Repositório ISCTE-IUL

Model for Quality Assessment in Small Farms in Cape Verde

Margarida Saraiva[1, *], Álvaro Rosa[2], Elsa Simões[3], António Ramos Pires[4]

[1] Management Department, School of Social Sciences, Universidade de Évora and Researcher at BRU-Business Research Unit / Iscte-Instituto Universitário de Lisboa, Portugal

[2]ISCTE – University Institute of Lisbon and BRU-Business Research Unit, Lisboa, Portugal

[3]School of Agricultural and Environmental Sciences at the University of Cape Verde, Praia, Cabo Verde

[4]UNIDEMI – New University of Lisbon and Polytechnic Institute of Setúbal, Setúbal, Portugal

Abstract

This study aims to perform a holistic quality assessment of Cape Verdean agricultural sector. To achieve this objective, we have constructed an innovative model – SQual4Agri – where the farming units' internal dimension, external context, and the productivity itself were all brought up together. It includes instruments to assess farmers' satisfaction toward the quality of services provided by the public departments, quality metrics to assess the organizational items in farming organization plus estimation of production. For the development of the (SQual4Agri) model, the researchers built a specific survey validated by experts in focus groups. After interpreting the collected data, the following phase was to adapt the instrument of the 5 Senses (5Ss) for small agricultural instances, and, finally, adapting the SERVPREF for the evaluation of rural services provided by official authorities. With the application of the SQual4Agri model in the Poilão Dam irrigation perimeter where seventy farmers were involved, we have concluded that it is quite needed and relevant the implementation of quality techniques and methodologies in agricultural production units. Another finding was, there is a lack of Cape Verde farmers' awareness and information upon benefits with organizational development with special regard to quality issues. This evidence is positively related to findings in prior studies by Simões and Saraiva (2014) and Simões (2018), conducted in the islands of S. Nicolau and Santiago, respectively. The third finding indicates widespread dissatisfaction with the services provided by the Ministry of Agriculture and the Environment of Cape Verde. Despite this dissatisfaction, it is perceived that the farmer is satisfied with his own activity. This contradictory element may show the fatigue and discouragement caused by the difficulties of agriculture in Cape Verde and difficulties in the implementation of public policies in this area. The application of the SQual4Agri model also indicates large potential for public policies changing in the rural contexts with impacts on efficiency, quality, and productivity.

Contents

20.1 Introduction

Agriculture in Cape Verde is essentially of family based and of small dimension and it has been, since the discovery of the archipelago, a factor of support for families and development, despite numerous factors that limit it. The most threatening ones are the lack of water resources, characterized by erratic and unpredictable patterns of precipitation and lack of arable soil, insularity,

and the orography of the islands (MAAP, 2005). To mitigate and minimize these limitations, the country has been investing for more than 40 years in public policies aimed at soil conservation and increasing the availability of water for agriculture, through various water harvesting techniques, among which, the construction of dams, in order to conserve water after the rainy season, so that they allow the practice of agriculture throughout the year. The costs of building infrastructures (e.g. dam, reservoirs, water distribution systems, drip irrigation systems) are high and they need to be adequately monetized for the sake of productivity in addition to the increase the farmers' incomes and the desired poverty reduction. Poverty still affects 27% of the population and its majority lives in rural areas. As a matter of fact, one of the essential government goals of Cape Verde is to fight poverty, and this is reflected in several governance programs that were implemented in the past 20 years. There is a close link between food insecurity and poverty: low income makes difficult for families to access essential food. With the country's commitment to the tourism sector, there is a new window of opportunity for growth of the agricultural sector, consequently, an opportunity for improvement of agricultural producers' income and in the latest stage, to the well-being of the population. However, in view of the scarcity of resources, whether natural or financial, it is believed that the bet on quality is a way by which the investments already made can be made profitable, improving their efficiency and effectiveness.

The certification of agricultural products produced in Cape Verde is a valuable issue once it will naturally facilitate the access to the tourism market; however, the certification requires implementation of quality improvement programs (Ryglová et al., 2017; Simões, 2013) in the entire value chain of local farming business The characteristics of the farms advises the choice of the methodology of the 5 Senses (5Ss), as a basis for the continuous improvement of quality. The implementation of 5S provides cost reduction, increase of economic efficiency, and the improvement of the quality of the products. It is also known that quality is strongly related to cultural habits, making the implementation of any quality program a unique work of experimentation and adjustment (Ho, 1999; Ablanedo-Rosas et al., 2010).

The growth of a sector, in this case, the agricultural sector, depends on not only the economic agents but also the institutional economic factors that are expressed in public policies and carried out by the governmental agencies. Assessing the degree of satisfaction from the farmers' side and assessing where public programs could be improved and adjusted can contribute not only to reduce economic agents' dissatisfaction but also to improve the management of available resources.

