFR) conducted an assessment (feasibility study) on those proposals accepted after the field visit based on the following criteria: (i) the current operational capacity of the entrepreneur: a producer will be selected when he/she operates on at least 0.5 ha. of land for the vegetables sector or 1 ha. for the rice sector, (ii) the ambition of the entrepreneur: the cropped area planned to be developed should not exceed twice the area which is currently operated and reported by the applicant and (iii) an adequacy between the proposed investment and its profitability potential. After the feasibility study the applications were 'accepted', 'rejected' or 'deferred'. The 'deferred' applications were eventually rejected due to the budget constraint of the FAIA project and only those applications that have been accepted continued to the next selection phase. The detailed project plans were subject to a final quality assurance by the UFR. The quality assurance part in this selection phase was intended to possibly correct and improve the detailed project before it is submitted to CEV of the MIP which is also the fourth (and last) selection phase.

Table 2: Probit model on the selection of the subsidy beneficiaries by phase - marginal effects

	(1) Phase II	(2) Phase III.I	(3) Phase III.I	(4) Phase III.I	(5) Phase III.II	(6) Phase III.II	(7) Phase III.II	(8) Phase IV.I	(9) Phase IV.II	(10) Phase IV.III
Experience (= 1)	0.447***	-0.317***			0.300*					
	(0.0580)	(0.118)			(0.166)					
Quality of the project (= 1)	0.297***	-0.136*			0.0587			-0.132*		
	(0.0250)	(0.0740)			(0.0641)			(0.0792)		
Credit and subs. man (= 1)	0.259***	0.0899			0.0372			0.00161		
	(0.0483)	(0.0772)			(0.0781)			(0.100)		
Effort to obtain a credit or subsidy (= 1)	0.337***	0.0621			0.0908			0.173**		
	(0.0229)	(0.0475)			(0.0844)			(0.0680)		
Network integration (= 1)	0.469***	0.0292			0.120***			0.125		
	(0.0368)	(0.0673)			(0.0446)			(0.0881)		
Female (= 1)	0.00987	0.0380			0.117			-0.0507		
	(0.0220)	(0.0668)			(0.0716)			(0.108)		
Vegetables (= 1)	-0.00708	0.0118			-0.0398			0.188**		
	(0.0201)	(0.0830)			(0.114)			(0.0941)		
Individual (= 1)	-0.00179	0.171*			0.0403					
	(0.0231)	(0.0901)			(0.0864)					
Total score Phase I			0.00438			0.0505***			0.0533**	
			(0.0223)			(0.0184)			(0.0234)	
Pr(accepted) Phase I				0.0192			0.452***			0.429*
				(0.139)			(0.165)			(0.247)
Applications	903	412	412	412	235	235	235	77	77	77

Notes: Clustered standard errors in parentheses; cluster variable – commune of the MIP. The variables 'network integration' and 'quality of the project' have been normalized to 0 and 1, with the cut-off being category 3; i.e., network integration = 1 and 2 is aggregated to 0 and network integration = 3, 4 and 5 is aggregated to 1[19]. Phases II, III and IV refer to the selection process as explained in Figure 4. *** significance at 1 %, ** significance at 5 %, * significance at 10 %. The dependent variable in every specification is 'being accepted', which equals 1 if the applications has reached at least the cut-off score for acceptance in the next phase and 0 if it has been rejected. Source: BTC Benin.

19 We also ran the probit regressions for the field visit and the feasibility study by taking the lowest category (1) as a reference category for the purpose of comparison with the rest of the categories. For the field visit the quality of the project is not significant and the experience of the entrepreneur remains significant; for the feasibility study the experience is no longer significant and the network integration remains significant. In contrast, when we take as a reference group the categories 1 and 2, for the field visit the quality of the project becomes significant and the experience of the entrepreneur remains significant. For the feasibility study experience becomes significant, the network integration remains significant and the female variable becomes significant.

The CEV committee undertook a final proof on the project proposal, gave recommendations on its improvement and assessed the entrepreneurial competence of the applicant. Figure 4 reports the different decisions that can be summarized as follows: field visit – accepted (241), deferred (97), rejected (111) and feasibility study – accepted (110), deferred (12), rejected (119). Moreover, columns (2) and (5) of Table 2 indicate the selection functions for phase 3 based on the eligibility criteria assigned in phase 2.

First, Figure 4 shows that the third selection phase further reduced the number of applicants from 455 to 110 (after the field visit and the subsequent feasibility study).[20] Second, the results reported in column (2) and (5) of Table 2 suggest that during the field visit experience and quality of the application are significant variables which seem in this phase to favour those with lower reported experience and lower quality of the project in the first phase. On one side, this could be explained by the characteristics of the terrain and the technical capacity of the applicant to execute the proposed activity which are given a higher weight at this moment. On the other side, since the main goal of the field visit is to verify a number of stated capabilities of the applicant and characteristics of the proposed terrain there might be a problem of information asymmetry in the first phase. Those hypotheses are also consistent with the results we report in columns (3) and (4) of Table 2 which do not point to a significant effect of the scores obtained by the applicant in the first phase (which are an aggregate measure for the joint importance of the eligibility criteria) or the predicted probability to be pre-selected in the second selection phase.

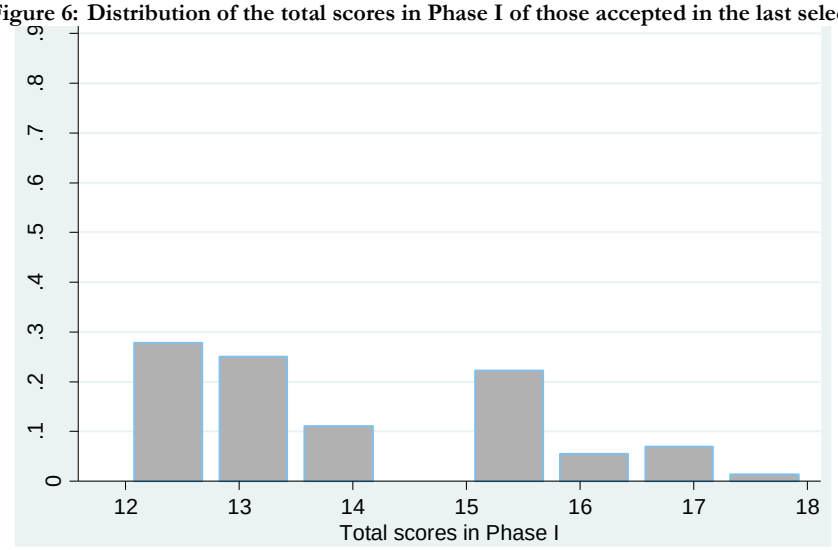
The results from the feasibility study contrast with those from the field visit. In the third phase of the selection, the experience and the network integration of the entrepreneur are very important determinants to be selected for the next phase. This is consistent with the objectives formulated for this part of the selection process. In addition, the total scores obtained by the entrepreneur in the first phase as well as the predicted probabilities for acceptance in the second phase are significant. Those results indicate also a sign of persistent importance of the experience of the entrepreneur as an eligibility criteria determining the progress through the selection process and the selection for receiving the subsidy.

We conducted a similar analysis for the fourth phase of the selection process where the CEV makes the final decision. The results in columns (8)-(10) of Table 2 indicate that the overall performance in Phase I is a good predictor for selection in Phase IV. In particular, the variables related to experience[21] and effort to obtain credit or subsidies play a positive and significant role. On the contrary, the applicants that reported better quality on the project have been penalized. An interesting finding for those applications selected at the last phase is that there were applications with a score of 12 (just at the cut-off) as well as applications with scores of 15 and above in the first selection phase (see Figure 6 below). The initial score might therefore not be completely informative about the probability of success of a particular application to be eventually selected in the last phase. On the contrary, our quantitative analysis by phase (Table 2) identifies three eligibility criteria as particularly important in the selection process – *network integration*, *experience*; and *effort to obtain credit or subsidies*.

