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of the United Nations

2014 Census of Agriculture

TCP/MAR/3403 – Support to Census of Agriculture

Land Analysis Report

By

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TECHNICAL NOTES

(1) Symbols

ha Hectare

- Nil

... Negligible

(2) Conversion Factors

1 acre = 0.004046859 km²

1 acre = 0.4046863 hectare

1 hectare = 0.01 km²

1 hectare = 10,000 m²

1 hectare = 236.922 perches

1 perche = 42.2087 m²

ACRONYMS

CA2014	2014 Census of Agriculture
FAREI	Food and Agricultural Research and Extension Institute
FAO	Food and Agriculture Organization of the United Nations
IOM	Island of Mauritius
IOR	Island of Rodrigues
MAIFS	Ministry of Agro Industry and Food Security
MCIA	Mauritius Cane Industry Authority
ROM	Republic of Mauritius
SM	Statistics Mauritius
WCA2010	World Programme for Census of Agriculture 2010

EXECUTIVE SUMMARY

The FAO recommends that every country should conduct Agricultural Censuses every 10 years. In this context, an Agricultural Census was carried out in Mauritius in 2014 by Statistics Mauritius with the collaboration of FAO and MAIFS. For this purpose, the guidelines of the *World Programme for the Census of Agriculture 2010* published by the FAO were followed. Several important aspects related to agriculture that were covered during the Census included number of farmers, characteristics of households, farm activities, land use, land tenure, type of crops grown, livestock reared and marketing aspects. The purpose of this report is to present the results and analysis of data collected in relation to the land use and land tenure sections of the Census. Two summaries of past Censuses made some 70 years ago have also been included in this report for comparison purposes.

Land use and land tenure were among the major components forming part of the Census. Data were collected for nine basic land use classes which included land under temporary crops, land under temporary meadows and pastures, land fallow, land under permanent crops, land under permanent meadows and pastures, forest or wooded land, land suitable for agriculture but not used, built up areas (buildings, parks, roads, etc.) and other land (e.g. wasteland, land under water, etc.). The land tenure types included in the census were land owned, land leased from Government, land rented/leased from others and other types of land tenure.

The results of the data collected are presented and analysed. The amount of agricultural land area recorded by the present census, including areas under sugarcane and tea, in the Island of Mauritius, works out to approximately 83,000 ha compared to a figure of 74,000 ha of the 1940 census. This represents an increase of 12% in available agricultural land from the last two censuses.

In the Island of Mauritius, more than three quarter of available agricultural land were utilised for the cultivation of temporary crops and permanent crops. Around 9% of available agricultural land fell under the category of fallow land, land suitable for agriculture and other land uses can be exploited for cultivation after careful assessment.

In the Island of Rodrigues, around three quarter of available agricultural land on the island was under food crop production. Some 11% of available agricultural land falls under the category of fallow land, land suitable for agriculture and other land uses and could be exploited.

It has also been found that some range of small land sizes were most preferred by farmers in the Islands of Mauritius and Rodrigues. A large percentage of the total agricultural land area rented to others in Mauritius was owned by businesses while the opposite was true for Rodrigues where all land rented to others belonged to household farmers. More than 45% of agricultural lands in Rodrigues were occupied by farmers awaiting for permits.

A land fragmentation analysis could not be carried out as relevant data would not be appropriate in a census but rather in a specific survey. Sections related to dispersion of parcels, shape of parcels, accessibility of parcels, dual ownership and shared ownership could be included in future surveys to cater for a land fragmentation analysis.

1 INTRODUCTION

A census of agriculture consists of the statistical operations for collecting, processing and disseminating data on the structure of agriculture. Usually the whole country is covered, however, under certain circumstances only a significant part of it may be covered.

The Food and Agriculture Organisation (FAO) of the United Nations recommends that every country should conduct Agricultural Censuses every 10 years. In this context, the present Agricultural Census was carried out in Mauritius in 2014 by Statistics Mauritius with the collaboration of FAO and the Ministry of Agro Industry and Food Security.

The World Programme for the Census of Agriculture 2010 guidelines published by the FAO was followed. Several important aspects related to agriculture were covered including number of farmers, characteristics of households, farm activities, land use, land tenure, type of crops grown, livestock reared and marketing aspects. The purpose of this report is to present the results and analysis of data collected in relation to the land use section of the Census.

Reference was made to available data comprising two past Agricultural Censuses carried out in 1930 and 1940. Summaries of the findings of these Agricultural Censuses have also been included in this report for comparison purposes.

Land use and land tenure were among the major components forming part of the Census. Data were collected for nine basic land use classes which included land under temporary crops, land under temporary meadows and pastures, land fallow, land under permanent crops, land under permanent meadows and pastures, forest or wooded land, land suitable for agriculture but not used, built up areas (buildings, parks, roads, etc.) and other land (e.g. wasteland, land under water, etc.).

The land tenure types included in the census were land owned, land leased from government, land rented/leased from others and other types of land tenure. More detailed explanations on land use classification and land tenure types recommended by FAO are given in the next section.

The Census data collected were provided by Statistics Mauritius and are presented in this report. The conclusions and recommendations drawn are based on analysis of these provided data.

1.1 LAND USE TYPES

The seven land use types should be grouped in a suitable way to present agricultural census results. The WCA2010 recommends the land use classification shown in Table 1.

Table 1: Classification of land use

I	II	III	IV
Agricultural land	Cropland	Arable Land	Land under temporary crops
			Land under temporary meadows
		Land temporarily fallow	
	Land under permanent crops		
	Permanent meadows and pastures		
Forest or other wooded land			
Other land			

Source: World Programme for the Census of Agriculture 2010, FAO

The following definitions of the seven basic land use types have been extracted from the WCA2010 guidelines.

1. ***Land under temporary crops*** includes all land used for crops with a less than one year growing cycle; that is, they must be newly sown or planted for further production after the harvest. Some crops that remain in the field for more than one year may also be considered as temporary crops.
2. ***Land under temporary meadows and pastures*** include land temporarily cultivated with herbaceous forage crops for mowing or pasture. A period of less than five years is used to differentiate between temporary and permanent meadows.
3. ***Land temporarily fallow*** is arable land at prolonged rest before re-cultivation. This may be part of the holding's crop rotation system or because the normal crop cannot be planted because of flood damage, lack of water, unavailability of inputs, or other reasons.
4. ***Land under permanent crops*** refers to: land cultivated with long-term crops which do not have to be replanted for several years; land under trees and shrubs producing flowers, such as roses and jasmine; and nurseries (except those for forest trees, which should be classified under "forest or other wooded land"). Permanent meadows and pastures are excluded from land under permanent crops.

