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## **An Overview of Small-Scale Farmers in Vegetable Production in Three Districts in Suriname**

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Caribbean states dependent on agricultural imports to secure the food and nutrition is needed by their population. Although Suriname, a former Dutch colony, covers 80% of tropical forest, suitable land areas for agriculture are not optimally used to produce the needed vegetables. The purpose of the study was to provide an overview of the vegetable production and to get a better understanding of the status and problems of the small-scale vegetable farmer in Suriname. To collect the data, a descriptive study was conducted to generate information about the current status of small-scale farmers in Suriname over the period 2012-2015. Results revealed that the agricultural production is low, the information flow from agricultural institutions to the farmer is minimal and that vegetable farmers are facing many challenges when producing food for local and international markets.

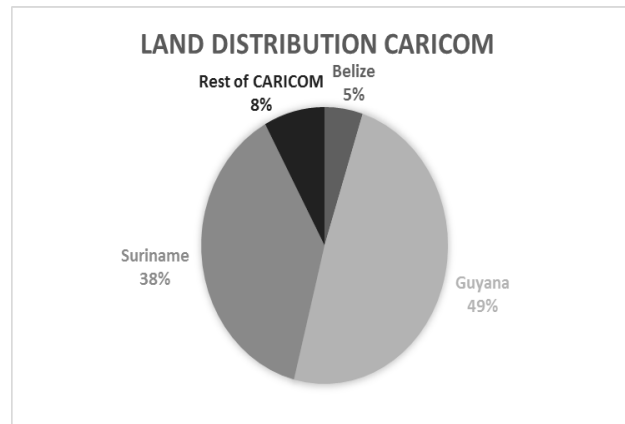
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### **Introduction**

Almost all Caribbean Community (CARICOM) countries import more than 60 percent of the food they consume, with half of them importing more than 80 percent of the food they consume. Only three countries (Belize, Guyana and Haiti) produce more than 50 percent of their consumption (FAO, 2015). Of all the CARICOM countries, Suriname has often been considered as the “food basket” for the region, meaning that it could be a potential food supplier for CARICOM countries. Together with Guyana and Belize, Suriname has the largest land surface of CARICOM suitable for the development of agriculture. Figure 1 illustrates that of the total arable land of approximately 4.9 million hectares in the CARICOM, Suriname has about 1.5 million hectares considered suitable for agriculture (ASP 2005-2010).

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**Figure 1.** Land distribution of the CARICOM (*Source: ASP 2005-2010*)

But these rich resources are currently not used to their full potential, even though about 25% of the population in Suriname is engaged in agricultural activities. The economic disparity between rural and urban regions is distinct and many farmers in Suriname live at the subsistence level. On top of that, they are often excluded from the country's formal banking system because the loans they need are too small to be profitable for banks and are perceived to be too risky as borrowers (Ricketts, 2013). Nowadays, agriculture is not considered as an attractive option. This is due to the fact that factors like the economy, knowledge transfer, geopolitics and functioning of the CARICOM have major impact on the choice of a person to go into farming or not.

According to the latest census (2008), there are 10,234 farm holdings in Suriname of which 66.5% reported crop production as their main activity while 18.2% reported livestock production as their main activity (including a few beekeepers and aquaculture farms) and 15.3% classified it as mixed. According to Roseboom in 2012, most farm holdings (67.3%) are located in the coastal area while 32.7% are situated in the interior.

### ***Defining small-scale farmers***

The term “family farming” or small scale farming describes a type of production system that bears the imprint of the structural link between economic activity and family structure. This relationship influences the decision making process, the type of farming, work organization, production management and the handing down of the farm as an inheritance. Small-Scale Farming (SSF) is a type of production system where the farm unit (a single farmer or a couple or a family) is at the same time the owner, the worker and the person who makes the decisions. This means that he enters the decision

process and he plays a central role in a number of choices encompassing breeding and transformation of for example plant and type of grain to sow, type of animal, seasonal pasturelands and related pastoral mobility and selling livestock and the marketing of the final products. Small-Scale Farming (SSF) provides farmers an active role and recognizes their responsibility, linking consumers' demand and environment (VSF Europa, 2012).

In Suriname, the Ministry of Agriculture, Animal Husbandry and Fisheries (MoA) uses the criteria of the Food and Agriculture Organization (FAO) to define a small-scale farmer. If the cultivated area is  $\leq 200 \text{ m}^2$  or  $\leq 0.02 \text{ Ha}$  for annual and semi-annual crops, than the person who cultivates is considered as a farmer (which is known as the small-scale farmer according to other countries in the Caribbean).