20 Based on the data we have obtained by the BTC-Benin we have information for a decision at the field visit for 439 applications (111 'rejected', 97 'deferred' and 231 'accepted') and 226 applications at the feasibility study (118 'rejected', 10 'deferred' and 98 'accepted').

21 All applicants that reached the final phase of the selection process satisfy the experience criterion, which, due to the lack of variation of this variable, led to its omitting from the regression model.

Figure 6: Distribution of the total scores in Phase I of those accepted in the last selection phase



Source: BTC-Benin.

Finally, our analysis looks at the gender aspect and the type of crop. We find that the type of crop variable is statistically significant. In particular, projects in the vegetable sector, as compared to the rice sector, are more likely to be selected in the last phase. On the contrary, the female variable is not significant when we continue further in the selection process, neither is the interaction between it and other variables such as credit and subsidy management. We are, however, cautious to interpret this as rigorous evidence that gender does not matter for the selection process as the sample of female applications is considerably smaller than this of male applications.

5 | Conclusion

We have attempted to investigate two projects of the Belgian Technical Cooperation in the department of Mono-Couffo, which aim to boost entrepreneurship in the vegetables and rice sectors, based on the recognition that access to credit, in particular for financing fixed assets, is a considerable barrier for enterprises' growth in those two agricultural sub-sectors. Due to the incomplete data and various biases related to the design of the projects we were, unfortunately, not able to develop a full-fledged analysis, as it was not possible to make a proper and reliable assessment of the impact of BTC's support on the performance of the beneficiaries. In this paper, instead, our focus is therefore on understanding the context of the intervention, the selection process of the beneficiaries of the subsidy and the most important characteristics for successful selection.

The selection process of beneficiaries includes four phases. Analysis of data from the different phases points to several interesting observations. First, there is domination in the application from male individual producers in the vegetable sector compared to entrepreneurs in the production processing or commercialization, the rice sector, group of entrepreneurs and female entrepreneurs. In particular, a concern may be that producers are considerably more represented than other parts of the value chain targeted by BTC – input suppliers, intermediate production processing and commercialization. Secondly, the selection process, based on the eligibility criteria defined by the BTC team, is biased towards applicants with better scores on the criteria related to network integration and quality of the project. It has to be noted that the selection criteria and their scoring

were sometimes missing precise interpretation, which, in fact, may have led to a selection bias of certain beneficiaries. When comparing the scores of phase I with the final selection at phase IV, we find that there are applications with a total score of 12 in Phase I (which was the cut-off for pre-selection in Phase II) which were finally selected as well as applications with a score of 16 in the initial phase. One would instead expect to find at the final selection phase those applicants that scored the highest according to the initial eligibility criteria in Phase I. Our explanation for this puzzle is related to the definition of the criteria and the information provided by the enterprises. In fact, what one observed in the selection process is applications dropping out not only because they are below the cut-off score, but also because there is indeed misreporting, problems to cooperate with the co-financing party, and budget constraint of the BTC project to finance all successful applications. A successfully intervention should address these structural problems. This, however, requires a depth understanding of their root causes. Moreover, the selection process could be shortened considerably as to gain efficiency and a randomization process could be integrated as to allow clear impact evaluation.

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Annexes

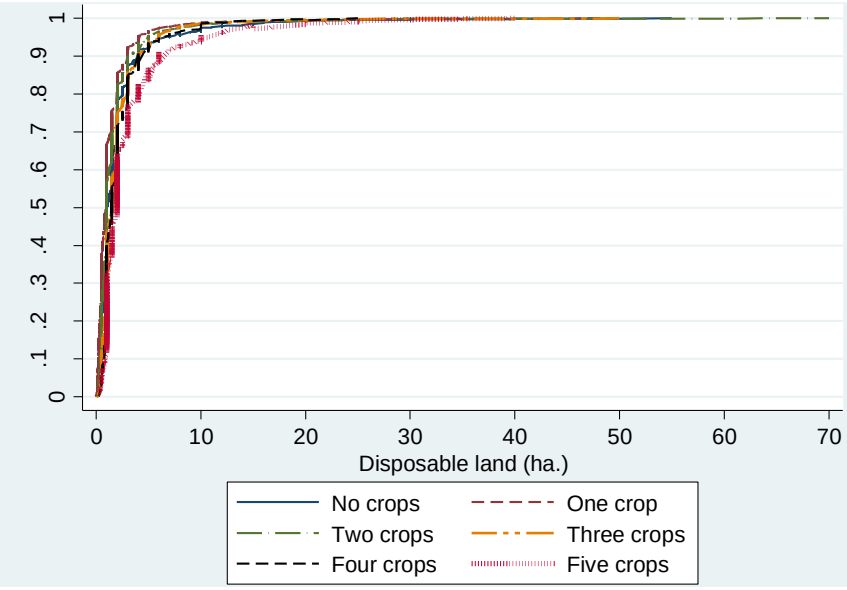
Annex 1[22]

Table 3A: Distribution of disposable, cropped and total land by commune

Commune	Disposable land (ha.) (agric. census)	Cropped land (ha.) (agric. census)	Total area (ha.) (pop. census)	dispos. land/tot. land	cropped land/tot. land
Aplahoué	4,377.81	607.39	91,500	4.78	0.66
Athiémé	1,438.13	356.17	23,800	6.04	1.50
Bopa	2,517.66	466.71	36,500	6.89	1.28
Comè	1,093.31	176.76	16,300	6.70	1.08
Djakotomè	797.42	384.81	23,500	3.39	1.64
Dogbo	2,582.17	941.29	30,800	8.38	3.06
Grand Popo	1,799.24	965.67	28,900	6.23	3.34
Houeyogbe	1,407.31	239.97	29,000	4.85	0.83
Klouekanmé	1,540.68	335.02	39,400	3.91	0.85
Lalo	4,152.38	828.87	43,200	9.61	1.92
Lokossa	1,012	405.59	26,000	3.89	1.56
Toviklin	376.23	116.4	12,000	3.13	0.97
Total	23,094.34	5,824.65	400,900	5.76	1.45

Source: BTC Benin; INSAE Benin.

Figure 7A: CDF of total disposable land by number of vegetable crops produced by a producer in the census



Note: The total disposable land is the aggregate land by producer and commune, when the producer produces no crops, one crops, two crops, etc. Only the agricultural season I is covered.