5. ***Permanent meadows and pastures*** include land used permanently (for five years or more) to grow herbaceous forage crops, through cultivation or naturally (wild prairie or grazing land).
6. ***Forest and other wooded land*** is land not classified as mainly “agricultural land” that satisfies either of the following definitions:
- a) ***Forest land*** is land with crown cover of more than 10 per cent of trees able to reach a mature height of 5 metres or more. It includes natural and plantation forests. Areas that are temporarily not under trees but are expected to revert to forest should be included. Forest tree nurseries that form an integral part of the forest should be also included.
 - b) ***Other wooded land*** is land with:
 - (i) crown cover of 5–10% for trees able to reach a height of 5 metres or more at maturity; or
 - (ii) crown cover of more than 10% for trees not able to reach a height of 5 metres at maturity; or (iii) shrub or bush cover of more than 10%.
7. ***Other land*** includes all other land on the holding, not elsewhere classified. It includes uncultivated land producing some kind of utilizable vegetable product, such as reeds or rushes for matting and bedding for livestock, wild berries, or plants and fruit. It also includes land which could be brought into crop production with little more effort in addition to that required in common cultivation practices. Also included under this category is: land used for aquaculture; land occupied by buildings; parks and ornamental gardens; roads or lanes; open spaces needed for storing equipment and products; wasteland; land under water; and any other land not reported under previous classes.

According to FAO’s recommended land use classification shown in Table 1 above,

- (i) ***Arable land*** is land that is used in most years for growing temporary crops. Arable includes land used for growing temporary crops in a twelve month reference period, as well as land that would normally be so used but is lying fallow or has not been sown due to unforeseen circumstances. Land under permanent crops or land that is potentially cultivable but is not normally cultivated does not fall under arable land classification.
- (ii) ***Cropland*** is the total of arable land and land under permanent crops.
- (iii) ***Agricultural land*** is the total of cropland and permanent meadows and pastures.

1.2 LAND TENURE TYPES

According to FAO guidelines, land tenure refers to the arrangements or rights under which the holder operates the land making up the holding.

Land tenure types includes

- Legal ownership or legal owner-like possession
- Non-legal ownership or non-legal owner-like possession
- Rented from someone else

More details on the above land tenure types extracted from the FAO guidelines are given below:

(i) Legal ownership or legal owner-like possession describes land rights that provide statutory security of tenure. The ownership must be recognized by the state, and administrative structures must be in place to ensure that property rights are enforceable.

(ii) Non-legal ownership or non-legal owner-like possession describes a variety of informal land tenure arrangements, which do not provide security of tenure, and where circumstances could arise where the holder may be dispossessed of the land.

(iii) Rented land from someone else means land that is rented or leased by the holding from other persons, usually for a limited time period. Rental arrangements can take different forms. Land may be rented for an agreed sum of money and/or produce, for a share of the produce, or in exchange for services. Land may also be granted rent free.

(iv) Other types of land tenure, e.g. land operated on a squatter basis; that is private or public land operated without ownership title and without the owner's consent. Other land tenure types include: land operated under transitory tenure forms, such as trusteeship; land received by members of collective holdings for individual use; and land under inheritance proceedings.

1.3 AIMS AND OBJECTIVES OF CA2014

The main objectives of CA2014 were:

- (a) To provide important information on the organisational structure of farms at geographic level for better and informed decision making (e.g. farm size, land use, land tenure, crop area harvested, presence of irrigation, livestock numbers, farm labour as well as the number of holdings with each crop and livestock type);
- (b) To improve estimates on the contribution of agriculture for the economy;
- (c) To provide information on the household sector including subsistence farming which is important for food security; and
- (d) To improve the completeness of existing sampling frame that will be used as the base of sample selection for future agricultural surveys.

1.4 TERMS OF REFERENCE OF NATIONAL CONSULTANT – LAND ANALYSIS

Under the overall supervision of the FAO Representative in Madagascar, Comoros, Mauritius and Seychelles, the lead consultant, Mr. A. D. Marshall and the technical guidance of the Regional Statistician, FAO Regional Office for Africa (FAORAF), the appointed National Consultant for land analysis was given the task to carry out an in-depth analysis of the CA2014 data with the following terms of reference:

- Review the data collected in the census requesting additional tabulations, as required
- Draft a paper analysing the census data in the context of the agricultural sector and in the light of other data sources – maximum 15 pages including an executive summary.
- Present the paper at the data dissemination workshop
- Prepare a short end-of- assignment report
- Carry out any other assignment that FAO may ask him.

2 AVAILABLE AGRICULTURAL DATA FOR REPUBLIC OF MAURITIUS

2.1 LAND AREA - REPUBLIC OF MAURITIUS

2.1.1 Area of Republic of Mauritius

The Republic of Mauritius comprises of two main islands, Mauritius and Rodrigues as well as other outer islands and the total land area is around 204,000 hectares.

2.1.2 Area of Island of Mauritius by District

The Island of Mauritius has a total land area of 185,753 hectares. It is divided into nine districts and their corresponding areas are presented in Table 2.

Table 2: Extent by district, IOM

(Hectares)

Port Louis	Pamplemousses	Riviere du Rempart	Flacq	Grand Port	Savanne	Plaine Wilhems	Moka	Black River	All districts
4,036	17,963	14,668	29,731	26,072	24,622	19,618	23,444	25,599	185,753

Source: Ministry of Housing & Lands

2.1.3 Area of Island of Rodrigues by Region

Rodrigues is divided into six regions and their respective areas are shown in Table 3.

Table 3: Extent by Region, IOR

(Hectares)

La Ferme	Maréchal	St. Gabriel	Baie Aux Huîtres	Port Mathurin	Grande Montagne	All regions
2,914	1,467	1,523	1,164	1,244	2,524	10,836

Source: Ministry of Housing & Lands

2.2 PAST AGRICULTURAL CENSUSES

From available records, two censuses were carried out in the Island of Mauritius, the first in 1930 and the last one in 1940. The main findings of these two censuses are highlighted below.

2.2.1 Main findings of the 1930 Agricultural Census

- (i) Total areas of all district equalled to 185,459 hectares (458,278 acres).
- (ii) Total land area under sugar cane was 55,516 hectares (137,182 acres).
- (iii) Total land under non-sugar crops was 12,494 hectares (30,873 acres).
- (iv) Total area under Forests including Pas Geometriques, Mountain Reserves and River Reserves was 38,324 hectares (94,701 acres).

2.2.2 Main findings of the 1940 Agricultural Census

- (i) Total areas of mainland districts equalled to 185,459 hectares (458,278 acres).
- (ii) Total land area under sugar cane was 61,045 hectares (150,845 acres).
- (iii) Total land under non-sugar crops was 12,625 hectares (31,196 acres).
- (iv) Total area under Forests including Pas Geometriques, Mountain Reserves and River Reserves was 32,672 hectares (80,733 acres).