Thus, this chapter aims to present a diagnostic and monitoring model – SQual4Agri – that assesses the quality of management processes in the agricultural production unit and the satisfaction of farmers toward governmental services in the rural business cluster. The model is built in a participatory manner, through focus groups, with farmers from the irrigation perimeter of the Poilão dam, in Cape Verde, who participated in the discussion of the pertinence of the issues and their adequacy. This chapter is structured as follows: after this brief introduction, the characterization of the Cape Verde archipelago and the study area will be addressed; then there will be a theoretical framework and a description of the methodology was used and, finally, the obtained results will be presented.

20.2 The Archipelago of Cape Verde

The archipelago of Cape Verde located in the Atlantic Ocean, 450 km off the western coast of Senegal, consists of 10 islands, divided between the islands located in the North and those in the South. The islands of the Barlavento, in the North, are Santo Antão, São Vicente, Santa Luzia, São Nicolau, Sal and Boa Vista, and the Sotavento islands in the South are Maio, Santiago, Fogo and Brava. Only 10% of its area (4,033 km^2) is potentially arable. The essential family character of the Cape Verdean agriculture consists of 45,399 farms, of which 33,309 under rainfed and 8,580 under

irrigated, the total area of the exploitation units is 36,456 ha, of which 31,692 ha are dedicated to rainfed and 3,913 ha dedicated to irrigation (RGA, 2015). In spite of the numerous factors that limit production, namely the cyclical droughts that lead to the drastic reduction of water resources, the lack of arable land, the insularity and the orography of the islands, agricultural production is still an important factor of support for families (MAAP, 2005). It is estimated that agriculture contributes 7.4% of GDP (MDR, 2004; INE, 2010). However, the country's economy is essentially service-oriented, despite that 38% of the population lives in rural areas, where the incidence of poverty is highest. The conclusions of a modeling exercise carried out in 2009, within the scope of the Comprehensive Africa Agriculture Development Program (CAADP)/Economic Community of West Africa States Agriculture Policies (ECOWAP), indicated that for every 1% of poverty reduction in Cape Verde, three-fourths results from the growth of the agricultural sector (DSERAN-MDR, 2015; MDR, 2012). This information has motivated public efforts to invest in agriculture, with emphasis on the construction of small and large surface water storage infrastructures, such as dams.

The increase in water availability for irrigation has allowed the passage from subsistence agriculture, practiced mainly in rainfed, in the production of corn and beans, to irrigated production, essentially in the production of horticultural products, roots and tubers, whose production is mainly channeled to domestic markets, therefore, to domestic food consumption (MAAP, 2005). Despite the advancement in the construction of these hydraulic systems in order to increase the water availability for agricultural production, there is still a strong need for investments in teaching agricultural and environmental sciences, in the training of technicians, farmers/producers, in investigation of the improvement of postharvest and packaging processes and the creation of logistic conditions such as the flow of production, from production areas to consumer markets (Ferreira, 2015).

Despite the growth of a country-wide market expressed in higher levels of demands in food, the increase in the supply, namely, the diversification of offer in fruit and vegetable has given a satisfactory response to the domestic demand. However, there are still challenges in the supply to hotels and restaurants due to the increase of tourists in the region (MTIE, 2013). The opportunity presented by the boom in tourism has to be addressed with strong commitment to quality, not only in the quantity of the product, but in total quality which will bring benefits throughout the value chain of agricultural production. The increase in the availability of water for production should result in an increase in production and productivity, with remarkable effects, not only on the standard of living (economic valuation), but also on the quality of life of the farmer/producer (MTIE, 2013).

The adoption of quality techniques and methodologies is very recent in Cape Verde and basically it falls into the reproduction of standardized systems and standards implemented in other geographical, social, and economic contexts different from those existing in Cape Verde. On the other hand, the quality vision has been fundamentally centered on the quality of the final product and not on the production process which would safeguard the benefits of those who buy and those who produce (Simões, 2013). The success of family farming business requires production, competitiveness, sustainability and market access ability, and management competence. The adoption of quality management systems would provide and reinforce all the above-mentioned factors (Lourenzani et al., 2008).

The Cape Verdean irrigated farms are essentially family owned and the output consists essentially of vegetables, fruit, roots, tubers, and sugar cane. The size of this kind of polyculture system ranges from 0.2 ha to 2 ha some authors consider this size of exploration "vegetable gardens" (Fonseca et al., 2014). Some previous studies (Nair, 2001; Reyes-García et al., 2012; Smith and Jehlicka, 2013) on tropical gardens have shown that these farming businesses accomplish excellent ecological, economic, and social functions and help explain the maintenance of local ecosystems (Reyes-García et al., 2012).

In spite of this, progress requires efforts in order to promote endogenous knowledge and training of the different actors so to enhance their sustainable exploitation (INIDA, 2016). For instance, the 5Ss methodology having been successfully applied in companies and industries of several branches and organizations and been proved to contribute to the sustainability of production through the optimization of resources may allow in the context of scarcity of resources, in the Cape-Verdean context, to contribute to the promotion of small agriculture, encouraging efficiency and effectiveness in the use of available resources, contributing to aspects of sustainability, as well as to increase farmer satisfaction.

