

*Full Length Research Paper*

# Agricultural services on the demand and supply for improving agricultural productivity in Benin

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The Beninese government has undertaken far-reaching reforms in the agricultural service supply in Benin since 2016. The objective of the article was to assess the level of satisfaction of the agricultural services supply and demand and to analyze the determinants of the level of satisfaction of agricultural services in Benin. The primary data used was provided from entire national territory by taking into account all agricultural areas from a representative sample of 4,880 farmers using the seven Territorial Agencies for Agricultural Development (ATDA). Descriptive statistics and the ordered logit predictive model were the methods of analysis. The results showed an overall satisfaction rate of 18.9%. These results reflect a low level of satisfaction of farmers in Benin. The main determinants of satisfaction with the agricultural services supply were gender, proportion of income from agriculture, contact with an agricultural advice agent, use of chemical fertilizer, use of motorized traction and access to improved seeds/planting materials/suckers. As a result, efforts remain to be made to meet the demand of farmers in providing agricultural service by a better coverage of agricultural services to improve farmers' income and contribute to food and nutritional security and improved living conditions.

**Key words:** Agriculture, satisfaction, agricultural service, food security, Benin Republic.

## INTRODUCTION

In the south Sahara countries, the supply of agricultural services by public institutions was widely denounced from the 1980s. The main limits of this system were its low efficiency, high cost and poor adaptation to the real needs of producers. Many studies have illustrated the

process of state withdrawal, the emergence of private providers and the establishment of various forms of coordination between public and private actors in the field of services (Hubbard, 1995). From the late 1990s, studies highlighted the drawbacks of service systems based on

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market coordination, highlighting market failures and the processes of exclusion of small producers from access to agricultural services (Kidd et al., 2000).

The development of agricultural services adapted to small producers thus remains an important issue for agricultural and rural development. The need to find forms of coordination to limit the pitfalls of pure hierarchical models (state model) on one hand, and pure market models (private model) on the other hand, remains an important issue.

To improve the situation of the beninese agricultural sector, the government has initiated a restructuring of institutions as a prerequisite for any sector reform to materialize this vision through the creation of wealth and jobs, the reduction of food and nutritional insecurity, while strengthening the flow of export products. This restructuring of institutions in the agricultural sector was marked by the weakening of the local services deployed by the Ministry of Agriculture, Livestock and Fisheries (MAEP), concomitant with its predominant role in the marketing of a certain number of production factors has had a strong impact on the performance of farms (Bene, 2017). At the same time, the conditions for the development of a private sector of agricultural services supplementing the services of the state were not met, in particular because of the control of the state on a certain number of key sectors (inputs, cotton sector, etc.).

The sector reform proposed by the government, since 2016, has led in particular to the operationalization of the National Fund for Agricultural Development (FNDA) and the creation of seven Territorial Agricultural Development Agencies (ATDA) intended to support the development of sectors priorities and farms.

Basically, this reform, which is based on a clear division of roles between the state and the private sector, opens up new development opportunities for farms. It is in fact a refocusing of the MAEP's missions on its sovereign functions, and the sharing of production support functions (advice, supply of inputs, etc.) and development value chains with the private and professional sector.

Given the importance of agricultural services for family farmers, it is urgent to make these services more responsive in order to improve the availability, accessibility and efficient mobilization of agricultural innovations and technologies. This involves providing services that meet the needs of farmers for improving their productivity and production to higher levels and establishing sustainable food and nutrition security.

Some work in the literature has analyzed the satisfaction of agricultural stakeholders which were delivered by the public and private sector in Benin (Adégbola et al., 2017). However, since the deep reforms that took place in the agricultural sector in 2016, no study has been carried out on the supply and satisfaction of agricultural services in Benin.

The objectives of this study were in two folds: (i) to

assess the level of satisfaction of agricultural advice and, (ii) to analyze the determinants of the level of satisfaction with the agricultural service supply in the agricultural sector in Benin.

### **Conceptual framework of the study**

Agricultural services refer to market activities (supply of inputs and equipment, credits, veterinary care, various certifications) and non-market activities (extension, advice, and training) necessary to improve the performance of farms/agricultural enterprises, their access to markets and their ability to compete (DCED, 2001; Bourou and Havard, 2011). This is a heterogeneous set that can be oriented towards the production of a product (example of the pineapple sector) or towards support for a process (case of the organization of farmers).