2.2.3 Summary of changes between 1930 and 1940 Censuses

The summary of the changes that occurred between 1930 and 1940 based on the respective Agricultural Censuses are shown in Table 4 and illustrated below

- (i) Land area under sugar cane plantation increased by 10%.
- (ii) There was a marginal increase of 1% regarding the area of land under non-sugar crops.
- (iii) The Mountain Reserves areas decreased only infinitesimally during that decade.
- (iv) Total area under Forests showed a significant decrease of 15%. Assuming that Pas Geometriques, Mountain Reserves and River Reserves are established and fixed areas, it can be deduced that around 5,650 hectares of Forest Reserves were cleared gradually over 10 years starting 1930. This figure almost tallies with the increase (+5,660 hectares) in area under sugar cane and non-sugar cane crops over the same period (Table 4).

Table 4: Comparison of land use data between 1930 and 1940 Censuses

(Hectares)

Land Use	1930	1940	% Change
Total area of all districts	185,459	185,459	0
Total land area under sugar cane	55,516	61,045	+10
Total land under non-sugar crops	12,494	12,625	+1
Total area under Forests incl. Reserves	38,324	32,672	-15

2.3 TREND IN AGRICULTURAL LANDS – ISLAND OF MAURITIUS (1986-2013)

Data on the extent of land devoted for agricultural purposes between 1986 and 2013 were compiled from various documents published by the Government of Mauritius and summarised in Table 5. It shows that the total area of agricultural land decreased by about 30% over three decades.

Table 5: Land Use, 1986 -2013, IOM

	1986 ¹	1996 ¹	2005 ²	2008 ³	2010 ⁴	2011 ⁴	2012 ⁴	2013 ⁴
Agricultural lands (ha)	91,574	84,424	80,674	72,933	70,581	68,081	66,126	65,254

Sources:

¹National Parks and Conservation Service

²Second National Communication of the Republic of Mauritius under the United Nations Framework Convention on Climate Change (UNFCCC), Republic of Mauritius, Mauritius Meteorological Services, November 2010.

³Statistics Mauritius (Digest of Agricultural Statistics 2011)

⁴Fifth National Report on the Convention on Biological Diversity, Republic of Mauritius, April 2015

2.4 MAJOR LAND USE - ISLAND OF MAURITIUS

The following land use statistics were available prior to CA2014:

- (i) In 2005, agriculture and forests (including green spaces) occupied around 43% and 25% of the available land respectively.
- (ii) In 2008, there were some 14,854 ha of land protected areas comprising the Black River Gorges National Park (6,574 ha or 44%), the mountain reserves (3,800 ha or 26%) and river reserves (2,740 ha or 18%).
- (iii) Between 1999 and 2008, forests decreased from 34,540 ha to 25,000 ha.
- (iv) Within 10 years from 1995, share of agricultural land dropped from 48% to 46%, that of forestry from 31% to 25% while that of built-up areas increased from 13% to 19%. This was mainly due to urbanisation and the development of industries and infrastructure.

3 THE 2014 CENSUS OF AGRICULTURE (CA2014)

3.1 THE 2014 CENSUS OF AGRICULTURE

The CA2014 was conducted after more than 70 years with the last one being conducted in 1940.

Statistics Mauritius conducted CA2014 jointly with the Ministry of Agro Industry and Food Security in the islands of Mauritius and Rodrigues from July to December 2014. A steering committee on the CA2014 was constituted and met several times to monitor progress of work of the data collection process.

The census covered agricultural businesses and farms and private households engaged in agricultural activities. It was carried out in three phases:

- (a) Phase I: A census (100% enumeration) of all agricultural businesses (113)
- (b) Phase II: A sample survey of 10,339 agricultural farms
- (c) Phase III: A sample survey of 8,778 private households

3.2 LAND USE

In this agricultural census, the area of the holding was classified according to its main land use. For the purposes of this agricultural census, nine basic land use types were identified as follows:

- ✓ Land under temporary crops
- ✓ Land under temporary meadows and pastures
- ✓ Land fallow
- ✓ Land under permanent crops
- ✓ Land under permanent meadows and pastures
- ✓ Forest or wooded land
- ✓ Suitable for agriculture but not used
- ✓ Built up areas (buildings, parks, roads, etc.)
- ✓ Other land (e.g wasteland, land under water, etc)

For presenting agricultural census results, these nine land use types were grouped in a suitable way according to FAO guidelines.

4 ANALYSIS OF CENSUS RESULTS

4.1 LAND USE - ISLAND OF MAURITIUS

4.1.1 Land Use of all farms

Figure 1 shows that a total of 76% of currently available land for agricultural purposes is being utilised for the cultivation of temporary crops (short cycle crops with less than one year growing cycle) and permanent crops (long-term crops which do not have to be replanted for several years). A total of 7% of agricultural land is comprised of fallow land and unutilised suitable agricultural land. The remaining land areas falls under the remaining basic land use types.

Concerning main land use types, arable land account for 15%, while cropland represent 78%. Agricultural land comprise of 82% of available land for agricultural purposes. The remaining 6% consist of other land use type shared between land suitable for agriculture, built-up areas, wasteland, etc.