### ***Regulations and agricultural policy in Suriname***

The Government national development strategy is outlined in the development plan document, named 'Meerjaren Ontwikkelingsplan' (MOP) of 2012-2016. This document has evaluated the experiences, results and lessons learned in the previous MOP 2006-2011 and has integrated these in the current developing planning. The MOP 2012-2016 uses the United Nations Millennium Development Goals (MDG's) as a guideline for determining, developing and evaluating its development strategies and programs. The Ministry of Agriculture, Animal Husbandry and Fisheries has a facilitating, preparing, directing and monitoring role in policy implementation. The general objective is to guarantee the national food security and nutrition and food safety in such a manner that Suriname is not dependent on the import of vegetables and food products. Other countries like Africa have also adopted the MDGs as a tool within their wider development planning framework, in order to improve the living conditions of their citizens. The United Nations Millennium Development Goals are measurable targets attached to a timeframe for making a difference in the lives of the people (Faboyede *et al.*, 2013). In September 2015, the UN Assembly unanimously approved its new Sustainable Development Goals (Carraro, 2015).

The relative importance of agriculture in Suriname's economy has declined over the last two decades. While agricultural output showed strong fluctuations, the country's economic growth was boosted by development in the mining and services sectors. However, agriculture is still of significant socio-economic relevance, as it is a major provider of employment in rural areas, earns 5% of foreign exchange and is a key contributor to food security through

the production of rice (Derlagen *et al.*, 2013). The purpose of this research was to profile the small-scale vegetable farmers in Suriname.

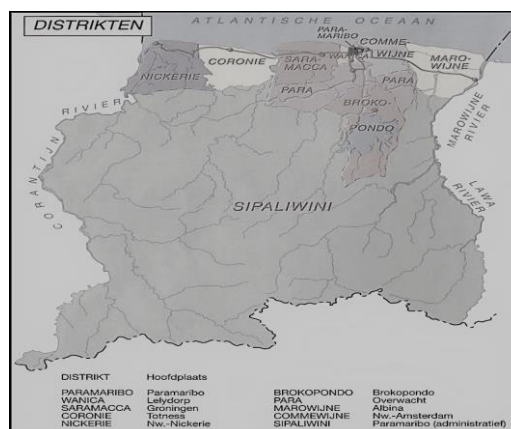
Objectives: To profile the Surinamese small-scale vegetable farmer; to provide an overview (situation and problems) of small-scale farming in three districts and to discuss the factors land, education, marketing, capital and good governance in relation to increased production and export.

## Materials and methods

The focus of this study was on small farmers who are cultivating vegetables for the local and to some extent for the export market. In this study the emphasis was placed on three districts which included Paramaribo, Saramacca and Commewijne where vegetables are mostly cultivated.

This study was conducted to generate and collect data on the current status of small-scale farmers in Suriname (Fig. 2) over the period 2012-2015. Demographic data and statistics about the total cultivated area with different types of vegetables were collected from previous research investigations conducted by Ori *et al.* (2012), Malgie (2013) and from the statistical office “Algemene Bureau voor Statistieken” (ABS, 2013). Additional, data about the cultivated vegetables was collected from interviews in 2014 and 2015 with staff from the MoA.

The study also conducted a review from existing government documentation (especially of MoA) and statistical data from ABS, including the Policy White Paper and Statistics on Agricultural Production. Furthermore, this research made use of published scientific articles on small scale farmers, conference papers on sustainable agriculture and food safety, reports of international organizations and books sustainable agriculture in Suriname.