20.3 Quality, the 5 Senses Program and Satisfactions

The term 5Ss was formalized, in 1980, by Takashi Osada (Lamprea et al., 2015). It is a methodology, which can be implemented in any organization or aspects of daily life (Delisle and Freiberg, 2014; Osada, 1991). Organizations use the 5Ss to lay the groundwork and the patterns for problem-solving and the foundation for a correct working environment for their teams (Ablanedo-Rosas et al., 2010; Hirano, 2009; Kobayashi et al., 2008). The original concept, developed by Osada, (1991), considers a valid practice for many environments and dimensions of life. Therefore, the 5S methodology must be suitable and adapted to each environment in which it is applied (Ablanedo-Rosas et al., 2010; Imai, 1986). Despite this, the result of several experiences in different countries has shown their relevance and their positive results, the most difficult part of which is to incorporate them into the daily practice of individuals (Jaca et al., 2014). The implementation of 5S requires training of people so that they can implement their own solutions (Davies, 2003; Ho, 1999). A balanced approach between the philosophical, methodological concept of Osada, (1991) and the technical or instrumental approach of Hirano (2009) can be the strategy to achieve the goals of the 5S, about achieving excellence in the workplace and in the processes (Lamprea et al., 2015; Kobayashi et al., 2008). On the other hand, quality can also be defined as the level that a group of essential characteristics able to satisfy the expectations and needs of the consumer (Zeithaml et al., 1990). In 1990, these same authors developed a quality tool, SERVQUAL, which uses a scale that assesses the gap between customer expectations and the provision of the service received to assess customer satisfaction with the service they receive.

Following this logic, that under the proposal of Zeithaml et al. (1990), the quality of service is defined as the gap or discrepancy that exists between customers' expectations and their perceptions. This scale consists of two sections with 22 questions, grouped according to the attributes that can be evaluated by customers. According to Cronin and Taylor (1994), there is a fundamental difference between the quality of service and consumer satisfaction, while the first is a long-term attitude, the second is a transitional judgment made based on the provision of a specific service. Thus, they propose the most suitable way is to consider quality as the customer's perception and not so much in the technical specifications of their production process, hence the importance of listening and understanding the needs and expectations of the customer/consumer (Mota and Nascimento, 2011), and for this, the SERVPERF model is applied. This model is based on the study by Zeithaml et al. (1990) and measures the perceived quality, which is, therefore, the evaluation/judgment that the consumer has about the global superiority or not of a supplier. This concept differs from objective quality, as it is a form of relative attitude, but not equivalent to satisfaction, and results from the comparison between expectations and perception of performance. Table 20.1 summarizes the five dimensions of the SERVPERF model.

TABLE 20.1

The Five Dimensions of the SERVPERF Model

Dimension	Meaning	Number of Questions
Tangibility	Physical facilities, equipment, appearance of personnel	4
Reliability	Ability to perform the promised service dependably and accurately	5
Responsiveness	Willingness to help customers and provide prompt service	4
Assurance	Knowledge of employees and their ability to inspire trust and confidence	4
Empathy	Caring individualized attention, the firm provides the customers	5
Total Statements		22

20.4 Methodological Procedures

Bearing in mind the nonexistence of quality programs implemented in small family agricultural production units in Cape Verde, we will perform for the present study the SERVPERF in order to diagnose the level of satisfaction of farmers in the perimeter of irrigation of the Poilão dam in relation to the public services of which they are beneficiaries; moreover, building on previous work to diagnose the level of implementation of the 5Ss Program in the islands of S. Nicolau and Santiago, Cape Verde (Simões and Saraiva, 2014; Simões, 2018), we will also diagnose the level of quality competence in the same sample of farmers. The aim is to develop a hybrid and multidimensional diagnostic tool (Awasthi et al., 2011; Mota and Nascimento, 2011; Yaya et al., 2012) for the assessment of quality management of agricultural production units and farmers' satisfaction. We believe this diagnostic procedure will play as an effective instrument for achieving improvements in the management of rural property and providing information adjustments in public policies and services aimed at these Cape Verdean farmers. The assessment model brings together three dimensions: production, quality, and satisfaction, in a perception questionnaire (SQual4Agri), resulting from the extension of an initial instrument, built from a diagnostic study, from the application of the 5Ss Program in five agricultural units on the island of S. Nicolau and one another applied to 34 agricultural units on the island of Santiago, both in Cape Verde (Simões and Saraiva, 2014; Simões, 2018). From this diagnostic questionnaire of the 5Ss, another component was added, the one referring to farmers' satisfaction, bearing in mind the public policies of which they are beneficiaries. The questionnaire was the output from a focus group of 15 farmers, all of them having agricultural production units in the Poilão dam. The focus group approach was essential in the construction of the questionnaire as it allowed obtaining information efficiently about what people think, feel, and understand how they act or react in relation to each individual item of quality (Boca, 2015; Oliveira and Freitas, 1998; Santos and Fogliatto, 2002). The SQual4Agri instrument consists of 79 items, divided into three sections: Production, Quality, and Satisfaction, are detailed in the dimensions of (1) EstProAgri, the (2) 5Ss tool, and the (3) modified SERVPERF, which constitutes the conceptual model applied in this investigation where the "S" means satisfaction/SERVPERF/Service, "Qual" means Quality represented by 5Ss, "4" means For and "Agri" means Agriculture (see Simões et al., 2021).