The main services considered in the context of this study are shown in the following.

#### ***Agricultural inputs***

Agricultural inputs have grouped together all the products brought to land and crops to improve crop yields, but which do not come from the farm or its proximity. In plant production, agricultural inputs have been: chemical or organic fertilizer products (fertilizers and amendments), phytosanitary products (pesticides), growth activators or retarders (example hormone products and ethephon intended to accelerate exterior coloring of pineapple), seeds and plants. In animal production, inputs included feed (simple and compound), feed supplements, broodstock/breeders (including chicks), drugs and veterinary/health services/products. In fish production, it has been grouped into inputs, feed and food supplements, fingerlings, amendment and cleaning products (lime, etc.), chemical and organic fertilizers.

#### ***Agricultural advice***

Agricultural advice in Benin is a support process that globally includes: (i) the Management Advice to Agricultural holdings (CGEA) which is the process of supporting farmers to master management tools, decision-making for the sustainable improvement of the economic and financial profitability of their operation; (ii) the Specialized Technical Advice (CTS) which essentially aims to support producers in identifying by themselves the constraints that hinder the improvement of agricultural productivity, to train producers on the application of technologies in response to their concerns and to get them to apply and adopt technical innovations to improve

the productivity and profitability of their operations; (iii) the Market Access Advice (CAM). Channels of access to agricultural advice include, among others, public sector supervisors, private sector/NGO supervisors, radio, television, telephone, social networks, researchers, etc.

### **Financial services**

The current landscape of farm development financing is characterized by a complex set of instruments, mainly linked to subsidy mechanisms, which do not favor the structuring of a local service offer (Bene, 2017). Four main types of mechanisms are present: (i) direct subsidies to farmers by projects (generally in the form of shared financing), under defined conditions, over limited periods, (ii) "indirect" subsidies which facilitate access of farms to certain services (mainly agricultural inputs and equipment), (iii) seasonal credits implemented in the cotton sector, or by certain private operators, (iv) banking services delivered through microcredit institutions. The assessment of the satisfaction of farms with regard to financing services will be evaluated by targeting more specifically sustainable services: decentralized financial systems, contractual agriculture, agricultural insurance (Universal Health Insurance Regime (RAMU), Mutual Agricultural Insurance of the Benin (AMAB)).

Satisfaction in this study is conceptualized as the effective response of a farmer to agricultural services. More precisely, we used the same concept provided by Raboca (2006) which defines satisfaction as the satisfaction of certain previous expectations related to a product or a service. Farmers' satisfaction with the agricultural services can be affected by several factors (Elias et al., 2015) such as personal and agricultural characteristics (age, education, family size, size of land and livestock ownership), perceived economic performance, the perceived relevance of the package, the participatory nature of the program, multiple communication methods, access to credit and training, frequency of extension contacts and years of experience participating in the service (Figure 1).

As Bateau et al. (2013), the service relationship constitutes a complex interaction involving two systems of representations that are the universe of users/customers and the universe of service providers. The universe of client users arises from a mental field nourished by beliefs, experiences and information specific to each individual, which structures the user's perception of the service provided (Bateau et al., 2013). The authors emphasize that the user's mental field is both the source and the theatre of the service experience: the place where the expected service is generated and where the perceived service is decoded.

The satisfaction model developed by Oliver (1980) and detailed by Parasuraman et al. (1985), used in this study,

considers that the expectations of users of agricultural services are determined by four (4) main elements (Figure 2). These are (i) the needs which users seek to be satisfied, (ii) the past experience of the offer, (iii) communication from providers to users and (iv) from mouth to ear, positive or negative on the offer. This model underlines in particular the difficulty there is in measuring satisfaction insofar as it is a subjective concept, that is to say a concept of the order of feeling specific to users and which cannot be 'does not exist absolutely but only by comparison (Oliver, 1980; Bateau et al., 2013). In addition to this subjectivity, satisfaction also has an evolving character, depending on when it receives the service, the user's perception and expectations differ. Avoiding this bias assumes that we can "dig into" the answers to better understand their meaning, and therefore avoid dispersing the questioning themes too much.