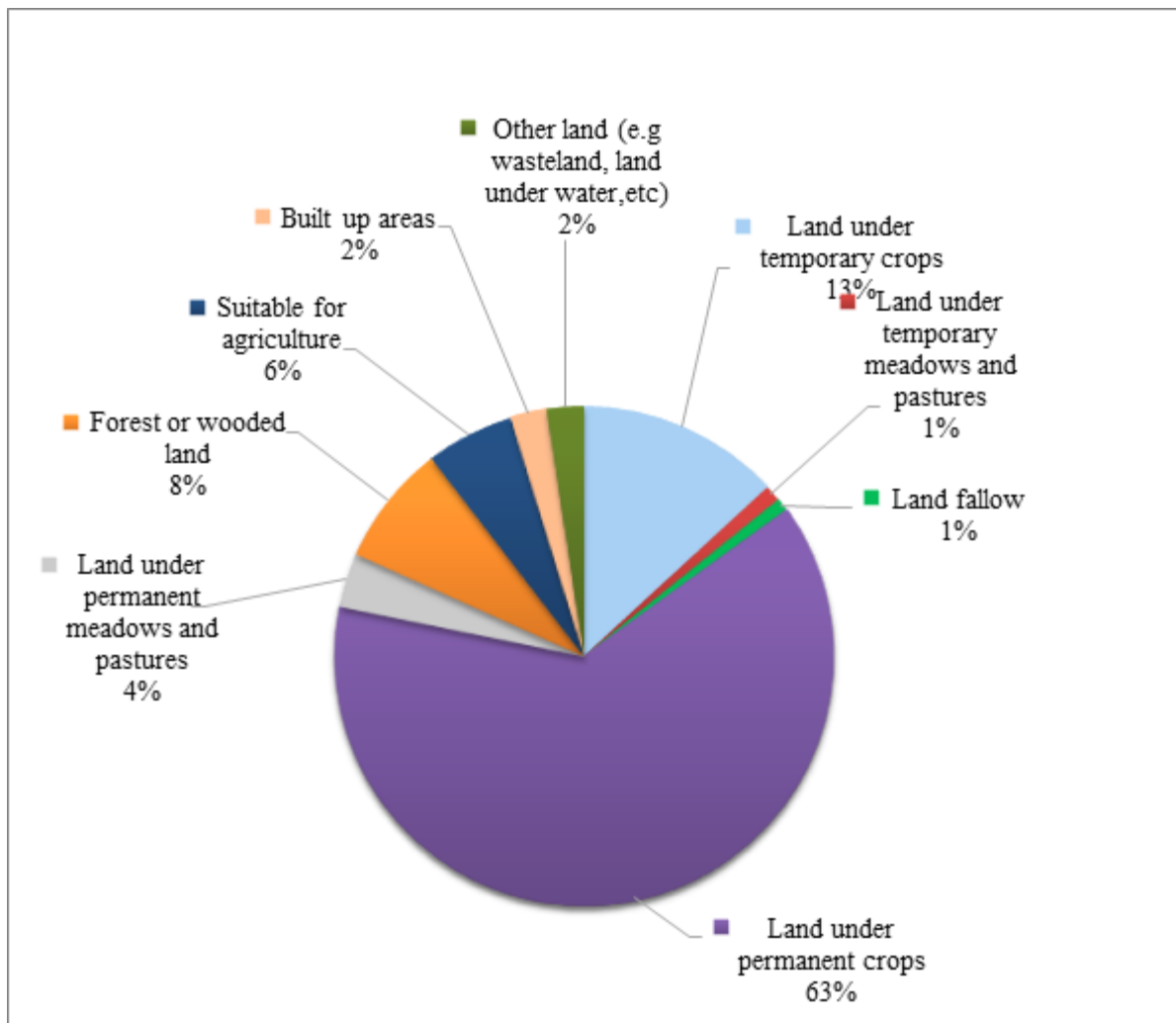


Figure 1: Percentage distribution of land by basic land use type (All farms), July 2013 – June 2014, IOM

4.1.2 Land Use of household farms

Figure 2 indicates that the household farms in Mauritius utilised more than 90% of their aggregated land area for the cultivation of temporary crops (short cycle crops with less than one year growing cycle), temporary meadows and pastures, permanent crops (long-term crops which do not have to be replanted for several years) and permanent meadows and pastures. In other words, they occupied their available land under all of the basic land use types with the peak extent of land (51%) dedicated to the cultivation of temporary crops alone.

Forest land represented only 1% while a negligible 0.3% was allocated to infrastructures (appearing as 0% for built-up area). A total of 4% comprised of fallow land and unutilised suitable agricultural land. The remaining land areas fell under other basic land use type.

Concerning main land use types, arable land areas aggregated to 54%, while cropland represented 89%. Agricultural land comprised 94% of available land for agricultural purposes. Forests occupied approximately 1% of total land areas and around 5% consisted of other land class shared between land suitable for agriculture, built-up areas, wasteland, etc.

More details on land use for household sector are found at Table 9 of Appendix 1.

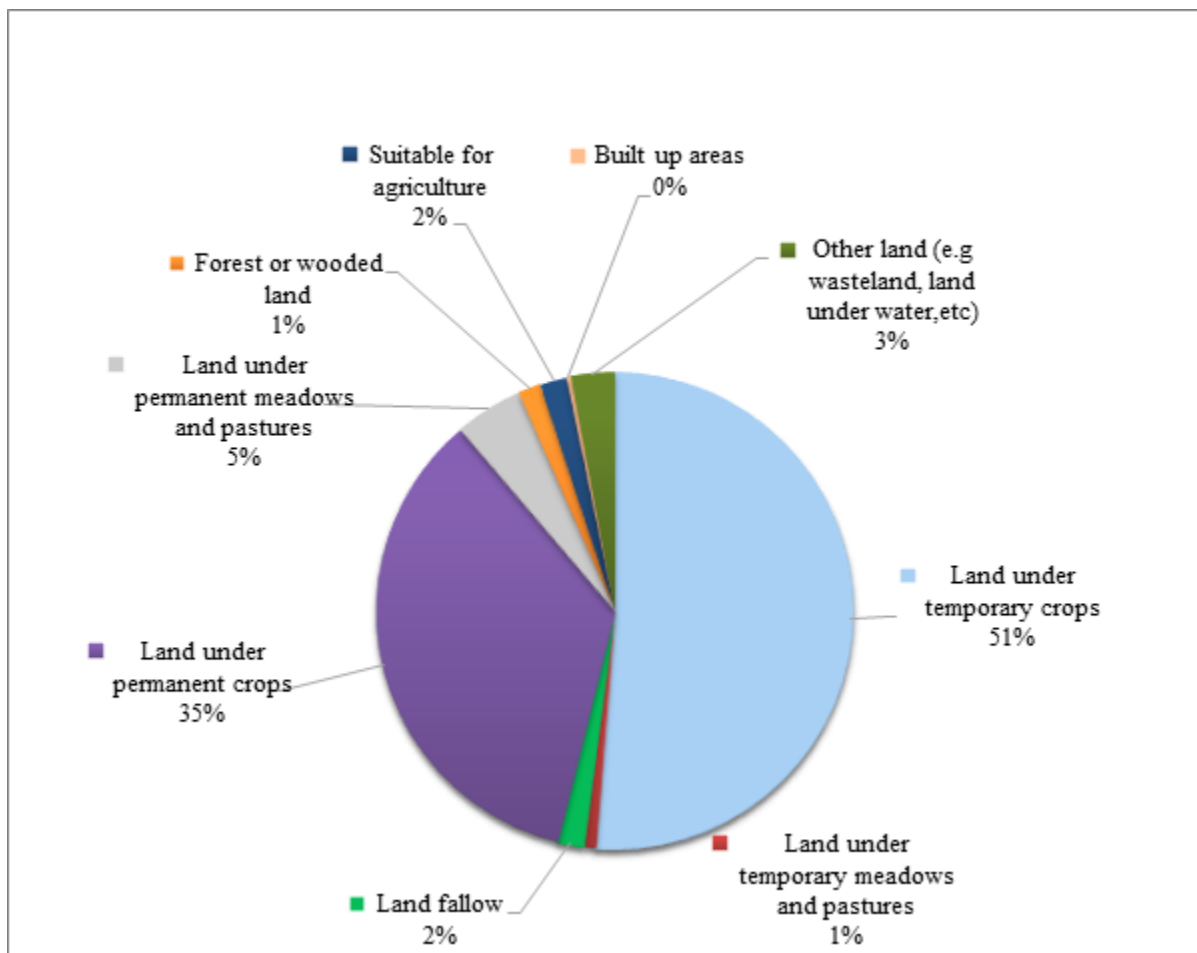


Figure 2: Percentage distribution of land by basic land use type (Household farms), July 2013 – June 2014, IOM