This chapter addresses only two of these parameters: (1) Quality through the diagnosis of the 5Ss and (2) Evaluation of farmers' satisfaction, through SERVPERF. The questionnaire was applied in two moments, the first to a pilot group of 20 farmers that included the 15 who participated in the focus group and who actively collaborated in the construction of the questionnaire and a second group of 50 farmers to whom the new survey was applied with entered adjustments. Table 20.2 presents the organization, variables, type, and scales of the questions presented in the questionnaire, based on the SQual4Agri Model.

TABLE 20.2

Organization of the Questionnaire, based on the Model SQual4Agri

	Organization	Variable Dimension	Item Number	Scale
Section II	Diagnosis of the Management Production Unit Quality	1st Sense of use (SEIRI)	5	Likert Scale of 3 levels and closed-ended questions
		2nd Sense of ordination (SEITON)	15	
		3rd Sense of cleanness (SEISO)	8	
		4th Sense of health (SEKETSU)	5	
		5th Sense of self-discipline, education, and commitment (SHITSUKE)	3	
Section III	Diagnosis of Farmers' Satisfaction	Tangibility	10	Likert Scale of 5 levels
		Reliability	5	
		Responsiveness	8	
		Assurance	14	
		Empathy	2	
		Global satisfaction	4	

20.5 Results

20.5.1 5 Senses in the Management of the Production Unit

Regarding the quality assessment in the management of the production units and in order to assess the questions of each dimension of the 5Ss tool, the following scoring criterion was generally used: compliant (C) – 2 points; partially compliant (PC) – 1 point; nonconforming (NC) – 0 points, in order to classify and quantify each Sense. Also, in the multiple-choice questions, it was necessary to assign this same scoring criterion, in order to achieve a score for each Sense, using the formula:

Score = (sum of points × 5)/(no. of sense issues), to make easier the individual analysis of each variable/sense and to classify it, on a qualitative scale (Bad: 0–2; Insufficient: 2–4; Sufficient: 4–6; Good: 6–8; Very Good: 8–10).

In general, on a scale of 0–10, the obtained scores for each Sense, together with the 70 respondent farmers, in the Poilão dam, were low and ranged within the same sense and between the senses. Thus, as was observed in the diagnosis prepared by Simões and Saraiva (2014) and Simões (2018), there is a necessity to raise awareness and inform farmers about the advantages of improvements, regarding quality issues, in the studied agricultural production units.

The obtained results show that the 3rd Sense of Cleanliness and Zeal and the 4th Sense of Health/Standardization showed the lowest score (4 – INSUFFICIENT), the 1st Sense of Use and 5th Sense of Self-discipline, Education, and Commitment (6 – GOOD) were evaluated with the same score and the 2nd Sense of Ordination (7 – GOOD) was the best score.

Some situations found and that need improvement are (1) how to dispose of the property's waste and wastewater, which is mostly done in nature and which, due to its environmental and health implications, must be considered; (2) the existence of excess scrap materials also deserves clarification from the target audience; (3) aspects likely to cause accidents; (4) maintenance of work

tools; (5) aspects of cleaning and hygiene on the farmer's property and personal hygiene, due to the impacts they may have on human, plant to animal health; (6) the supply of energy for lighting and the supply of water for domestic consumption. Despite these aspects that surely need significant improvements, the global results already show some attention from the farmer on them, which probably reflects his good motivation to implement a program like 5Ss. Table 20.3 presents the obtained results for each of the 5Ss questions, based on the SQual4Agri Model.

TABLE 20.3

Obtained Results for Each of the 5 Senses Questions, Based on the SQual4Agri Model

1st Sense of Use (SEIRI)	**Score/Classification**
The tools/equipment/agricultural inputs necessary for the work have their own storage place	PC
Easy access to the tools/equipment/agricultural inputs necessary for the job	PC
Conservation status of tools/equipment/agricultural inputs necessary for the job	PC
There are no excess or unnecessary materials and objects on the property (leftover materials, irrigation pipes, drums, unused machines, others)	PC
What is the main mode of evacuation of materials (garbage) in cleaning	PC
Partial score = (Sum of Points ×5)/(No. of Sense Issues)	**6**
Classification	***Good***
2nd Sense of Ordination (SEITON)	
The property is demarcated and/or identified	PC
The various subplots within the property are well demarcated and identified	PC
Existence of water tubes and/or other exposed wires/tubes preventing the passage or allowing an accident	PC
Existence of scrap material in the area	PC
Personal objects are kept in a specified location	PC
The circulation space allows the traffic of people and equipment without danger of incidents	PC
Existence of proper place for pesticide storage	PC
The agricultural producer checks the expiration dates of the pesticides	C
Existence of a suitable place for fuel storage	PC
The agricultural producer checks the expiration dates of the fertilizers	PC
The agricultural producer checks the expiration dates of the seeds	C
Defective equipment awaiting repair (hoes, cultivators, sprayers, motor pumps, etc.)	PC
Existence of motor pump and type of fuel	PC
Motor pump is protected	NC
If the pump is protected, what type of protection	PC
Partial score = (Sum of Points ×5)/(No. of Sense Issues)	**7**
Classification	***Good***
3rd Sense of Cleaning and Zeal (SEISO)	