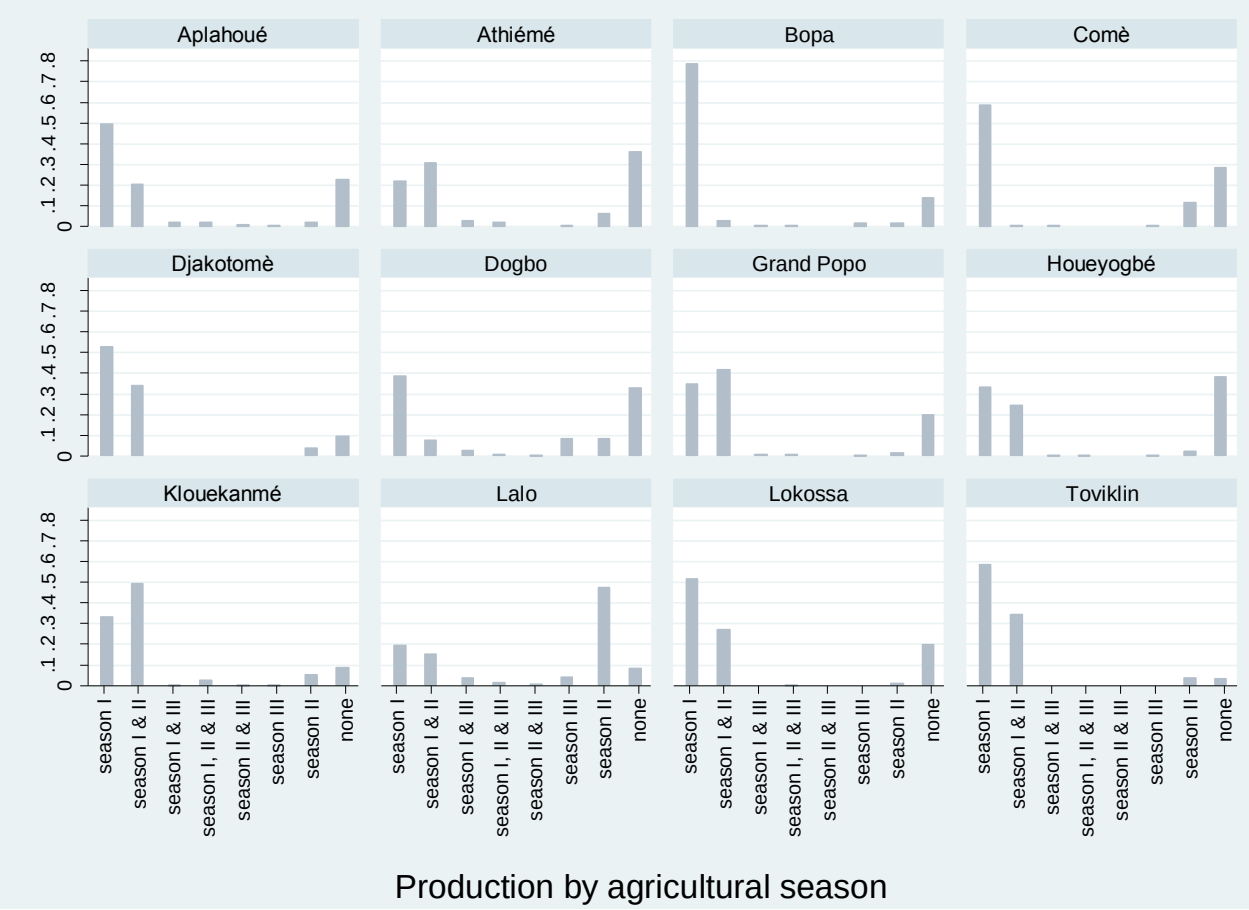
22 Appendix for Section 2.1.

Source: BTC Benin.

Figure 8A: Type of producers - vegetables, rice, none and both

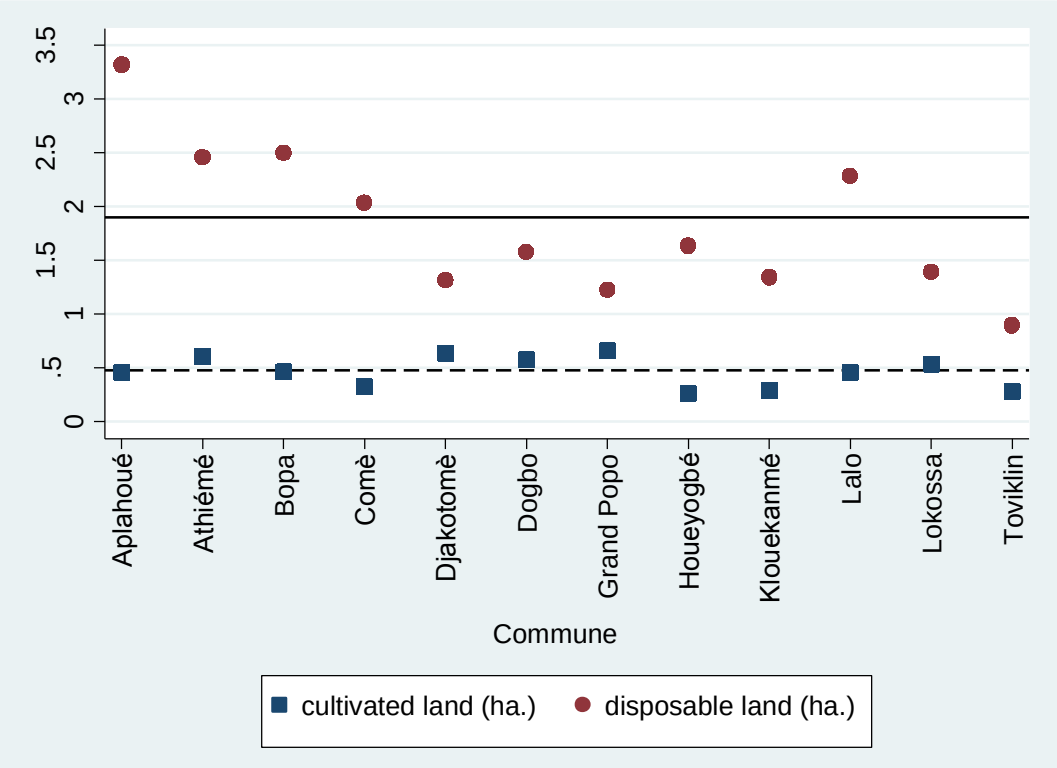
Source: BTC Benin.

Figure 9A: Production by agricultural season and commune (rice and vegetables)



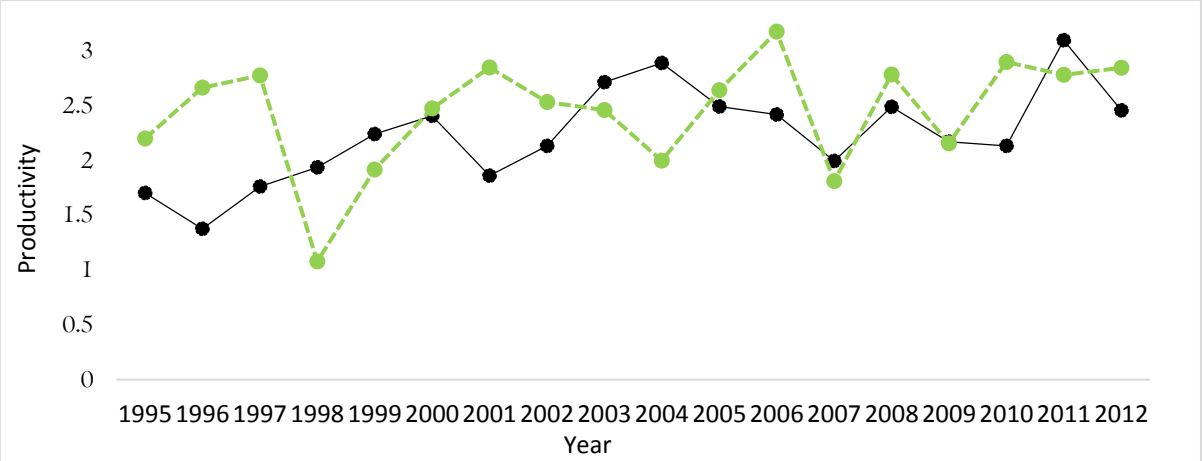
Source: BTC Benin.

Figure 10A: Cropped and disposable land by commune



Note: The straight horizontal line is represents the mean disposable land (ha.) over all communes and the dashed horizontal line represents the mean cultivated land (ha.) over all communes.
Source: BTC Benin.

Figure 11A: Comparison in the median productivity (tons/ha.) in the production of rice in Benin and Mono-Couffo (1995-2012)



Notes: The green dashed line represents the median productivity for Mono-Couffo; the black line represents the median productivity for Benin excluding the departments of Mono-Couffo.
Source: CountrySTAT.