4.1.3 Land Use of non-household farms

According to Figure 3, non-household farms in Mauritius occupied more than two thirds of their total land area for the cultivation of permanent crops. Only 6% of their lands area were under temporary crops and temporary meadows and pastures, while 1% were kept temporarily fallow. Permanent meadows and pastures represented 3% and a significant 9% were kept as forest land. 3% of their lands were allocated to infrastructures while a considerable 7% which is suitable for agriculture were unutilised. The remaining 2% falls under other land basic land use class.

Concerning main land use types, Arable land areas summed to 7%, while Cropland represented 76%. Agricultural land comprised 79% of available land for agricultural purposes. Forest class occupied approximately 9% of total land areas while around 2% fell under the other land use type.

More details on land use for non-household sector are found at Table 9 of Appendix 1.

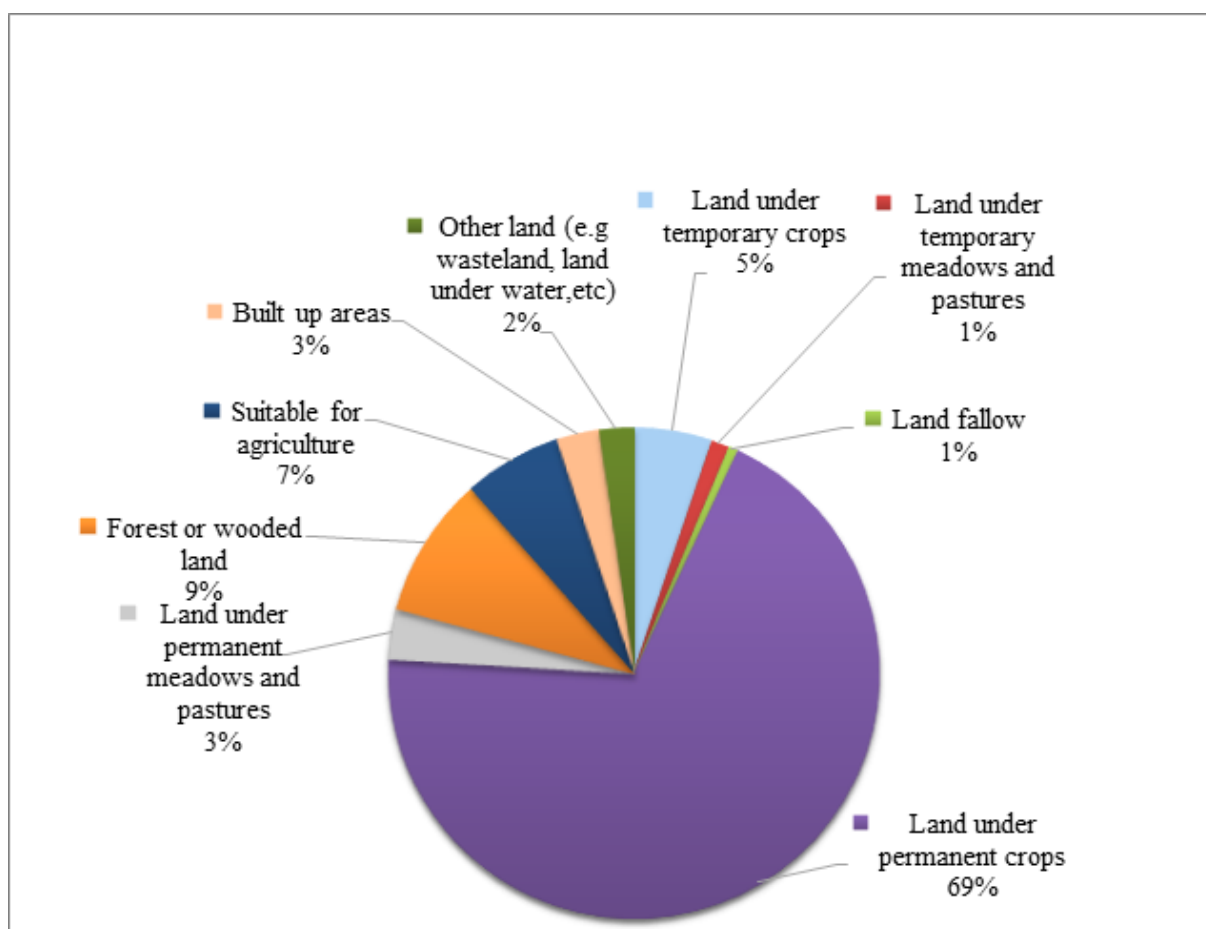


Figure 3: Percentage distribution of land by basic land use type (Non-household farms, July 2013 – June 2014, IOM)

4.1.4 Comparison of land use of household and non-household farms by basic land use type

In comparing Figures 2 and 3 above, it is observed that agricultural businesses cultivated permanent crops on approximately 70% of their total available land compared to household farms which occupied around 35% of their land for the same activity. More than 50% of land available to household farms was under temporary crops compared to 5% for businesses. Out of their total extent, some 10% of land comprising of forests were managed by businesses, while household farmers occupied only 1.5% of their available land as forest.

In general, businesses occupied almost five times more land areas than household farms. However, when comparing respective extent of land exploited under each basic land use class, it was observed that businesses occupied more land than household farms in each basic class with the exception for the growing of temporary crops. In fact, household farms exploited twice as much land areas as did non-household farms for growing short-cycle (temporary) crops. Some 36,860 hectares of the land for businesses were engaged in the growing of permanent crops (including some 36,360 ha under sugarcane and 300 ha under tea) which is 9 times more than that occupied by household farmers in this activity. The remaining land extents of non-household farms were tied up in the remaining land use types with very small areas kept fallow as well as having temporary meadows and pastures. Household farms devoted most of their land areas for growing permanent and temporary crops.