Existence of tools and material available on the property to clean it.	PC
How often does the producer clean the property and its attachments	PC
How often does the producer maintain/clean work tools	C
Regarding hygiene has the property has a bathroom	NC
What are the main sources of dirt on the property	PC
What is the main source of energy that the owner uses for lighting	NC
What is the main mode of wastewater evacuation	NC
What is the main source of water supply	NC
Partial score = (Sum of Points ×5)/(No. of Sense Issues)	**4**
Classification	***Insufficient***
4th Sense of Health/Standardization (SEIKETSU)	
The personal hygiene of the producer shows cleanliness	PC
There are unsafe conditions likely to cause an accident in the work area	PC
The resting hours from work and for meals are adhered to	NC
The producer protects himself with suitable clothing when in the workplace	PC
The producer protects himself with suitable footwear when at the workplace	PC
Partial score = (Sum of Points ×5)/(No. of Sense Issues)	**4**
Classification	***Insufficient***
4th Sense of Health/Standardization (SEIKETSU)	
In general, the producer considers that the items mentioned in the questionnaire are important for the proper functioning of the property	NC
The producer would be willing to take responsibility for some of the tasks mentioned in the questionnaire, if it meant improving his well-being and the profitability of his work	C
What is the motivation for implementing a quality management program?	C
Partial score = (Sum of Points ×5)/(No. of Sense Issues)	**6**
Classification	***Good***
5th Sense of Self-Discipline, Education, and Commitment (SHITSUKE)	
In general, the producer considers that the items mentioned in the questionnaire are important for the proper functioning of the property	NC
The producer would be willing to take responsibility for some of the tasks mentioned in the questionnaire, if it meant improving his well-being and the profitability of his work	C
What is the motivation for implementing a quality management program?	C
Partial score = (Sum of Points ×5)/(No. of Sense Issues)	**6**
Classification	***Good***

Compliant (C) – 2 points; Partially Compliant (PC) – 1 point; Nonconforming (NC) – 0 points/Classification: Bad: 0–2; Insufficient: 2–4; Sufficient: 4–6; Good: 6–8; Very Good: 8–10.

20.5.2 Farmers' Satisfaction

Regarding each dimension of the diagnostic study, carried out through the modified SERVPERF quality program, a 5-level Likert scale was used to assess satisfaction: 1 – Not Satisfied (NS), 2 – Little Satisfied (LS), 3 – Satisfied (S), 4 – Very Satisfied (VS), and 5 – Totally Satisfied (TS). The Satisfaction calculation followed the recommendations of Zeithaml et al. (1990). Thus, the average score of the Satisfaction assessment over each dimension was obtained through the following two steps: (1) for each respondent, the SERVPERF scores were added to the responses belonging to the dimension and then the sum was divided by the number of questions, which make up the dimensions; (2) the score obtained in step 1 was added to all 70 (N) respondents and the total divided by 70 (N). In general, on a scale of 0–5, the obtained scores for each of the five dimensions of satisfaction assessed, together with the 70 respondent farmers, in the Poilão dam, were low. However, within the same dimension, differences can be observed that show concrete and transversal aspects that require more urgent improvements (e.g. communication and technical assistance).

The obtained results show that the dimensions, Tangibility, Reliability, Responsiveness, Assurance, and Empathy were all evaluated with the same score (2 – little satisfied). Through the results, it is possible to verify the need for improvements:

- ***In the Tangibility dimension improving, namely:***
  1. the conditions for the reception and accessibility of farmers in the ministry delegation;
  2. equipping technicians with basic equipment for fieldwork;
  3. technical assistance in the field and regular visits by technicians and the delegate.
- ***In the Reliability dimension, it is observed that:***
  1. the issues of communication between the beneficiaries and the government need improvement, with regard to the better and greater involvement of farmers, in the development processes of the irrigation perimeter at the dam;
  2. trust (Reliability) in the institution to solve its problems and the deadline for resolving issues.
- When it comes to the Responsiveness dimension, it is clear that the ministry delegation has little responsiveness when it comes to assisting the farmer and with regard to technical assistance for irrigation systems, pests, livestock, production planning, information about markets and training.
- The **TRUST/SECURITY/ASSURANCE** dimension shows:
  1. lack of confidence in technicians working in the delegation of the Ministry of Rural Development (MDR) of Cape Verde;
  2. they resent their little involvement in projects and programs developed by the ministry;
  3. they have little security in their own activity;
  4. difficulties in placing their products on the market, in the price of products and in the flow and delay in responding to their complaints.
- In the **EMPATHY** dimension, it is perceived that the farmer expects greater and better attention in crisis situations and expects more collaboration to improve his productive activity. Although the results tend to indicate widespread dissatisfaction with the services provided by the Ministry of Agriculture and the Environment, there are differences in assessments from item to item within each of the five dimensions. This makes possible the identification of where dissatisfaction is greatest and can possibly been addressed in future policy planning. Despite little satisfaction demonstrated in the five dimensions, it is clear that the farmer is satisfied with his own activity. The general perception of satisfaction comes from the willingness to recommend this activity to their offspring or friends. Although some tiredness and discouragement demonstrated possibly due to inherent difficulties of the agriculture and unsatisfactory public policies, the farmers responded negatively when asked if he would change his profession if he could. Table 20.4 presents the results obtained for the six dimensions of the modified SERVPERF, based on the Model SQual4Agri.

TABLE 20.4

Obtained Results for the Six Dimensions of the Modified SERVPERF, Based on the Model SQual4Agri

Tangibility	Score/Classification

Reception conditions at the MDR Delegation	LS
Accessibility of the facilities of the MDR Delegation	LS
The technicians who assist us have materials and equipment	LS
The regularity of visits by MDR technicians	LS
Alternative technical assistance services to MDR	LS
The regularity of visits by the MDR delegate	LS
The UGBP water management service	S
Market availability of the varieties of seeds I grow	S
The increasing level in my production in the last 5 years	S
The diversification of the cultures I produce	S
Average	**2**
Classification	*Little Satisfied*
Reliability	
Information I receive about the development goals of the Poilão Dam perimeter	LS
The collaboration of the delegation to solve my problems	LS
The services and support that the delegation has	LS
The deadline for problem-solving	LS
The price of water	LS
Average	**2**
Classification	*Little Satisfied*
Responsiveness	
The technical assistance provided by the delegation	LS
Technical assistance for the installation and operation of my irrigation systems	LS
Technical assistance for pests and diseases	LS
Technical assistance for livestock	LS
Information to schedule my production	LS
The trainings organized by the MDR are important for my activity	LS
The way I am waited in the delegation	LS
Management and distribution of irrigation water	S
Average	**2**
Classification	*Little Satisfied*
Assurance	

My participation in the projects and programs developed by MDR	LS
I feel respected by the technicians	LS
The technicians are friendly and polite	S
Trust in the technicians who work in the Delegation	LS
Confidence in the technical information they provide me	LS
I know my rights and duties	S
The security and profitability of my agricultural activity	LS
Placing my production on the market	LS
The price at which I sell my product	LS
Information given on changes to irrigation schedules	S
Information I get about collaboration possibilities	LS
Information on changes in production support projects and programs	LS
Respect for my opinion and suggestions	LS
Replies to my complaints	LS
Average	**2**
Classification	*Little Satisfied*
Empathy	
Technical visits in unforeseen situations	LS
The technicians talk to me about what I do well and what I need to improve	LS
Average	**2**
Classification	**Little Satisfied**
General Satisfaction	
In general, what is your degree of satisfaction	S
Would you pay for quality technical assistance?	YES
How much you would pay per month	500–1,500 CVE
Would you recommend farming to your friend or your child?	YES
If you could, would you change your professional activity?	YES

1 – Not Satisfied (NS), 2 – Little Satisfied (LS), 3 – Satisfied (S), 4 – Very Satisfied (VS), and 5 – Totally Satisfied (TS).

20.6 Final Considerations

The construction of the Poilão dam, aiming at the storage of water to use in irrigated agricultural production, presents itself from the point of view of this objective, as an appropriate measure of public policy, since the potential it holds promises to contribute positively in the poverty reduction and ensuring food security. However, for these objectives to be achieved, it is necessary

that their beneficiaries/users have an active participation and that other public policy measures (e.g. research, rural extension, training) are adjusted to the needs of these users, in order to contribute to the achievement objectives as efficiently and effectively as possible. The implementation of quality methodologies and tools can contribute to this. The implementation of the 5Ss Methodology contributes significantly to success, which corroborates the arguments of Michalska and Szewieczek (2007), as it increases organizational performance, including cleanliness, health, and safety, as mentioned by Hirano (2009), as well as increasing capacity and productivity, which is also in line with Ab Rahman et al. (2010).

Assessing the satisfaction of farmers/users, through their perception of the quality of the benefits/services they receive is important, as their positive or negative perception plays an important role in the success or failure of the service or project, which confirms the conclusions of Fragoso and Espinoza (2017), Huang (2011), Rana et al. (2013), Reddy et al. (2013). From the analysis of the results of the study, the importance and relevance of the application of quality techniques and methodologies in agricultural production units is evident, and there is also a lack of greater awareness and information from farmers about their advantages, with regard to the issues of quality in the agricultural production units under study, according to what had already been observed in the studies by Simões and Saraiva (2014) and Simões (2018), respectively, on the island of S. Nicolau and on the island of Santiago.