Figure 12A: Production of rice in Mono (1995-2012)

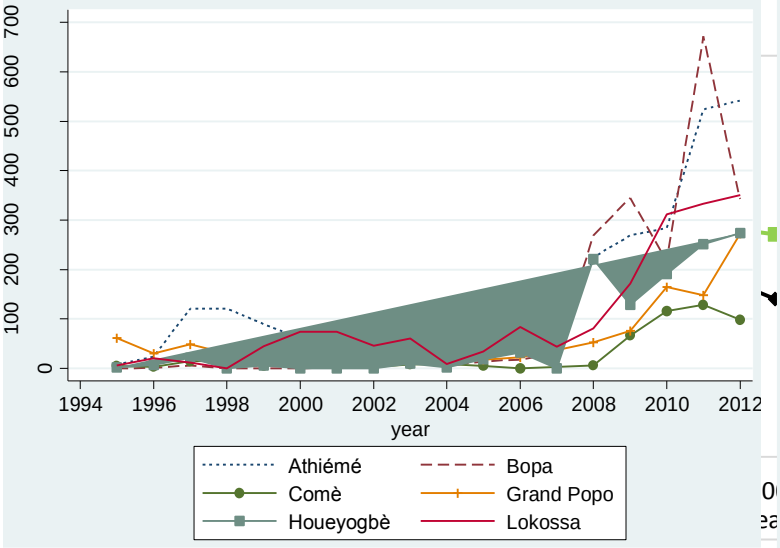
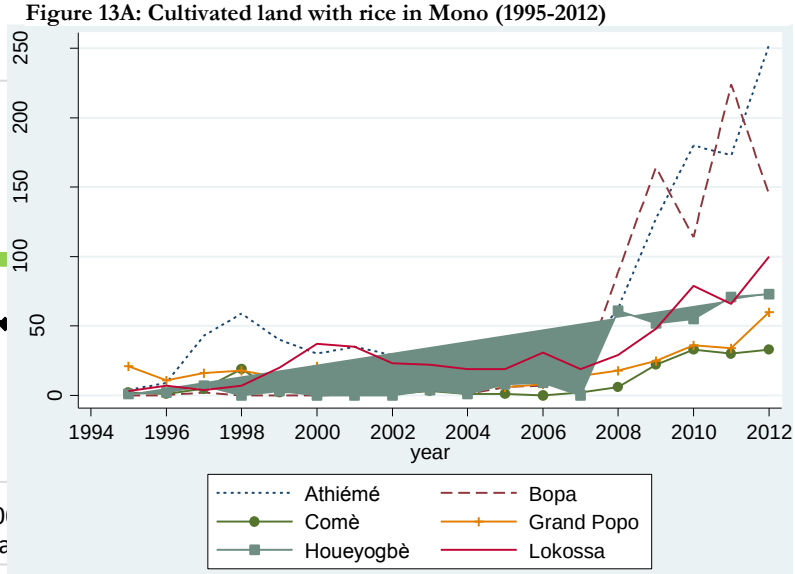


Figure 13A: Cultivated land with rice in Mono (1995-2012)



Notes: The lines represent the six communes of Mono.
Source: CountrySTAT.

Figure 14A: Production of rice in Couffo (1995-2012)

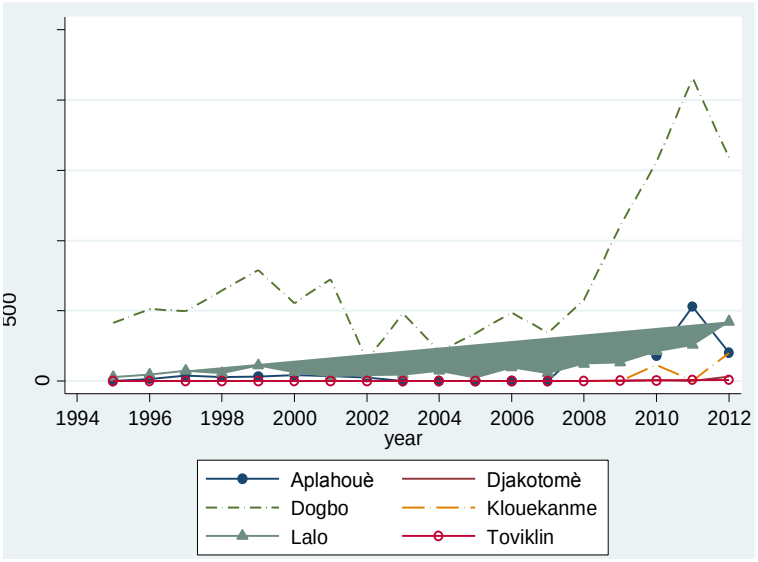
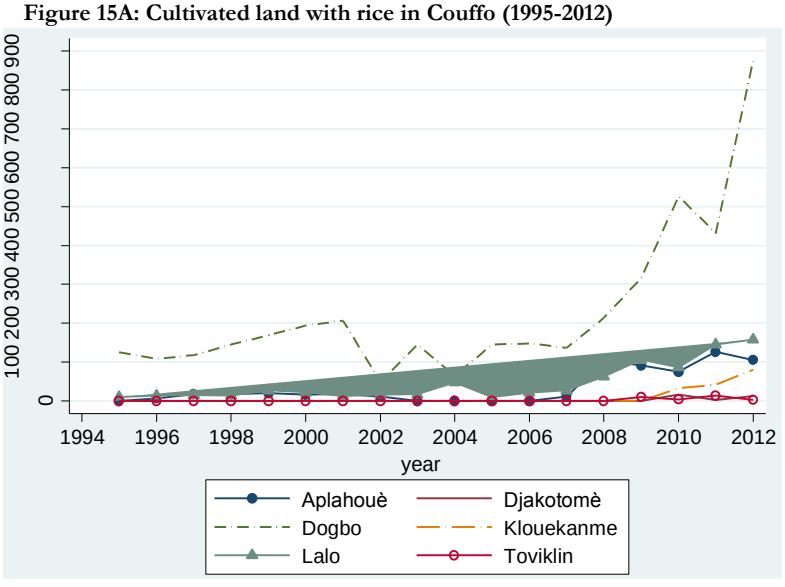


Figure 15A: Cultivated land with rice in Couffo (1995-2012)



Notes: The lines represent the six communes of Couffo.
Source: CountrySTAT.

Figure 16A: Comparison in the median productivity (tons/ha.) in the production of tomato in Benin and Mono-Couffo (1995-2012)

Notes: The green dashed line represents the median productivity for Mono-Couffo; the black line represents the median productivity for Benin excluding the departments of Mono-Couffo.
Source: CountrySTAT.

Figure 17A: Production of tomato in Mono (1995-2012)

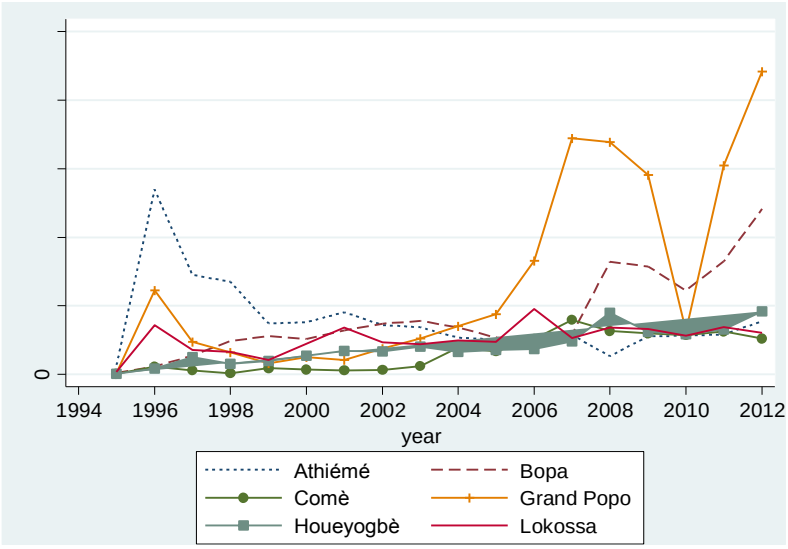
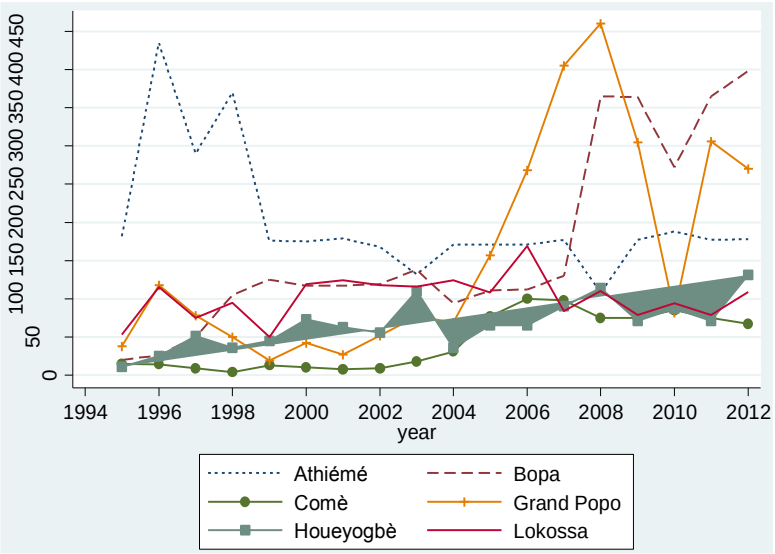


Figure 18A: Cultivated land with tomato in Mono (1995-2012)



Notes: The lines represent the six communes of Mono.
Source: CountrySTAT.