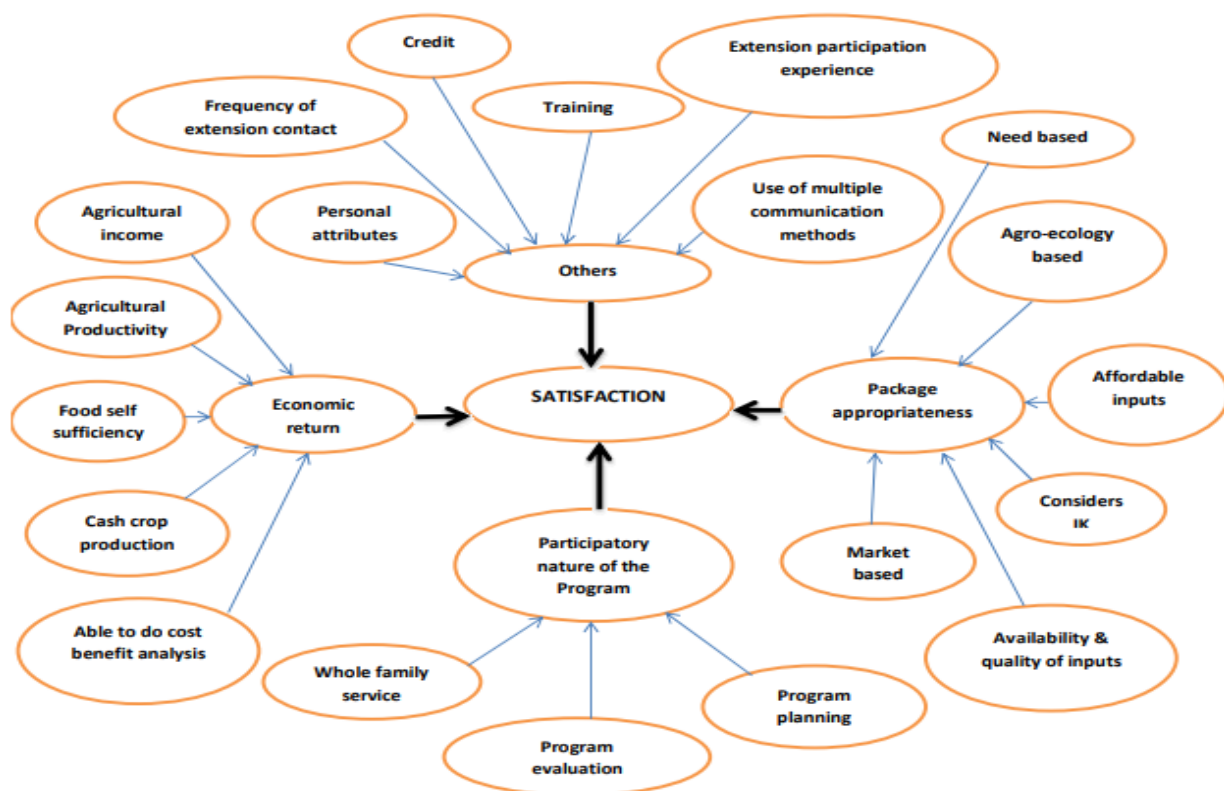
## **MATERIALS AND METHODS**

### **Study area and sampling**

The study was carried out on the whole extent of Benin's territory and in all the municipalities to collect primary data. The satisfaction survey requires both qualitative and quantitative data. The categories of actors considered in this study were service providers (public and private, including OPA) and farms. Qualitatively, 23 focus groups were conducted with farmers through a group discussion per selected municipality and 68 agricultural service providers were interviewed using an interview guide. Quantitatively, the data was collected from a representative sample size. Satisfaction rates were assessed among farms/agricultural businesses that actually have access to the various services considered (Table 1). The number of farms surveyed in each department is presented in Table 1.

### **Sampling procedure**

The sampling technique was as follows: (i) initially, the clusters were distributed by department in proportion to the weight of agricultural holdings. The number of clusters ( $V$ ) to be sampled in each department is determined by  $(V = n_c / n_v)$ , with  $n_c$  the sample size in the department and  $n_v$  the number of farms to be selected in each cluster. This number ( $n_v$ ) is set at 20 to allow the data collection team to do approximately 2 days per cluster. The clusters were coincident with the Agricultural Enumeration Zones (ZDA). In each department, the clusters were drawn at random from the list of ZDAs available at the level of the Directorate of Agricultural Statistics (DSA); (ii) the list of farms existing in each ZDA was obtained from the 2018 National Agricultural Census (RNA) notebooks, in order to constitute a sampling frame; (iii) in each ZDA, the farms were numbered from 1 to  $m$ . Then systematic sampling was carried out. The principle was to first calculate the "pitch" of the survey  $r = m / n_v$ . Then, a natural number  $d$  between 1 and  $r$  was chosen at random. The farm with the