**Figure 2.** Map of Suriname (Source: ABS, 2006)

## **Results**

### ***Overview of the vegetable sector***

This sector is small (farmers' field range from 0.08-2Ha) and most farmers (70%) are part-timers. According to FAO (2011) the degree of organization among the actors in the sector (producers, wholesalers, traders, exporters) is also low. About 3000 to 4000 farmers (full-time or part-time) are working in the sector (FAO, 2011). Many of them indicated that they are using a huge amount of pesticides to destroy pests and diseases (Malgie *et al.*, 2013). Poor irrigation and drainage practices in times of drought and heavy rain negatively influence seasonal production. This results in price fluctuations. The cultivated area and the total production of vegetables also decreased by respectively 23% and 16% in 2010, compared to the year 2000. The production of vegetables and fruits are mostly produced for the local market and the best quality products are exported to Europe (Netherlands). Approximately 2650 ton vegetables are exported per year (FAO, 2011). In 2004, the institute Practical Research Plant and Environment (PPO) from the Netherlands identified some bottlenecks which can be seen today. Some of the bottlenecks are unevenness in supply caused by lower production in drought and in the period of flooding; low quality of products (flavor, shelf life, packaging, appearance, safety) and poor postharvest handling methods. According to the MoA, the amount of rejected vegetables on the export market in 2007, on the basis of physical damage, was approximately 33% (Capricorn project, 2009).

### ***Demographic description***

Paramaribo has a total of 240.924 inhabitants. About 47.9% of this population are Christians. The main language is Dutch. Commewijne has a total of 31.420 residents. Circa 40% of the population has the Islam as their religion and the main spoken language Dutch (MoA, 2014). In Saramacca there are 17.480 inhabitants, of which 45% are Hindoes and most speak Sarnami (ABS, 2013).

Most (60%) of the small farmers in Suriname are mostly of middle age (40-50 years old). Most of them (90%) are male farmers. They are cultivating for longer than 20 years (Malgie *et al.*, 2013). This indicates that Suriname has an aging population of farmers, who are still using traditional methods to cultivate crops.

More than half of the total of small farmers (70%) are part-time farmers, because the income as a farmer is much too low to survive. They work for the

government in the morning, because they receive secondary benefits like pension funds. Most of the farmers have completed primary school and cultivate primarily with traditional methods (Ori, *et. al*, 2014). The majority of the farmers (70%) are cultivating on land they have rented for agricultural activities (Malgie *et. al*, 2013).

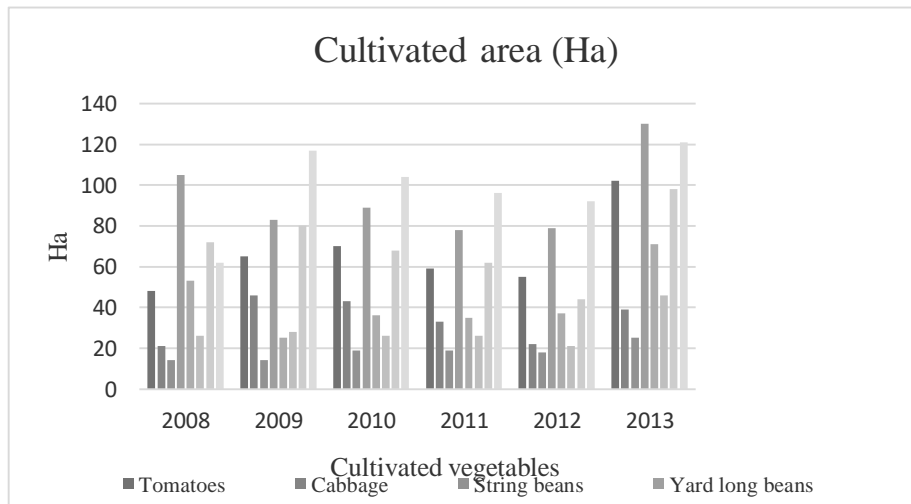
### ***Cultivated area in Suriname***

Table 1 depicts an overview of the vegetables which are cultivated by farmers. The selection was based on the most produced vegetable according to the list of MoA in 2014 of vegetable farmers in Paramaribo, Commewijne and Saramacca.