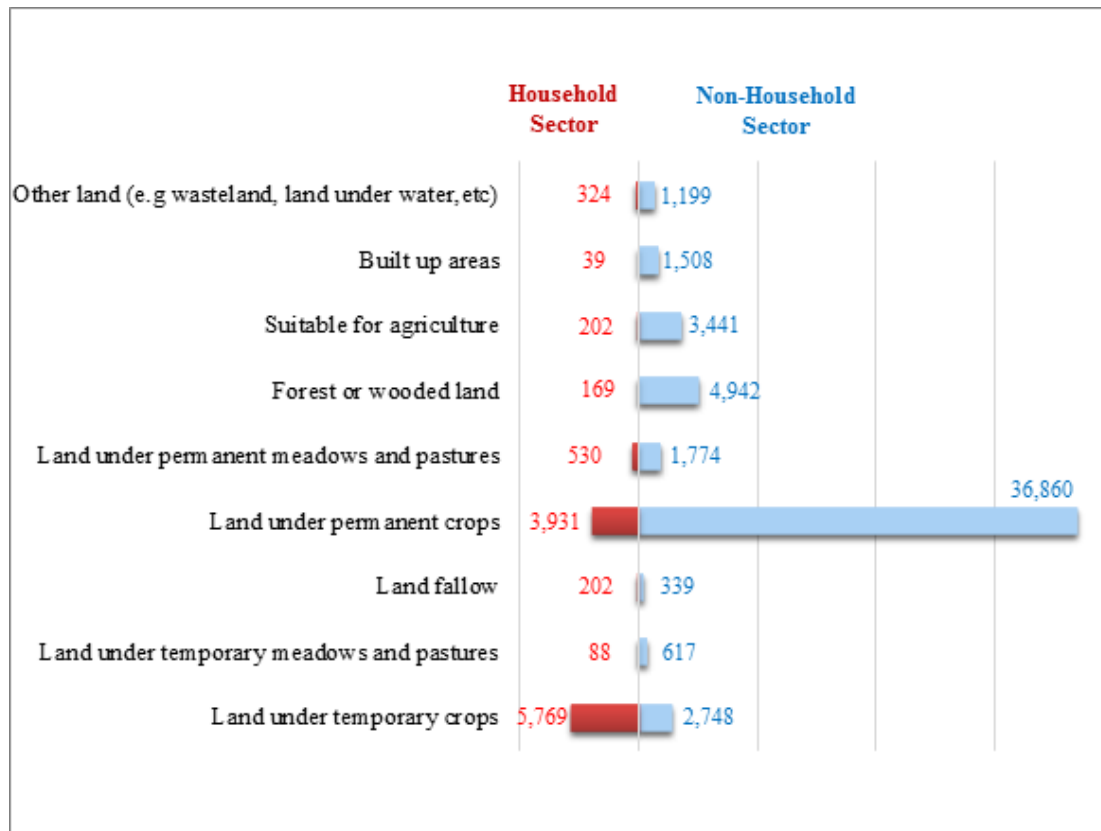


Figure 4: Comparison of land areas (ha) by basic land use type and sector, July 2013 – June 2014, IOM

4.1.5 Comparison of land use of household and non-household farms by main land use type

Table 6 below has been prepared based on FAO recommended groupings of basic land use types into main land use types such as agricultural land, cropland and arable land as defined under section 1.1.

Table 6: Land extents by main land use type and sector, July 2013 – June 2014, IOM

(Hectares)

Main Land Use Type	Non-Household sector	Household sector	Both sectors
Agricultural Land	42,338	10,520	52,858
of which: <i>Cropland</i>	40,564	9,990	50,554
of which: <i>Arable Land</i>	3,704	6,059	9,763
Forest or wooded land	4,942	169	5,111
Other lands	6,148	565	6,713
All Types	53,428	11,254	64,682

Figure 5 shows graphically the extent and percentage of land exploited by household farmers and businesses under each main land use type.

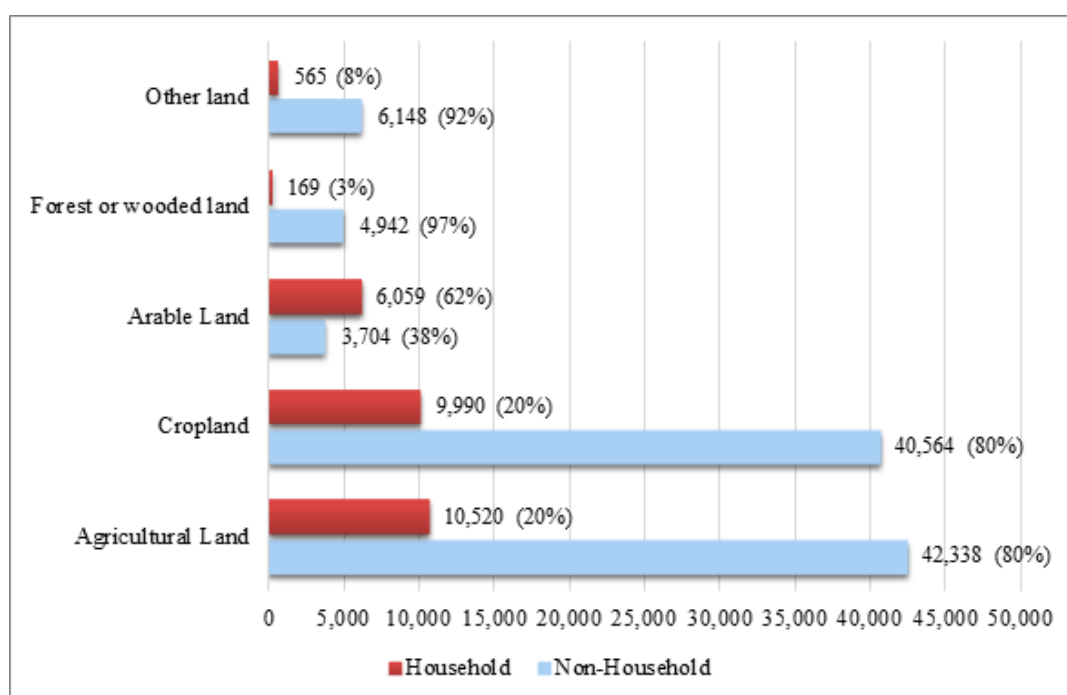


Figure 5: Distribution of land extents by main land use type and sector, July 2013 – June 2014, IOM

Most of the available agricultural lands as well as croplands were occupied by businesses and represented 80% of the total extent in each main type.

However, around 62% of available arable land (land under temporary crops, land under temporary meadows and temporarily fallow) were occupied by household farmers when compared to businesses.

Regarding forest and other land, businesses predominated with more than 90% occupancy.