Figure 19A: Production of tomato in Couffo (1995-2012)

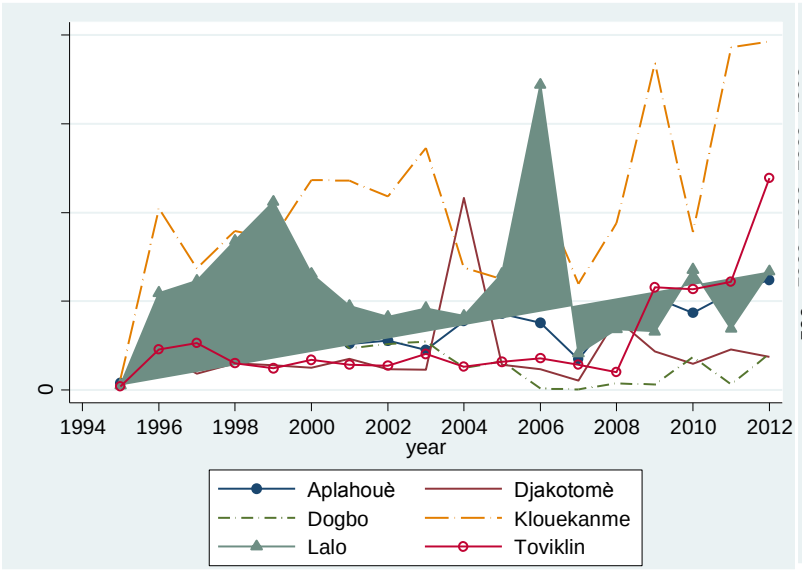
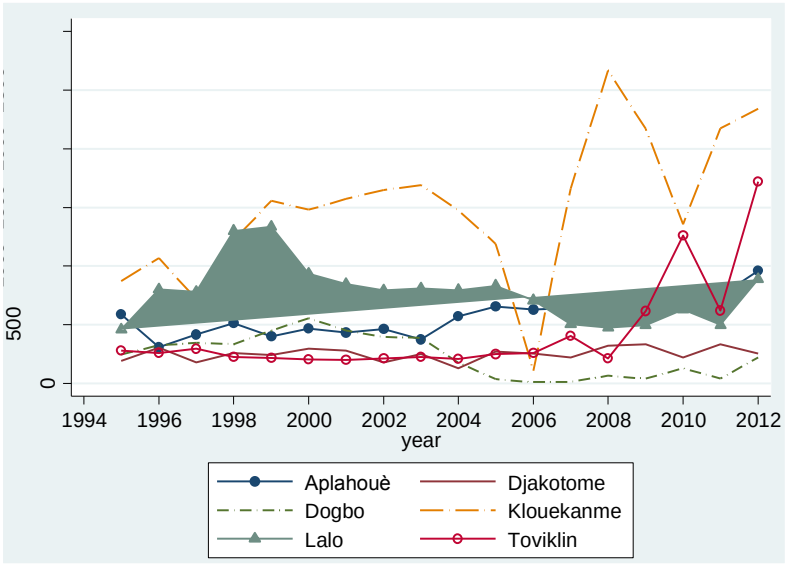
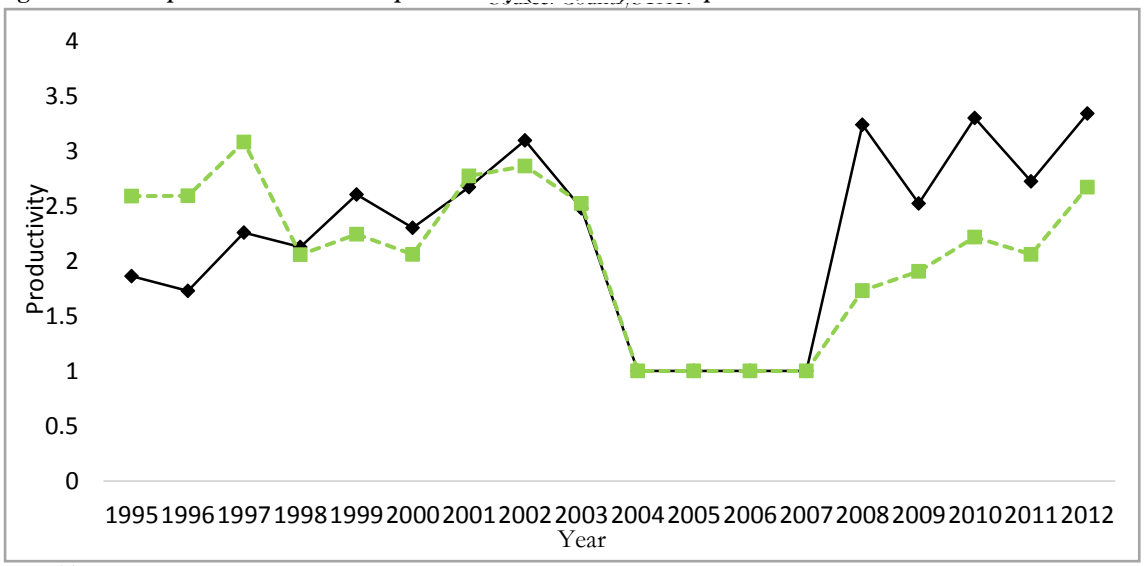


Figure 20A: Cultivated land with tomato in Couffo (1995-2012)



Notes: The lines represent the six communes of Couffo.
Source: CountrySTAT.

Figure 21A: Comparison in the median productivity (tons/ha.) in the production of okra in Benin and Mono-Couffo (1995-2012)



Notes: The green dashed line represents the median productivity for Mono-Couffo; the black line represents the median productivity for Benin excluding the departments of Mono-Couffo
Source: CountrySTAT.

Figure 22A: Production of okra in Mono (1995-2012)