**Table 1.** Vegetables cultivated by small-scale farmers

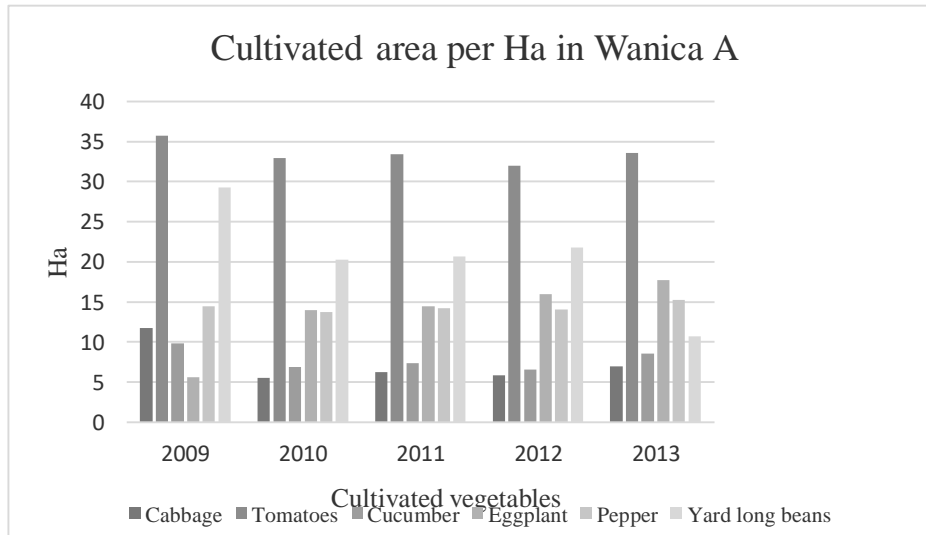
<b>English</b>	<b>Local name</b>	<b><i>Scientific name</i></b>
<b>Tomato</b>	Tomaat	<i>Lycopersicon esculentum</i> Mill.
<b>Cabbage</b>	Kool	<i>Brassica oleracea</i> L. var. <i>capitata</i>
<b>String bean</b>	Bonen	<i>Phaseolus vulgaris</i>
<b>Yard long beans</b>	Kouseband	<i>Vigna sinensis</i> var. <i>sesquipedalis</i> (L.)
<b>Eggplant</b>	Boulangier	<i>Solanum melongena</i> L.
<b>Cucumber</b>	Komkommer	<i>Cucumis sativus</i> L.
<b>Pepper</b>	Peper	<i>Capsicum annum</i> L.
<b>Celery</b>	Soepgroente	<i>Apium grav éolens</i> L.

In 2008 a total of 49.560 Ha was cultivated with different types of crops. Of this total, 28.313 Ha (57.1%) was cultivated by small farmers in Suriname, which increased to 37.754 Ha (76.1%) in 2013 (MoA, 2014). Figure 3 shows the total of planted acreage with different types of vegetables. It should be noted that in 2012 there was a slight decrease of the cultivated area (5.2% in comparison to 2008) but after 2012 there was an increase of 67.9% (MoA, 2014). According to Wongsowikromo in 2015, farmers get better and more production with the use of hybrid seeds on a smaller land area; for example, hybrid seeds of tomato produce approximately 20% more than the Surinamese tomato seeds.



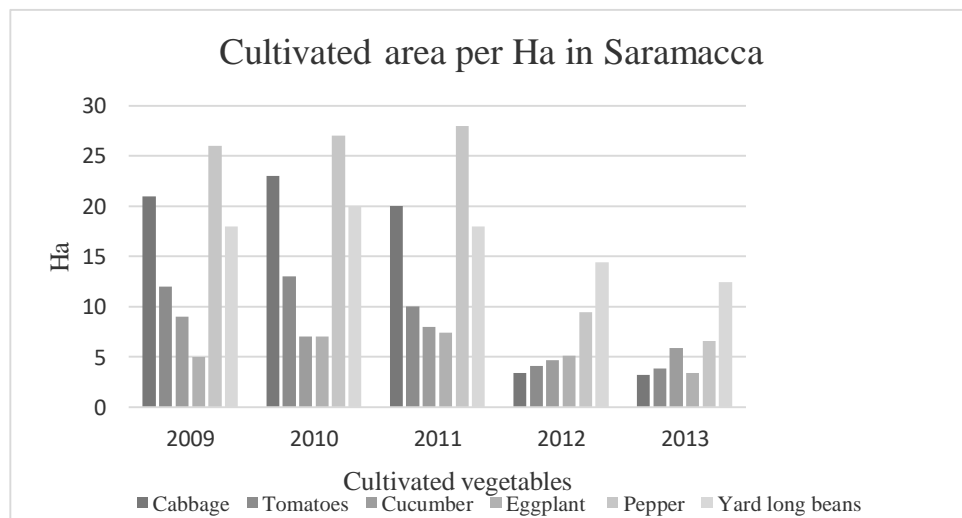
**Figure 3.** Cultivated area from 2008 - 2013 (Source: MoA, 2014 )

With regard to comparing the three vegetable districts, the various results are presented. The cultivated area per Ha from 2009 till 2013 in district Wanica A (Fig. 4) shows a decrease in the cultivated area of yard long beans (from 29.2 Ha to 10.7 Ha), because of heavy rainfall which resulted in low vegetable production. Furthermore, data showed that only the cultivation of eggplant resulted in an increase in production (from 5.6 Ha to 17.7 Ha).