4.1.6 Land extents available to household farms by main land use type and district

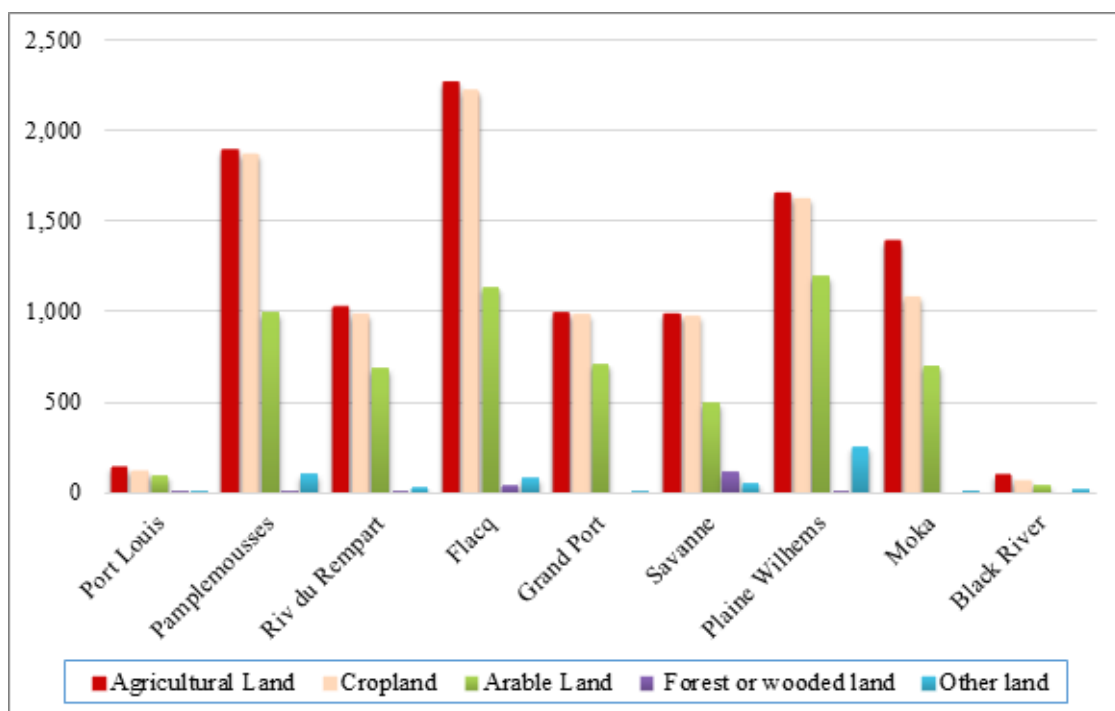


Figure 6: Distribution of land extents available to household farms by main land use type and district, July 2013 – June 2014, IOM

Figure 6 shows that the maximum extent of both agricultural land and cropland was found in the district of Flacq. Despite the large extent of the Black River district it appears to be the least occupied by farmers. The main reason might be the amount of rainfall in this district, the driest one of the Island of Mauritius.

In the district of Pamplemousses, more than 10% of the areas were occupied by household farms as agricultural land (Figure 7).

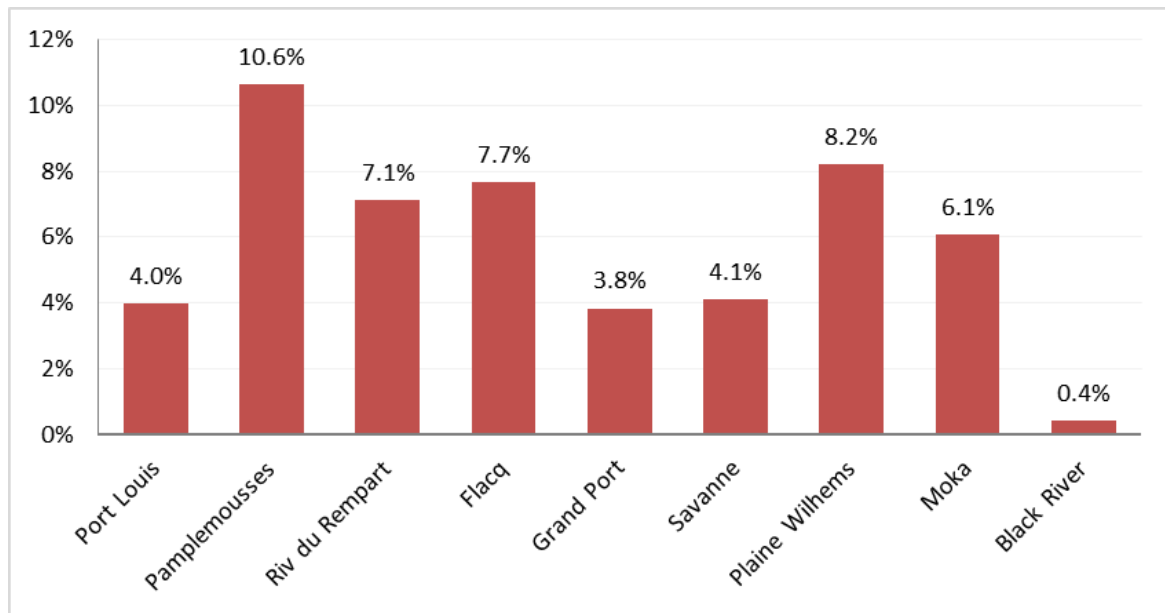


Figure 7: Agricultural extent occupied by household farms expressed as a percentage of respective district area by district, July 2013 – June 2014, IOM

These farms were engaged in growing of both temporary and permanent crops on more than 10% of the available district area of Pamplémousses (Figure 8).