**Figure 1.** Factors affecting the satisfaction rate of farmers. Source: Elias et al. (2015) and modified

number corresponding to  $d$  was the first farm. To select the other farms, it was enough to add  $d$  to the pitch for the survey  $r$ : the farms chosen were then those whose numbers correspond to:  $d$ ,  $d + r$ ,  $d + 2r$ ,  $d + 3r$ ,  $d + 4r$ .

**Data analysis methods**

The quantitative data made it possible in particular to calculate the various user satisfaction rates. To calculate these satisfaction rates, the formula used depends on how the questions were asked. Thus, for binary questions such as "are you satisfied: yes/no", the satisfaction rate is the rate of individuals having chosen "yes"; that is, the number of people who chose "yes" divided by the number of people using (or having access to) the service in question. For questions with the Likert rating scale "very dissatisfied", "somewhat dissatisfied", "somewhat satisfied", "very satisfied"; the satisfaction rate is obtained by adding the "somewhat satisfied" and "completely satisfied" divided by the number of people who have used (or have access to) the service in question. After the calculation of the various indicators, a descriptive analysis of all the indicators was carried out. This consisted of making graphs and calculating mean values and standard deviations.

The ordered logit model was used to identify the determinants of satisfaction. This model has been widely used in empirical studies to analyze ordered responses (Greene and Hensher, 2009; Elias et al., 2015). The dependent variable was measured using a 4-point

Likert scale.

We consider  $Y_i$  the level of satisfaction of a farmer, defined as:

$$Y_i = \begin{cases} 1: \text{Very dissatisfied} \\ 2: \text{Somewhat dissatisfied} \\ 3: \text{Somewhat satisfied} \\ 4: \text{Very satisfied} \end{cases} \quad (1)$$

where  $Y$  is a categorical variable indicating that a higher value means better satisfaction with the agricultural service. In this case, there is a known natural number ( $m$ ), such as:

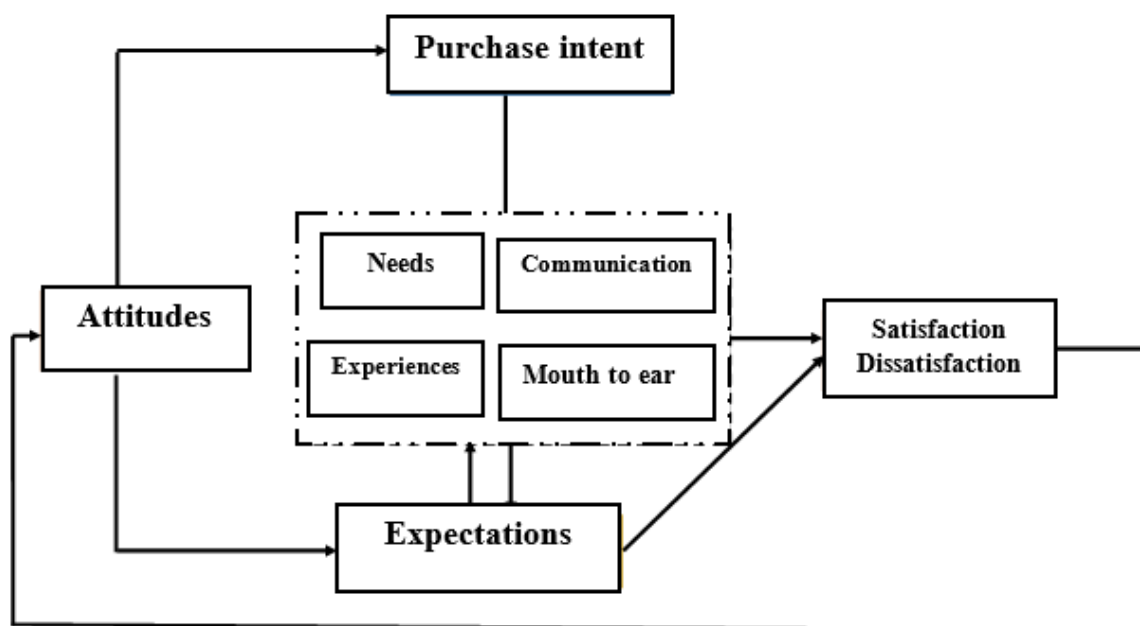
$$P = [y_i \in \{1, 2, \dots, m\}] = 1 \quad (2)$$