The results tend to expose widespread dissatisfaction with the services provided by the Ministry of Agriculture and the Environment. Despite this dissatisfaction, it is clear that the farmer is satisfied with his own performance and business. This contradictory element may show that there is some tiredness and discouragement caused by the difficulties inherent to agriculture in Cape Verde and difficulties in the implementation of public policies in the area. We consider the application of these tools promotes: the most efficient use of available resources; increased productivity and more organized work environments; changing behavior and adopting more proactive attitudes; better use of physical spaces and reduction of accidents at work; greater discipline; an increase in cleanliness levels; greater collaboration between people and the improvement of human well-being; and an incentive, creativity and a commitment to continuous improvement (Simões and Saraiva, 2014). Scientific work, especially in the application of quality tools in the agricultural area, in Cape Verde, is scarce, so this work is of particular interest, both for what it represents for scientific development in general and for its practical application, which could be extremely useful for organizations in the sector. On the other hand, the smallness of the country is offset by the diversity of agricultural production systems, cultures and traditions in different regions. This scenario inhibits the generalization of results and requires a specific look at each reality.

In view of these scenarios, future research is considered essential, which allows a reevaluation: the motivation and interest of farmers; know and compare other areas of the country, due to the uniqueness that each one will have in the training process; the effectiveness of the implementation of quality programs, in particular in their contributions not only to the quality of the products, but also to the quality of life of the producers.

References

Ab Rahman, M. N., Khamis, N. K., Zain, R. M., Deros, B. M., and Mahmood, W. H. W. 2010. Implementation of 5S practices in the manufacturing companies: A case study. American Journal of Applied Sciences, 7(8), 1182–1189.

Ablanedo-Rosas, J. H., Alidaee, B., Moreno, J. C., and Urbina, J. 2010. Quality improvement supported by the 5 S, an empirical case study of Mexican organizations. International Journal of Production Research, 48, 7063–7087.

Awasthi, A., Chauhan, S. S., Omrani, H., and Panahi, A. 2011. A hybrid approach based on SERVQUAL and fuzzy TOPSIS for evaluating transportation service quality. Computers & Industrial Engineering, 61, 637–646.

Boca, G. D. 2015. 5 S quality management. Oradea: University of Oradea.

Cronin, J. and Taylor, S. 1994. SERVPERF versus SERVQUAL: Reconciling performance-based and perceptions-minus-expectations measurement of service quality. Journal of Marketing, 58(1), 125–131.

Davies, E. C. 2003. Quality: Its historical context. Engineering Management, 13(2), 14–17.

Delisle, D. R., and Freiberg, V. 2014. Everything is 5 S: A simple yet powerful lean improvement approach applied in a preadmission testing center. Quality Management Journal, 21(4), 10-22.

DSERAN-MDR. 2015. Perímetro Irrigado da Barragem do Poilão: Estudo Socio-económico dos produtores/irrigantes. Sal - Cabo Verde: MDR.

Ferreira, V. S. 2015. Conflitos e participação no uso da água da Barragem de Poilão, (1a ed.). Praia: Imprensa Nacional.

Fonseca, C., Guiomar, N., and Pinto-Correira, T. 2014. Estimativa da Produção Hortícola Potencial no Concelho de Montemor-o-Novo. Évora: ICAAM-Universidade de Évora.

Fragoso, J. T., and Espinoza, L. 2017. Evaluation de la perception de la calidad de los servicios bancarios mediante el modelo SERVPERF. Contaduria y Administración, 62(4), 1270–1293.

Hirano, H. 2009. JIT Implementation Manual – The Complete Guide to Just-in-Time Manufacturing. The ´5S´ approach. Boca Raton, FL: CRC Press, 237–319.

Ho, S. K. 1999. 5-S practice: The first step towards total quality management. Total Quality Management, 10(3), 345–356.

Huang, L. C. 2011. The measurement of the service quality of rural wineries. Journal of Marketing Development and Competitiveness, 5(5), 29–45.

Imai, M. 1986. Kaizen. New York, NY: Random Business Division.

INE. 2010. Recenciamento Geral da População e Habitação. Obtido de Instituto Nacional de Estatísticas de Cabo Verde.

INIDA. 2016. Plan Strategique 2015-2022 du Systeme National de Research Agricole du Cape Verde. Praia - Cabo Verde: FAO.

Jaca, C., Viles, E., Paipa-Galeano, L., and Mateo, J. S. 2014. Learning 5 S principles from Japanese best practitioners: Case studies of five manufacturing companies. International Journal of Production Research, 52(15), 4574–4586.

Kobayashi, K., Fosher, R., and Gapp, R. 2008. Business improvement strategy or useful tool? Analysis of the application of the 5S concept in Japan, the UK and the US. Total Quality Management, 19(3), 245–262.