**Figure 4.** Cultivated area per Ha in Wanica A (Source: MoA, 2014)

In Commewijne, there was a large increase in the cultivation of tomatoes from 11.48 Ha in 2009 to 27.3 Ha (237.8%) in 2013 due to the introduction of hybrid seeds. There was also a small increase of cultivated land with regard to cabbage, yard long beans and eggplant in 2013. In Saramacca a dramatically decrease of used land for cultivation was noticed in 2013. Cabbage production dropped to 15.2% and pepper 25.2% in 2013 (Fig. 5) due to disease infestation (Wongsowikromo, 2015).



**Figure 5.** Cultivated area per Ha in Saramacca (Source: MoA, 2014)

### ***Small farmers and education***

GLOBAL Good Agricultural Practices (GLOBALG.A.P.) is a private sector body that has established voluntary standards for the certification of production processes of agricultural (including aquaculture) products around the globe. The GLOBALG.A.P. standard is in the first place designed to reassure consumers about how food is produced on the farm by minimizing detrimental environmental impacts of farming operations, reducing the use of chemical inputs and ensuring a responsible approach to worker health and safety as well as animal welfare (Kenswiel, 2015).

The Ministry of Agriculture, Animal Husbandry and Fisheries is using the GLOBALG.A.P. requirements as a guideline in order to guide and protect farmers and consumers from pesticides. Since 2004, the MoA has been engaged in GLOBALG.A.P. training (Ori, *et. al*, 2012). All registered farmers at the ministry received a mini-book in which farmers have to register their crop production data. In order to meet the G.A.P. requirements, the farmer must use



Personal Protective Equipment (PPE); adhere to the prescribed and permitted pesticides as described in the Pesticides law of Suriname and make use of the environment in a sustainable way. For this, MoA provides customized training, education and awareness in GLOBALG.A.P., Integrated Pest Management (IPM), Integrated Crop Management (ICM), Post-harvest and greenhouse management. This implies that the farmers who received the information are aware of the effects of misuse of pesticides, whereby the farmers are producing better and safer food (Kenswiel, 2015).

One of the problems which occurs is that although the MoA provides information sessions on food safety for farmers, not all farmers have access to the information. Most of the information sessions take place at the time when full-time farmers are working on their farm. This is the reason why those farmers cannot attend the information sessions. Furthermore, the locations where the sessions are taking place are not always central from where the farmers are living. The distance is often too far for farmers, which makes it expensive for them to commute (Kenswiel, 2015).

### ***Small farmers and marketing***

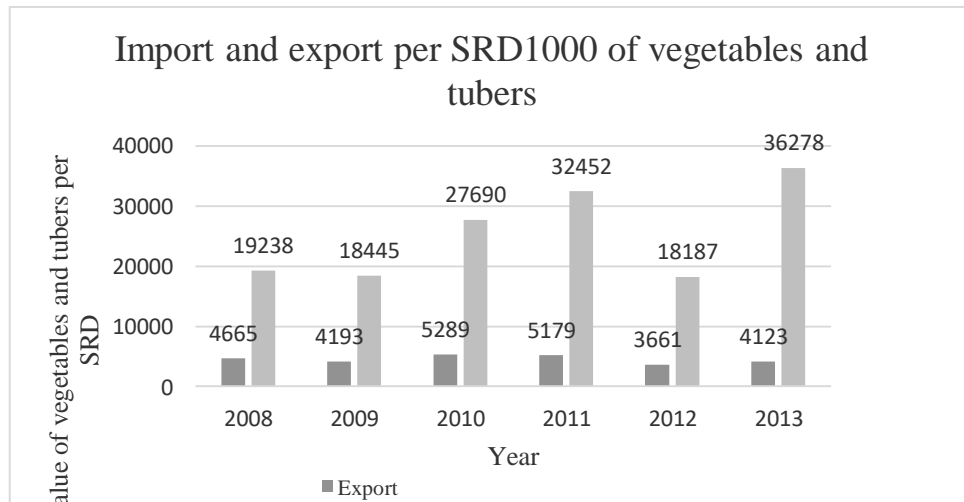
The marketing structure is the same as it was thirty years ago in Suriname. Farmers were and are still forced to sell their vegetables to a middle-man for a minimum price, because they do not have the time to sell their production on the market and because of the fact that they do not have any guarantee that the whole production will be sold. The middle-man sells it further on the market for almost twice the price; making thus much more profit than the farmer. Moreover, in the past there was only one local market, named the Central Market, located in Paramaribo, where farmers and middle-men could sell vegetables. Nowadays, there are more markets available in Suriname, including the Sunday market. In general, the markets are open on Wednesday and Friday, whereby some farmers have the opportunity to sell their produce straight to the clients.