A latent (unobserved) variable model is widely used for these types of data and can be written as:

$$Y_i^* = \alpha + \beta_i X_i + \epsilon \quad (3)$$

Where  $Y_i^*$  is latent (unobserved), measure the level of satisfaction of the farmer;  $X_i$  is a vector of explanatory variables;  $\beta_i$  and  $\alpha$  are the coefficients to be estimated, and  $\epsilon$  is a random error term (assumed to follow a standard normal distribution for logistic distribution).

For an econometric specification, an ordered logit was used and



**Figure 2.** Oliver's adapted satisfaction model.  
Source: Oliver (1980) and modified.

the logistic distribution function was presented as follows:

$$F(x) = \frac{\exp(x)}{1+\exp(x)} \quad (4)$$

STATA 15 software was used to analyse the data. The validation of the ordered logit model was done with the likelihood ratio, the probability of which must be less than the 5% threshold. The variables retained for this purpose in the model are those which were significant at the 1, 5 or 10% threshold.

The definition of the explanatory variables of the model and their nature are shown in Table 2. Based on Elias et al. (2015), such variables are identified as factors affecting the satisfaction rate of farmers/users. Personal attributes of farmer/user were captured by the variables level of education and sex. The effect of agricultural income on satisfaction level was captured by the variable increasing the proportion of income from agriculture. Moreover, availability and quality of inputs were captured by the variables access to chemical fertilisers, access on the use of motorized traction (tiller, tractor). Finally, frequency of extension contact is taken into account by Contact with an MAEP officer or private agricultural advisory officer.

## RESULTS

### Demographic and socio economic characteristics of producers

Table 3 relating to the socio-economic characteristics of agricultural producers shows that their average age was 44 (12.5) years and that these producers are mostly young and open to innovations to improve the productivity

of their agricultural holdings. They had an average of 32 (10.5) years of experience in agricultural production. They were therefore for the most part very experienced in the agricultural field to be sufficiently imbued with the difficulties of access to agricultural finance and the experiences practiced in this field in recent years. Agriculture alone provided 79.8% of the income of farm household in the sample. Results showed that 70.5% of farm managers had access to advice on the use of chemical fertilizers while only 4.8% had contact with a Ministry of Agriculture, Livestock and Fisheries (MAEP in French) or private agricultural advice agent. In addition, only 7.4% received advice on the use of motorized traction and the majority of farm managers in the sample were men (90, 6%). The formal education rate remained low in the survey population because 63% of respondents have no education.

### Analysis of user satisfaction with key agricultural services in Benin

#### Global analysis of satisfaction with agricultural inputs

The results on the overall satisfaction rate with respect to inputs, by domain and department are shown in Table 4. The average satisfaction rate with respect to agricultural inputs in Benin was 90%. This rate is 88% for crop production, 50% for animal production, 7% for fish

**Table 1.** Distribution of the sample by department and sex of the farm manager.

Department	Gender of farm manager		Total
	Female	Male	
Alibori	19	537	556
Atacora	32	504	536
Atlantique	48	364	412
Borgou	5	614	619
Collines	59	451	510
Couffo	144	438	582
Donga	3	296	299
Littoral	0	19	19
Mono	43	232	275
Ouémé	14	206	220
Plateau	35	306	341
Zou	58	453	511
Benin	460	4 420	4 880

Source: Results from the PAPA-INRAB survey, 2019.

**Table 2.** Definition of ordered Logit model variables.

Variable	Description	Type of variable
<b>Dependent</b>		
SGLO	Satisfaction with agricultural service	ordinal
<b>Explanatory</b>		
CEAE4A	Gender of the farm manager	
CEAE6Ac	Educational level of the farm manager	Quantitative
CEAE14	Proportion of income from agriculture	Quantitative
MAEP01	Contact with an MAEP officer or private agricultural advisory officer	Binary: 1 = Yes and 0 = No
ENGR01	Access on the use of chemical fertilisers	Binary: 1 = Yes and 0 = No
TRAM01	Have used motorised traction at least once per season / year(tiller, tractor)	Binary: 1 = Yes and 0 = No

farming and 81% for fishing. These results show that it is in the field of fish farming that significant work to improve the quality of services offered to users is necessary compared to other fields.