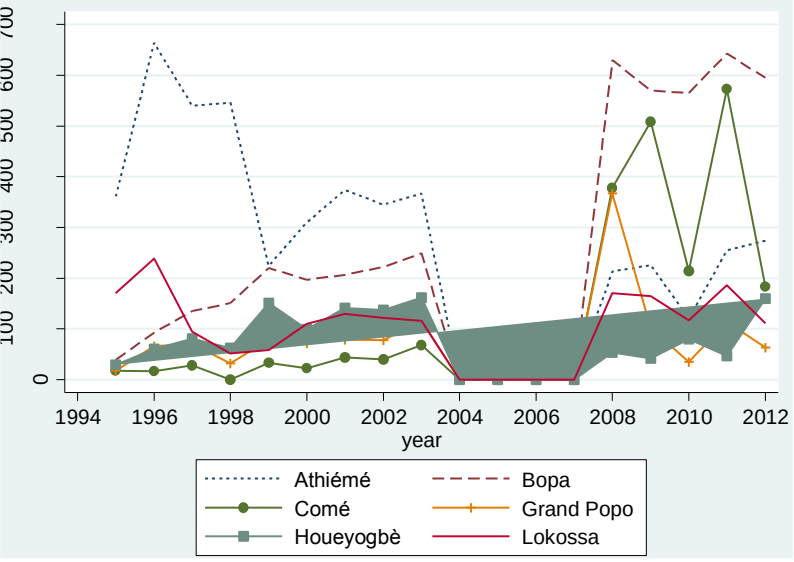
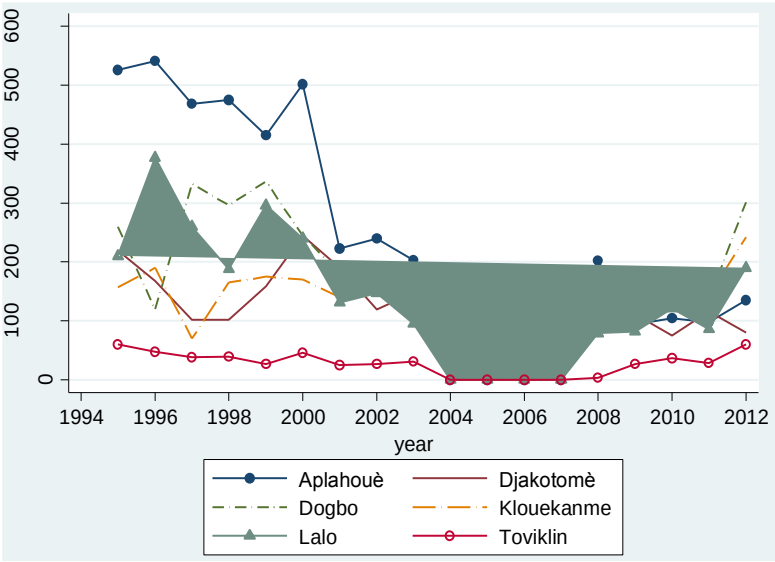


Figure 23A: Cultivated land with okra in Mono (1995-2012)



Notes: The lines represent the six communes of Mono.
Source: CountrySTAT.

Figure 24A: Production of okra in Couffo (1995-2012)

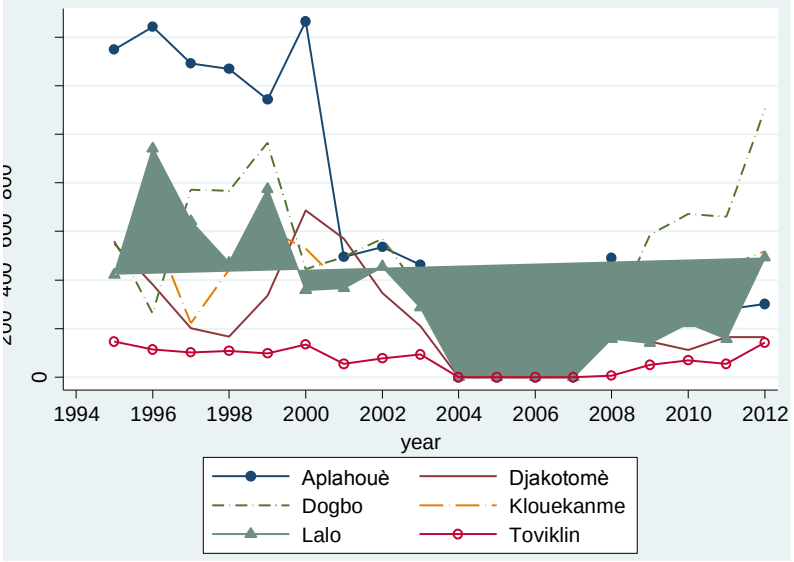
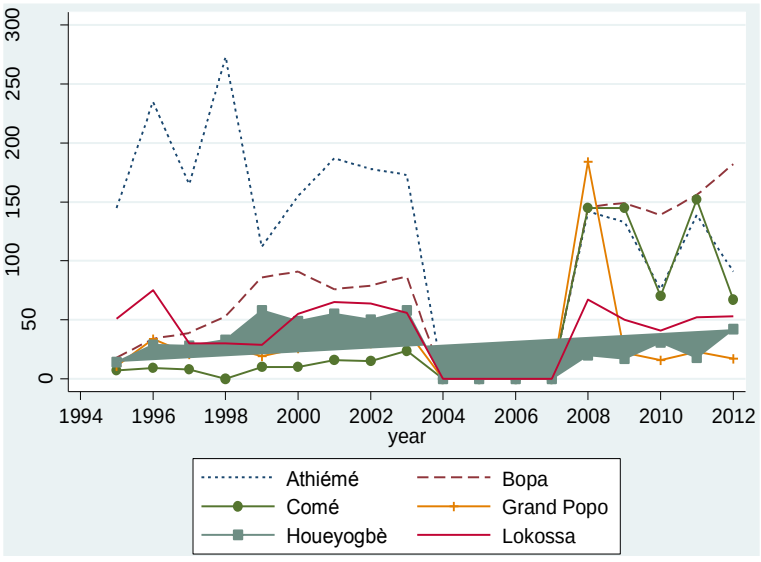
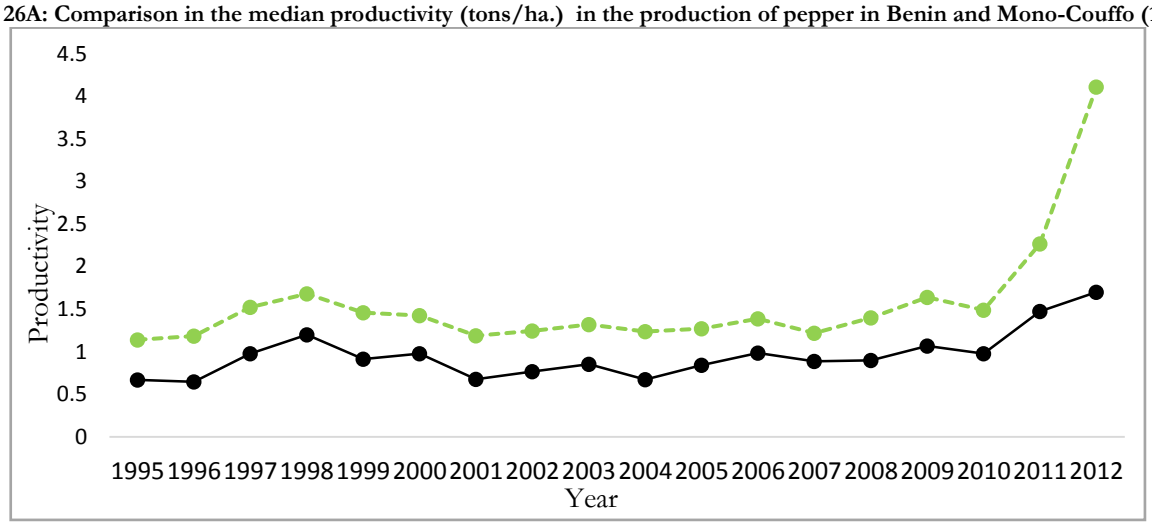


Figure 25A: Cultivated land with okra in Couffo (1995-2012)



Notes: The lines represent the six communes of Couffo.
Source: CountrySTAT.

Figure 26A: Comparison in the median productivity (tons/ha.) in the production of pepper in Benin and Mono-Couffo (1995-2012)



Notes: The green dashed line represents the median productivity for Mono-Couffo; the black line represents the median productivity for Benin excluding the departments of Mono-Couffo.
Source. CountrySTAT.