According to Dwarka D., a policy maker at MoA, farmers were also better organized in cooperatives in the past. The Netherlands was the biggest market for export, because of the colonial relationship with Suriname (diaspora). Surinamese descendants also prefer vegetables cultivated in Suriname, and thus the demand for vegetables cultivated in Suriname was great. Agreements with farmers were made about the quantity of vegetables they had to deliver on a weekly basis for export. Despite the fluctuations in price and seasonal weather, a standard price was guaranteed for farmers for the whole year (e.g. 10.000 kg pepper à €4 per kg). This enabled farmers to improve their

quality of life. In this way, quality, quantity and continuity of vegetable production were maintained. These days, cooperation among farmers is difficult. Only in times of need and when there is economic advantage they are willing to collaborate.

### *Small farmers and capital*

Depending on the season (rainy or dry season), the prices of vegetables fluctuates from very high to quite affordable, influencing the import and export. Figure 6 provides a clear picture of the income and expenses. Suriname spends more currency on the import of vegetables and tubers (\*SRD36.278 per SRD1000/ \$11.162,46 per \$1000) than it generates more income with the export (\*SRD4.123 per SRD1000/ \$1.268.61 per \$1000 in 2013) of these commodities. Furthermore, farmers indicated that they purchase their pesticides, seeds, water pumps and that farm equipment and tools are not (always) shared with other farmers. But by working together, farmers get more than just a solution to a similar problem; they also get solidarity. This problem is also seen in Jordan, where 97.9% indicated that they do not share with other farmers (Al-Oun, 2012).



**Figure 6.** Import and export value of vegetables and tubers per ton (Source: MoA, 2014) \*NOTE: exchange rate of \$1=SRD3.35

### *Small farmers and good governance*

Dasgupta *et al.*, (2011) defines agricultural governance as a concern with augmentation of growth and development of a country's agriculture sector and managing the consequences of this process through effective functioning of its

institutions, application of technology and scientific innovations, implementation of policies, adherence to acts and regulations and active participation of all involved stakeholders. Agricultural governance in many countries is organized in a ministry or department responsible for the food and agricultural production sector as a whole. In Suriname there are separate ministries or departments that are responsible for subsectors other than crops, for instance fisheries, forestry and livestock. Suriname has the expertise (competence and skills) but the needed tools are missing for instance authorization of MoA to sanction farmers who do not produce safe food or the absence of an operational laboratory in Suriname to test vegetables on pesticides which are required to produce sustainable before selling it to local or international markets. For example, it is important that the needed tools are available to compete with the international market on a bigger scale. For this, more knowledge and knowhow is needed than the traditional methods, transferred by farming generations with many years of field experience.

The internet can be used to search for new agricultural methods, information on pests or usage of new pesticides. According to Dinesh Mohan (2016), who conducted a research study on the impact of the launch of an application (ICT) which would provide sustainable agriculture information for farmers in Suriname, 82.9% of the respondents were interested in using this application. Using an app application would support farmers in improving their attitude and awareness towards the appropriate use of pesticides. But in Suriname, not all farmers have internet at their home or do not have time to access the internet or do not even know how to use the internet. Therefore, it is important that the government provides a key role with the diffusion of relevant information to farmers through the Extension Service which is situated within MoA in Suriname.

The Ministry of Agriculture, Animal Husbandry and Fisheries introduced the use of greenhouse cultivation but that doesn't solve the problems in the field. The problem begins at the production of vegetables for local markets. When there is a surplus of vegetables, the price decreases and farmers cannot make any profit. The MoA must guide farmers by providing information and the needed tools so that the farmers can increase knowledge and skills in order to produce food in a sustainable manner and in sufficient amount for the local market. Nowadays is noted that the MoA provides more information and training about the use of pesticides. The introduction of hybrid vegetable seeds has also resulted in increased vegetable production for farmers but still laws and legislation needs to be in place to guarantee quality, quantity and continuity of production (Dwarka, 2016).