The results indicated that the department of Atacora and those of the South (Oueme, Mono, Couffo, Zou and Atlantique) had relatively lower input user satisfaction rates than the other departments. In animal production, it is in Alibori and the Hills that user satisfaction rates have been high. In Atacora and Plateau, less than a third of farms were satisfied with the supply of input services used in animal production.

#### **Level of user satisfaction with agricultural advice**

Benin has a variety of support structures that support

populations in their economic activities. These are state structures, non-governmental organizations, cooperation organizations, producer organizations, and projects/programs. The support of these structures to producers is of several categories, including farm management advice (CGEA), specialized technical advice (CTS) and market access advice (CAM). The satisfaction rates of farms with respect to each category of advice, by department are shown in Table 5. Farms regardless of their production are satisfied at 17% for management advice to farms, at 13% compared to specialist technical advice and only 4% for market access advice. Analysis by department showed that these rates were higher in the departments of Borgou, Atacora, Collines and Plateau. Indeed, 50% of farms in the departments of Borgou and Atacora were satisfied with the management advice to farms.

**Table 3.** Socio-economic characteristics of agricultural producers.

Quantitative variable	Average	Standard deviation
Age (years)	43.8	12.5
Experience in agricultural production (years)	32.3	10.5
Proportion of income from agriculture (%)	79.8	23
Qualitative variable		Percentage
Advice on the use of chemical fertilisers	Yes	70.5
	No	29.5
Contact with a MAEP officer or agricultural advisory officer	Yes	4.8
	No	95.2
Have used motorised traction at least once (tiller, tractor)	Yes	7.4
	No	92.6
Sex	Male	90.6
	Female	9.4
Producer education level	No	63.4
	Primary	21.4
	Secondary	15.2

Source: Results from the PAPA-INRAB Survey (2019).

**Table 4.** Overall satisfaction rate (%) for agricultural inputs, by type and by department.

Department	Vegetable production	Animal production	Fish production	Fishing	All areas
Alibori	96.1	80.8	0	96.2	96.7
Atacora	93.4	25.9	0	66.7	93.4
Atlantique	75.3	48.5	11.5	77.6	82.5
Borgou	94.1	54.4	0	44.4	95.2
Collines	86.1	60.2	0	80	87.9
Couffo	94.9	49.7	9.1	61.5	95.6
Donga	94.1	54.4	0	66.7	94.8
Littoral	100	100	100	-	100
Mono	74.7	53.9	7.3	85.7	85.6
Ouémé	87	57.6	5.1	89.5	92.5
Plateau	82.2	31.9	14.3	70.6	85.5
Zou	72.7	40.8	5.7	65.1	76.5
Benin	87.5	49.8	7	80.5	90.1

Source: Results from the PAPA-INRAB Survey (2019).

### **Level of satisfaction of farmers with financing services**

The results presented in Table 6 showed that the satisfaction rate of farms in financial services during the 2018-2019 campaign in credits/loans was 75%. The

lowest satisfaction rates are noted in the departments of Zou (46%) and Atacora (54%). The results indicate that overall, user satisfaction rates with respect to credits/loans require improvement. In this sense, one of the wishes of users with regard to credit is to reduce the duration of the study of the file. Indeed, timely access to

**Table 5.** Satisfaction rate of the agricultural advice, by department.

Department	Satisfaction rate of the supply		
	CGEA	CTS	CAM
Alibori	5.3	5.3	0.0
Atacora	50.0	0.0	50.0
Atlantique	5.8	5.8	1.9
Borgou	50.0	50.0	50.0
Collines	33.3	33.3	0.0
Couffo	18.2	9.1	9.1
Donga	0.0	0.0	0.0
Littoral	15.8	15.8	0.0
Mono	20.0	18.2	3.6
Oueme	20.4	18.4	5.1
Plateau	28.6	14.3	0.0
Zou	20.6	5.9	2.9
Total	17.2	13.4	4.2

Source: Results from the PAPA-INRAB Survey (2019).