Figure 27A: Production of pepper in Mono (1995-2012)

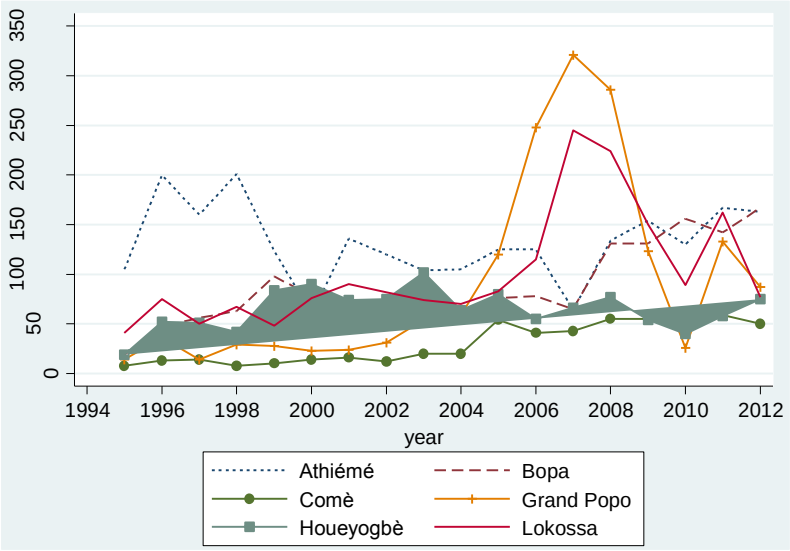
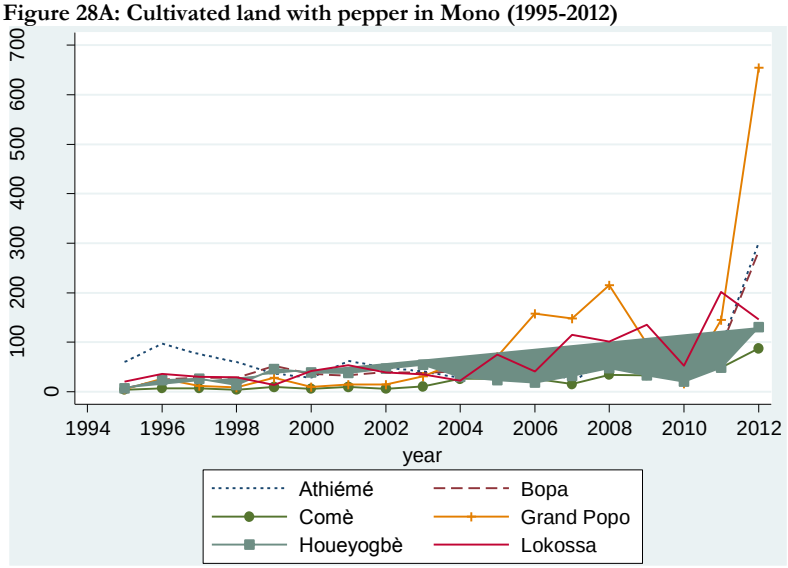


Figure 28A: Cultivated land with pepper in Mono (1995-2012)



Notes: The lines represent the six communes of Mono.
Source: CountrySTAT.

Figure 29A: Production of pepper in Couffo (1995-2012)

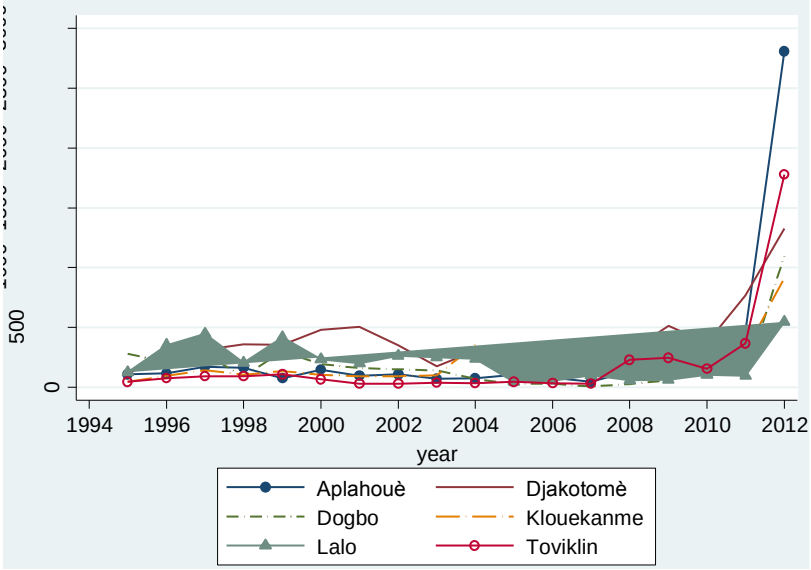
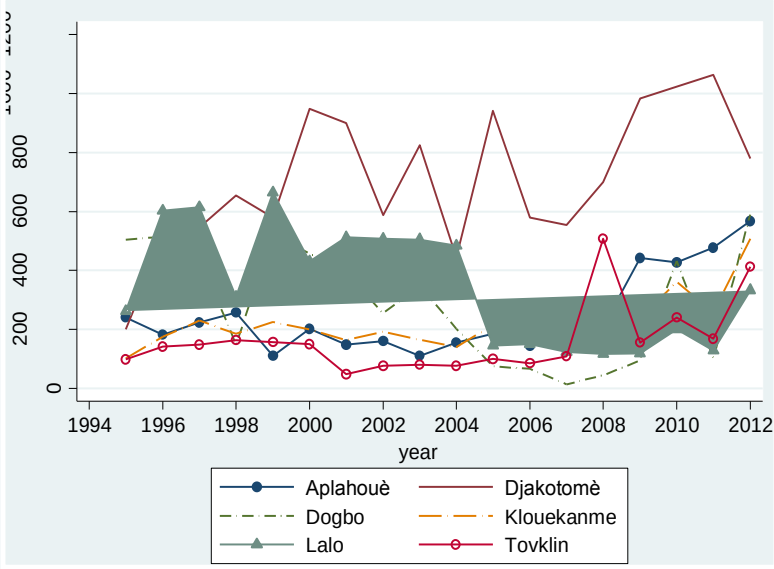


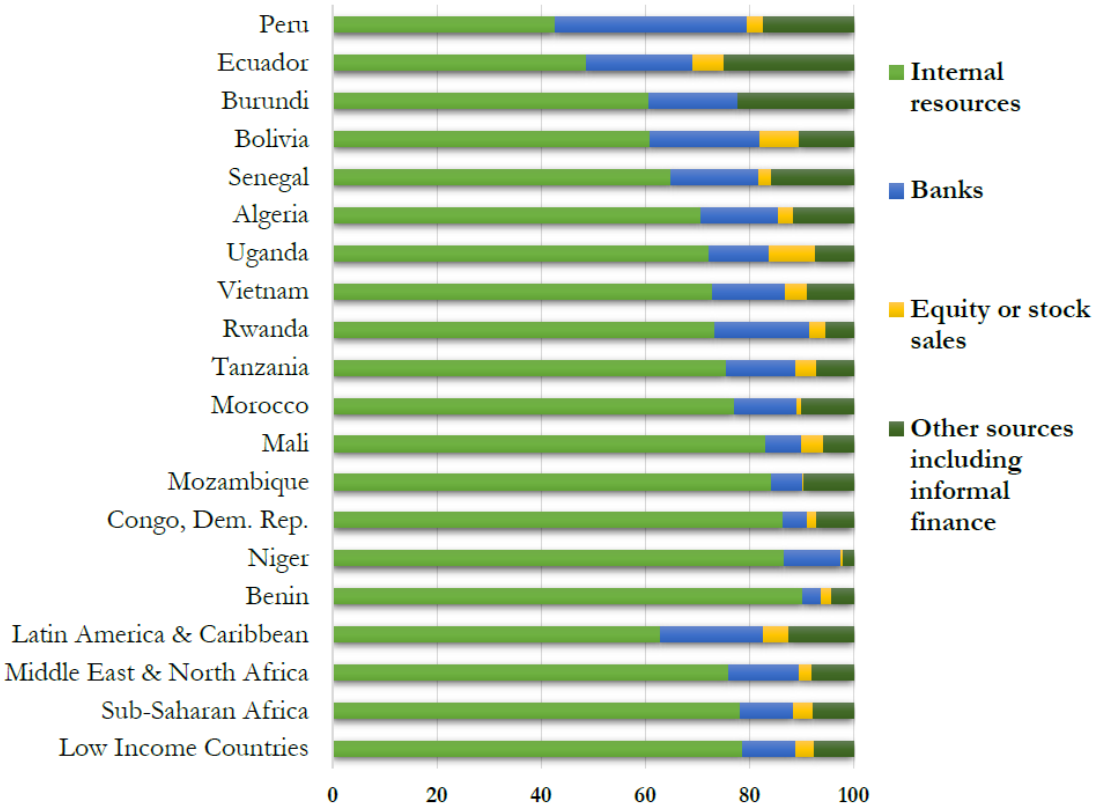
Figure 30A: Cultivated land with pepper in Couffo (1995-2012)



Notes: The lines represent the six communes of Couffo.
Source: CountrySTAT.