## **Discussion**

Currently, vegetable farmers in Suriname are aging. The youth is not interested to work in the agricultural sector, because they are not willing to do all the hard work to earn a living. Instead, they prefer office work. This is also seen in other countries, for example Nigeria where the largest proportion of the population involved in agriculture faces a great challenge since most of the youth do not intend to get involved in agriculture. This makes it almost impossible for farmers in Nigeria and most developing nations to retire from active agricultural service and thus calls for an inquiry into the effects of ageing of their agricultural activities as it has implications for rural-urban migration and disenchantment of the younger generations from farming (Fasina, 2013).

To guarantee the safety of the food produced by farmers it is also important that they have knowledge, skills and information which is needed to produce safe and good quality food. In lieu of this, in 2014 Jamaica designed a device and application, also known as ‘Node 420’, which show new production methods in the agriculture and which enable the farmer to sow, cultivate and harvest efficiently on the basis of ‘up-to-date’ information to improve sustainable production.

An important aspect for successful production is a good organized marketing strategy. But nowadays, cooperation among farmers is difficult, whereby they have to sell the crops for a minimum price to a middle-man to be guaranteed that the whole production is sold. According to Al-Oun (2012) the Jordanian food market is considered to be one of the fastest growing markets in the region (Parker, 2006). Traditional market systems in Jordan are replaced by new mechanisms that endanger small and medium producers. New trends are implemented through new market infrastructures, technology and telecommunications. Where access to markets is poor, off-farm work becomes critical for sustaining rural livelihoods (Wiggins, 2000). Meanwhile, further research is being conducted in order to develop the agricultural sector in a sustainable manner and to provide the needed information which should reach the farmer easily.

Although it is the responsibility of MoA to ensure that farmers are producing safe food, MoA cannot guarantee this until laws and regulations are in place and operational. Policy and regulations needs to be improved and the import of bio-pesticides needs to be stimulated to reduce potential risks on human health and negative impacts on the environment, caused by the use of chemicals. This is very crucial to ensure good quality and sustainable vegetable production in the agricultural sector. Knowledge transfer on sustainable techniques, including the introduction of Integrated Pest Management (IPM)

and the use of hybrid seeds, are also very important to transform traditional farmers into sustainable 'experts' by creating an attitude and behavior change to produce more and healthy products for the local market. To realize this, important steps (like institutional strengthening of MoA and the adjustment of laws and regulations on the use of pesticides) should be taken first before Suriname can become the potential 'food basket' for the region by 2035. Research on the livelihood and the current social, economic and political problems farmers are dealing with are very crucial to get a better understanding on how farmers are cultivating and how to transfer knowledge to provide the needed tools to farmers to produce sustainable.

## **Conclusion**

Based on the results, it can be concluded that the majority (60%) of the Surinamese small-scale vegetable farmers are older than 40 years. Furthermore, it can also be concluded that most of them have completed primary school and do not have many skills (for example skills on how to communicate and work together as a team or cooperation). Although there are a few farmers who are younger and better educated than the majority of farmers, they are still using traditional vegetable production methods transferred by their parents/grandparents. For this purpose, improved innovative research, extension and training capacity is needed to produce more sustainable.

Besides the fact that not all small-scale farmers are producing sustainable or according to the principles for producing safe and healthy food, food safety cannot be guaranteed because until now no residue laboratory, residue laws and regulations are operational. Another problem is that small-scale farming in Suriname is 'sensitive', because of the strong seasonal production, which results in price fluctuations. This is due to poor infrastructure and drainage in times of drought and heavy rain. It is important that cooperatives are established where capital can be build up for farm investment.

Looking at the factor land it can be concluded that over the past years farmers had better production in less cultivated areas. The farmer educates himself with knowledge/ skills, received from trainings of MoA. With regard to good governance, it can be concluded that the government (MoA) provides training to make the farmers aware of food safety and is introducing technologies such as (hybrid) seeds which results in higher production. However, still the laws and legislation needs to be in place to guarantee quality, quantity, nutritious and safe food and continuity of production. The introduction of labor saving agricultural techniques would be an option in order to increase production and produce more sustainably.

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