credit will allow the agricultural season to start quickly. Then, the reduction of the interest rate, the reduction of red tape, and the individualization of credit are also the expectations of the majority of users. In addition to this, some users want awareness and support in the use and management of credit. However, in some municipalities, there is a reluctance on the part of producers to contract loans from decentralized financial structures. Regarding savings, the satisfaction rate of farms is 90%, during the period 2018-2019. The lowest satisfaction rate was recorded in the Couffo department (75%). The quantitative results obtained were confirmed by the perceptions of the financial service providers interviewed. Indeed, some providers have recognized that the financial services offered have not always met users' expectations. This is explained by the fact that Micro-Finance Institutions do not have enough resources to meet the needs of users. In addition, 88% of farms were satisfied with the insurance products. The departments of Collines and Plateau presented the lowest rates.

#### **Determinants of farmers' satisfaction with agricultural service**

The results from the ordinal logistic regression are shown in Table 7 and showed that the logistic model is relevant to explore the effect of agricultural service related determinants on the dependent variable (probability of farmer satisfaction). As indicated in Table 7, sex of the producer, proportion of income from agriculture, contact with a MAEP agent or agricultural advice, the use of chemical fertilizers, and the use of motorized traction (tiller, tractor, supply of seeds/plants) were significant

determinants of farmers' satisfaction with agricultural service in Benin. The coefficient for the sex variable of the farm manager was positive and significant at the 1% level and reflects that male producers are more satisfied with agricultural services in Benin. If the model results show that the level of satisfaction depends of gender, this is only a reflection of the sociological reality of the agricultural landscape in Benin as in most of sub-Saharan Africa. Agricultural activity occupies an important place for women, but women farmers have relatively limited access to productive resources and services necessary for farmers. So a woman is less likely than a man own land or livestock, adopt new technologies, have access to credit or other financial services, or receive training or extension services (Green, 2010). It is social norms that systematically limit the options available to women. Thus, whatever the cause or extent, the disparity in wealth between men and women undermines the agricultural productivity of women and, as a result, carries wider economic and social costs.

Likewise, the coefficient of the proportion of income from agriculture is positive and significant at the 1% level and shows that producers are more satisfied with agricultural services as income from agriculture increases. Agricultural services promote increased farm income for producers and also improve social welfare. This justifies their satisfaction when the proportion of income from agriculture increases.

In addition, the coefficient, the variable contact with an MAEP agent or an agricultural advisory agent from the private system is positive and significant at the 1% level and reflects the fact that the more producers are in direct contact with agricultural advisers, the more they are satisfied.



**Table 6.** Satisfaction rate (%) of farms with financial services during the 2018-2019 period, by department.

Department	Credit/Loan	Saving	Insurance	Money transfer
Alibori	76.8	82.4	100	41.7
Atacora	54.4	89.5	100	44.1
Atlantique	77.8	91.7	100	44.4
Borgou	89.5	97.1	100	33.8
Collines	69.4	88	66.7	33.7
Couffo	100	75	0	74.4
Donga	78.3	94.1	0	60.6
Littoral	100	100	0	37.5
Mono	88.2	94.4	100	29.6
Oueme	79.7	80	0	60
Plateau	87	93.6	75	51.5
Zou	45.7	85.2	100	62.3
Benin	74.7	89.5	87.5	50.3

**Table 7.** Results of the ordered logistics model.

Variable	Coefficients	Standard Error
Sex of the farm manager	1.9***	0.3
Educational level of the farm manager	1.0	0.0
Proportion of income from agriculture (%)	1.0***	0.0
Contact with an MAEP officer or private agricultural advisory officer	7.0***	1.1
Have used chemical fertilizer once	3.4***	0.4
Have used motorized traction at least once (tiller, tractor)	1.3**	0.2
Have been supplied with seeds / plants / suckers	1.28***	0.11
Constant	0.0***	0.0
NUMBER OF OBSERVATIONS		4.500
LR Chi <sup>2</sup> (7)		412.2
PROB >F		0.00***
R <sup>2</sup>		0.1

\*\*\*: Significant at 1% level, \*\*: significant at t 5% level and \*: significant at 10% level.

Likewise, the coefficients of the variables use of chemical fertilizer, use of motorized traction (tiller, tractor) and supply of seeds/plants/suckers are positive and significant and reflect a high level of satisfaction of producers when they have access to agricultural inputs on these services.