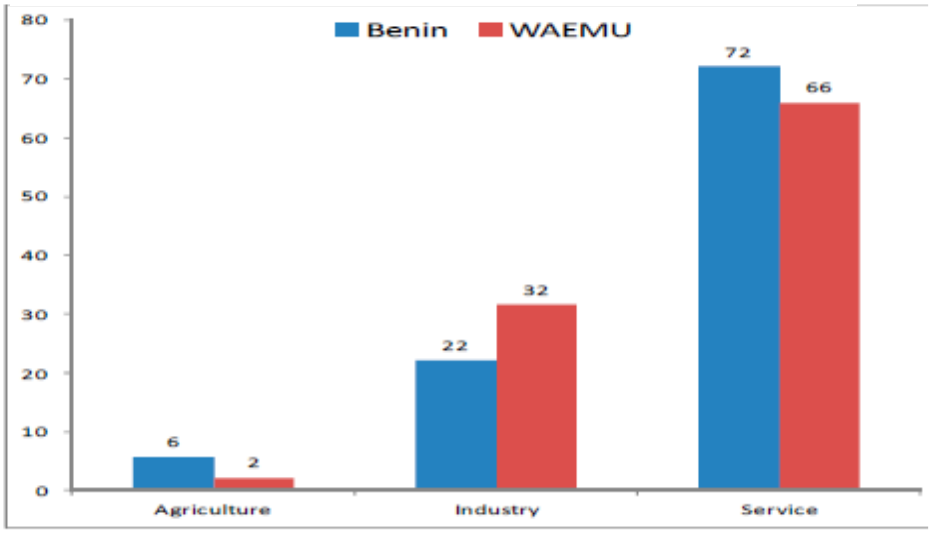
Annex 2[23]

Figure 31A: Firms sources of finance by country: the predominance of the use of internal financing.



Source: World Bank Enterprise Surveys 2006-2013. Figure adapted from Dayé, Houssa and Reding (2015), p. 18.

Figure 32A: Benin: Sectoral Distribution of Bank Loans (percent of total)



Source: Beninese authorities, BCEAO, and IMF staff calculations. Figure adapted from IMF (2016), p. 10.

[23] Appendix for Section 2.2.

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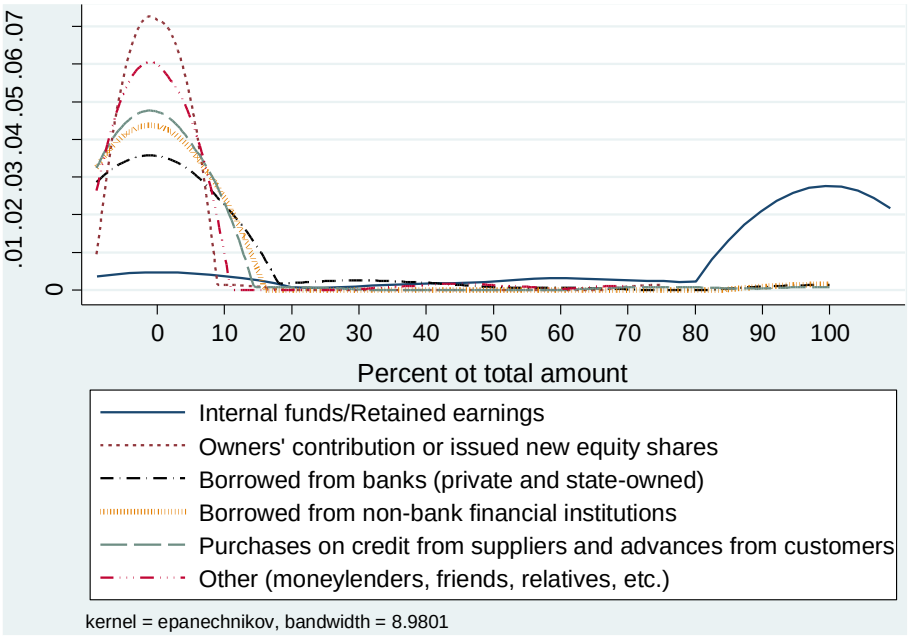
Table 4A: Most serious obstacle affecting the operation of this establishment

	Freq.	Percent	Cum.
Do not know	1	0.67	0.67
Access to finance	34	22.67	23.33
Access to land	3	2.00	25.33
Corruption	14	9.33	34.67
Courts	1	0.67	35.33
Crime, theft and disorder	3	2.00	37.33
Customs and trade regulations	5	3.33	40.67
Electricity	24	16.00	56.67
Inadequately educated workforce	2	1.33	58.00
Labor regulations	2	1.33	59.33
Political instability	7	4.67	64.00
Practices of competitors in the informal sector	19	12.67	76.67
Tax administration	19	12.67	89.33
Tax rates	11	7.33	96.67
Transport	5	3.33	100.00
Total	150	100.00	

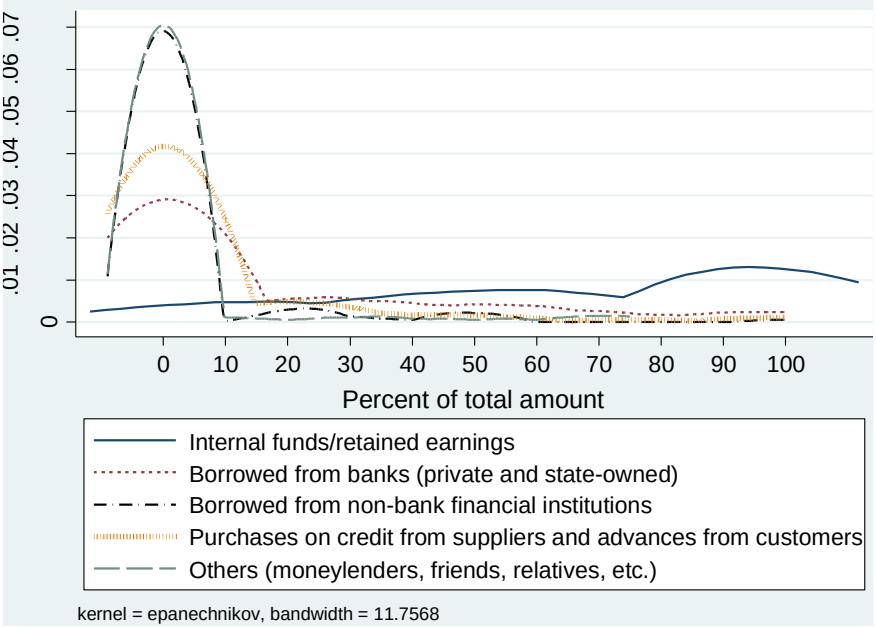
Note: Question asked in the Enterprise Survey: "You have identified that several obstacles affect the operation and growth of this establishment. Here is a card with the obstacles I just listed [HAND RESPONDENT CARD 16 LISTING ALL FACTORS]. Please tell me three that you think are currently the biggest problem, beginning with the worst of all three." The number of enterprises which answered this question is 150.
Source: World Bank Enterprise Survey – Benin (2009).

Figure 33A: Type of financing of working capital



Notes: Question asked in the Enterprise Survey: "Over fiscal year [2009], please estimate the proportion of this establishment's working capital that was financed from each of the following sources? The number of enterprises that answered this question is 150.
Source: World Bank Enterprise Survey – Benin (2009).

Figure 34A: Type of financing of fixed assets



Notes: Question asked in the Enterprise Survey: "Over fiscal year [2009], please estimate the proportion of this establishment's purchase of fixed assets that was financed from each of the following sources? The number of enterprises which answered this question is 62.