Lamprea, E. J., Carreño, Z. M., and Sánchez, P. M. 2015. Impact of 5 S on productivity, quality, organizational climate and industrial safety in Caucho Metal Ltda. Ingeniare. Revista chilena de ingeniería, 23(1), 107–117.

Lourenzani, W. L., de Barros Pinto, L., Alves de Carvalho, E. C., and do Carmo, S. M. 2008. A qualificação em gestão da agricultura familiar: A experiência da alta paulista. Revista Ciência em Extensão, 4(1), 62.

MAAP. 2005. Estratégia de Desenvolvimento Agrícola no horizonte 2015. Praia- Cabo Verde: MAAP.

MDR. 2004. Recenceamento Geral Agrícola. Praia - Cabo Verde: Ministério do Desenvolvimento Rural.

MDR. 2012. Relatório de Elaboração DECRP-III/2012-2016. Praia - Cabo Verde: QIR-CV-OMC.

Michalska, J., and Szewieczek, D. 2007. The 5S methodology as a tool for improving the organization. Journal of Achievements in Materials and Manufacturing Engineering, 24(2), 211–214.

Mota, G. S., and Nascimento, D. R. 2011. Qualidade em Serviços de Atendimento ao Consumidor (SAC): Uma avaliação utilizando a escala SERQUAL e os critérios INMETRO. Gestão.org, 9(3), 565–584.

MTIE. 2013. Diagnostic trade integration study update. Praia - Cabo Verde: MTIE.

Nair, P. K. 2001. Do tropical homegardens elude science, or is it the other way around?. Agroforestry Systems, 53, 239–245.

Oliveira, M., and Freitas, H. 1998. Focus group, pesquisa qualitativa: resgatando a teoria, instrumentalizando o seu planejamento. RAUSP Management Journal, 33(3), 83–91.

Osada, T. 1991. The 5S's: Five keys to a total quality environment. Tokyo: Asian Productivity Organization.

Rana, A. S., Reddy, G. P., and Sontakki, S. 2013. Perceived service quality of agricultural organizations comparative analysis of public & private sector. International Journal of Advanced Research in Management and Social Sciences, 2(1), 286–295.

Reddy, G. P., Reddy, A. A., Sontakki, B. S., and Rana, A. S. 2013. Engendering agricultural research and extension: Public-private partnership options. Indian Journal of Agricultural Economics, 68(3), 420.

Reyes-García, V., Aceituno, L., Vila, S., Calvet-Mir, L., Garnatje, T., Jesch, A., … and Pardo-De-Santayana, M. 2012. Home gardens in three mountain regions of the Iberian Peninsula: Description, motivation for gardening, and gross financial benefits. Journal of Sustainable Agriculture, 36(2), 249–270.

RGA. 2015. Recenciamento Geral Agrícola. Praia, Santiago: Ministério da Agricultura e Ambiente de Cabo Verde.

Ryglová, K., Rasovska, I., and Sácha, J. 2017. Rural tourism – Evaluating the quality of destination. European Countryside, 9(4), 769–788.

Santos, G. T., and Fogliatto, F. S. 2002. Grupos Focalizados: uma proposta de roteiro para identificação de atributos de referência. Anais. XXII ENEGEP – Encontro Nacional de Engenharia de Produção. Curitiba, PR.

Simões, E. 2013. Caracterização da qualidade física e química e sensorial da papaia Solo e Local da ilha de Santiago, Cabo Verde. Dissertação de Mestrado, Évora, Portugal.

Simões, E. B. 2018. Diagnóstico do Nível de Implementação dos 5S's em Propriedades Agrícolas, em três Municípios da Ilha de Santiago, em Cabo Verde. Revista TMQ – Techniques, Methodologies, and Quality, 9, 84–113.

Simões, E., and Saraiva, M. 2014. Cap. 8 – Diagnóstico do Nível de Implementação dos 5S's em Propriedades Agrícolas Cabo-Verdianas. Em M. J. Rosa, P. M. Sá, and C. S. Sarrico (Edits.), Qualidade em Acção: Casos de aplicação de ferramentas e metodologias de qualidade. Lisboa - Portugal: Edições Sílabo, 175–200.

Simões, E., Saraiva, M., Basch, G., Pires, A. R., Rosa, Á., and Chaleta, E. 2021. Hybrid conceptual model for assessing quality, production and satisfaction (SQual4Agri), in agricultural production units, in Cape Verde. Sustainability, 13(1), 37.

Smith, J., and Jehlicka, P. 2013. Quiet sustainability: Fertile lessons from Europe's productive. Journal of Rural Studies, 148–157.

Yaya, L. H., Marimon, F., and Fa, M. C. 2012. Assessing e-service quality: The current state of E-S-Qual. Total Quality Management & Business Excellence, 23 (11-12), 1478–3363.

Zeithaml, V. A., Parasuraman, A., and Berry, L. L. 1990. Delivering quality service: Balancing customer perceptions and expectations. New York, NY: The Free Press.