## DISCUSSION

As shown in the results of the present study, the majority of farmers are dissatisfied with the agricultural services supply (only 18.9% were satisfied). This level of satisfaction is well below the average and those obtained by Abate et al. (2014) which was 62% in Ethiopia and

Dinar et al. (2007) around 57% in Greece. This low satisfaction rate raises the central question why producers are not satisfied. In light of the definition of Raboca (2006) the producers will be satisfied if agricultural supply service meets their expectations related to a product or service. Several factors determine user/farmer satisfaction. In relation to agricultural inputs, ease of access to inputs, a response to demand on the right date (permanent availability) and proximity to points of sale, and access to effective pesticides, are the factors that increase the level of satisfaction of farmers in Benin. According to users, ease of access to inputs must go through the subsidy of inputs and therefore the reduction of the unit cost and also the establishment of local shops to reduce tiring and discouraging long distances. As for

the timely satisfaction of demand, it includes the permanent availability of inputs and will put an end to stockouts.

Overall, the satisfaction rate of farms in relation to advisory support is relatively low, at 19%. In other words, approximately 8 out of 10 producers are not satisfied with the advisory support received during the 2018-2019 crop year. As a result, their expectations are not met. In fact, users expect global support for the promotion of all agricultural production activities and particularly for decision-making in relation to the management of their family farm. They also expect training that can help them better master management tools and better manage the factors of production available in their operation for the sustainable improvement of economic profitability. Users also wish to have training in marketing techniques in order to facilitate commercial negotiations with the various partners; training on contracting techniques. On the other hand, users want to have regular monitoring of stocks of agricultural products for their proper conservation. The expectations of users in relation to farm management are among others: training and workshops on farm management tools, farm monitoring. Finally, as the service providers interviewed during this study pointed out, the advisory support service offered to users is faced with the problem of the lack of specialized technicians for monitoring in the field. The lack of technicians is explained by the growing needs of the populations and by the professional environment.

With regard to the satisfaction rate in agricultural loans, users' expectations can be summed up as follows: (i) reduction in the costs of putting together the application file; (ii) granting of credit in cash or in the form of warrantage; decreasing the interest rate; (iii) setting up a remote payment mechanism or setting up functional counters in the village; (iv) increasing in the repayment period; (v) non rationing of credit. Indeed, users would positively appreciate an improvement in the interest rate applied by microfinance institutions on the funds saved. In addition, the hassle encountered when withdrawing savings, administrative delays and other external aspects related to the connection mean that users are not entirely satisfied with the savings services. User expectations on the level of satisfaction of savings can be summed up in securing the funds saved and facilitating the process of withdrawing savings.

### **Supply-driven instead of demand-driven agricultural service limits farmers' satisfaction**

The model results of satisfaction level determinants show that producer who used chemical fertilizer, or have used motorized traction (tiller, tractor) and have been supplied with seeds/plants/suckers and see the proportion of income from agriculture increasing are more satisfied.

They reflect the importance of the supply of agricultural services to farmers and are factors on which the demand for agricultural service is based. These results are proof that when the supply is adequate to the demand, it causes satisfaction on the part of the users. Indeed, chemical fertilizers, agricultural mechanization and access to quality seeds are real needs of farmers to boost the productivity of their farms. These results are consistent with previous literatures (Elias et al., 2015; Birner et al., 2009, DSA, 2006). Then, the existence of supply-driven instead of demand-driven agricultural service limits farmers' satisfaction.

### **Conclusion**

Agricultural service is important to strengthen the capacities of farmers and the performance of their farms. In Benin, the reform carried out in the agricultural sector over the past four years as part of the Government's Action Program is changing the institutional landscape of the country's agricultural service. The operationalization of agricultural service is part of the remit of seven territorial agricultural development agencies (ATDA) under the supervision of the Ministry of Agriculture, Livestock and Fisheries (MAEP).

With an average age of 44, Beninese farmers were mostly young and therefore, willing to adopt innovations and technologies aimed at improving agricultural productivity. Also, most of them had 32 years of experience in agricultural production. These socio-demographic and economic characteristics prove that by investing more in the improvement of services, agricultural productivity can be improved in order to achieve the objectives set.

The results of the present research indicate that in Benin the level of satisfaction of producers is still low (18.9%). The study points towards the need to the offer of agricultural service for an improvement in productive performance and their well-being.

### **CONFLICT OF INTERESTS**

The authors have not declared any conflict of interests.

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