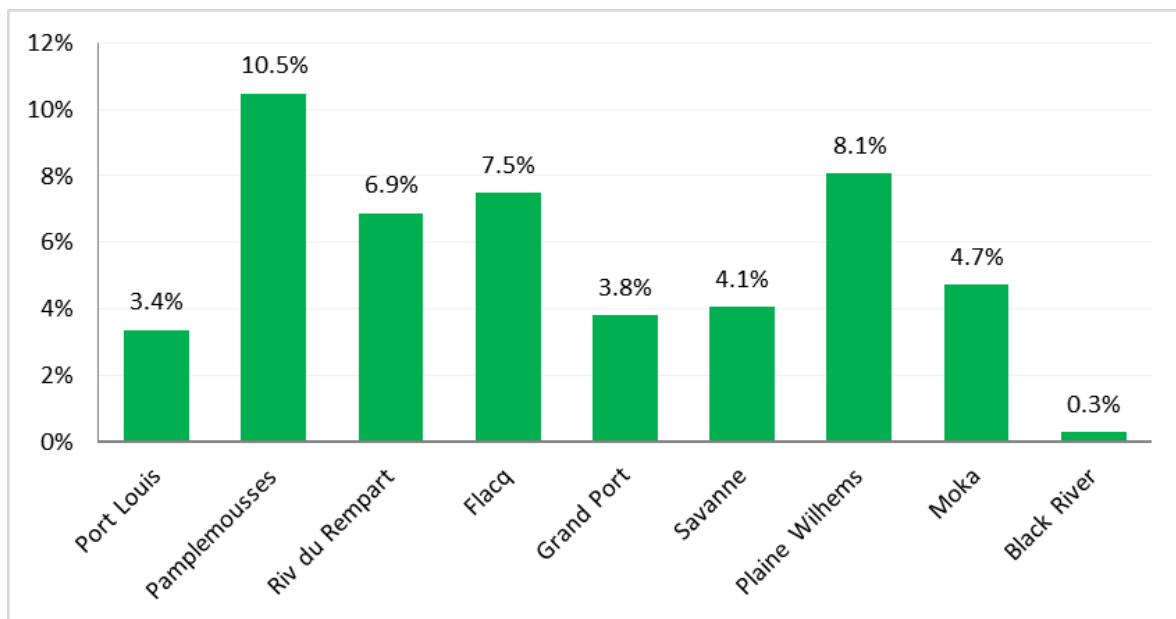


Figure 8: Cropland extent occupied by household farms expressed as a percentage of respective district area by district, July 2013 – June 2014, IOM

Around 6% of the Plaines Wilhems district areas were occupied by household farms for growing of temporary crops, temporary meadows and pastures and at the same time keeping the land fallow (Figure 9).

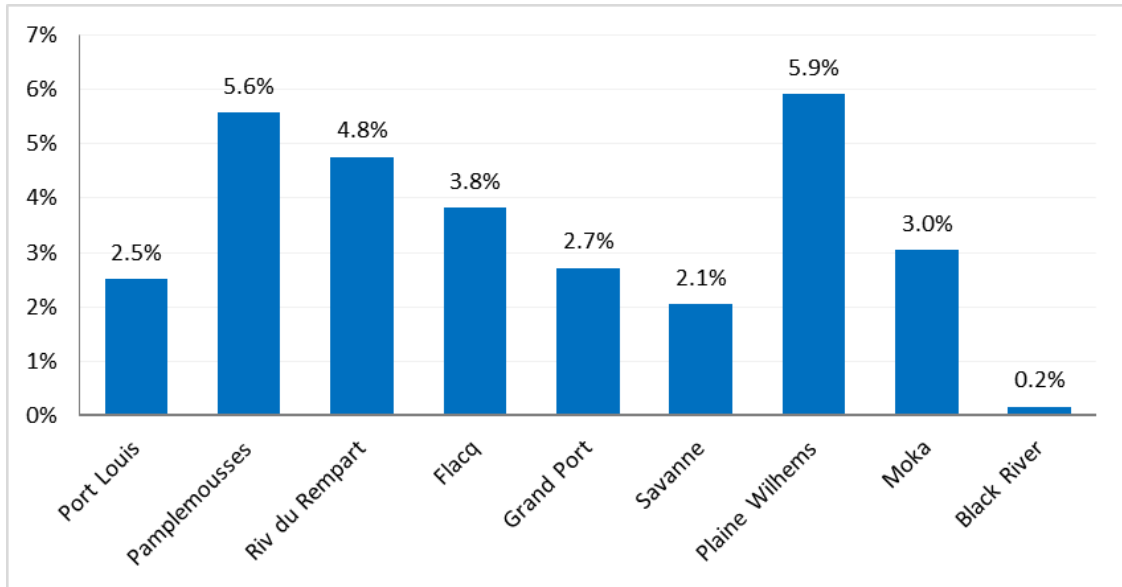


Figure 9: Arable land extent occupied by household farms expressed as a percentage of respective district area by district, July 2013 – June 2014, IOM

Less than 0.5% of the total 26,087 hectares comprising the Black River district were occupied by household farms as agricultural land, cropland or arable land. More details on extent of lands occupied by household farms by main land use and district are found at Table 10 of Appendix 1.

4.1.7 Average area (ha) per household farm by district

Figure 10 shows that the district of Moka had the highest average area of land per household farm (0.925 ha) while the Black River district had the smallest average area (0.186 ha).

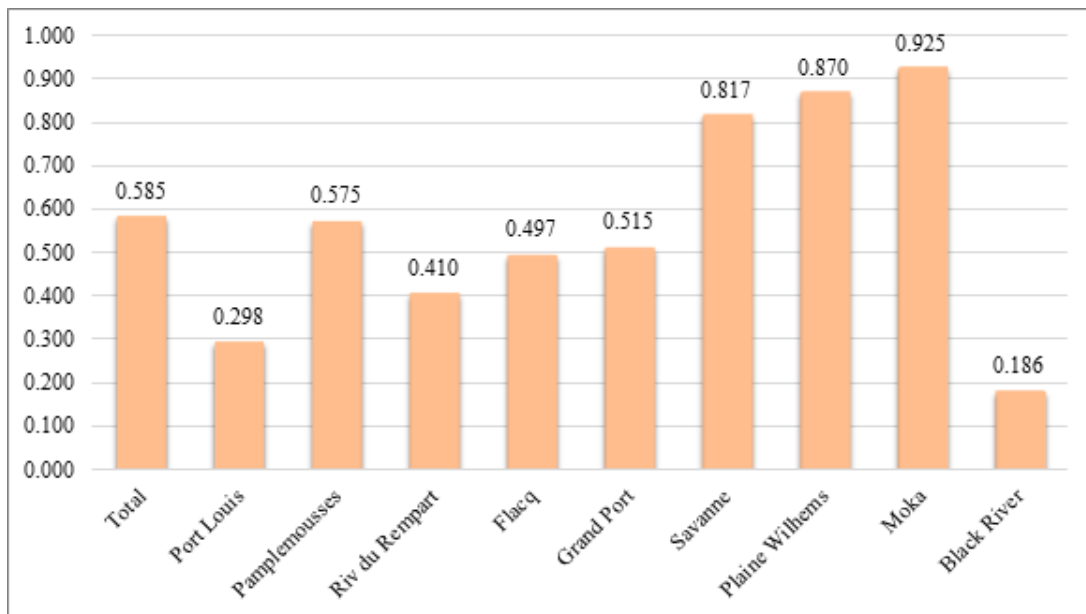


Figure 10: Average area (ha) per household by district, July 2013 – June 2014, IOM

4.1.8 Extent of lands of non-household farms by basic land use type and type of business ownership

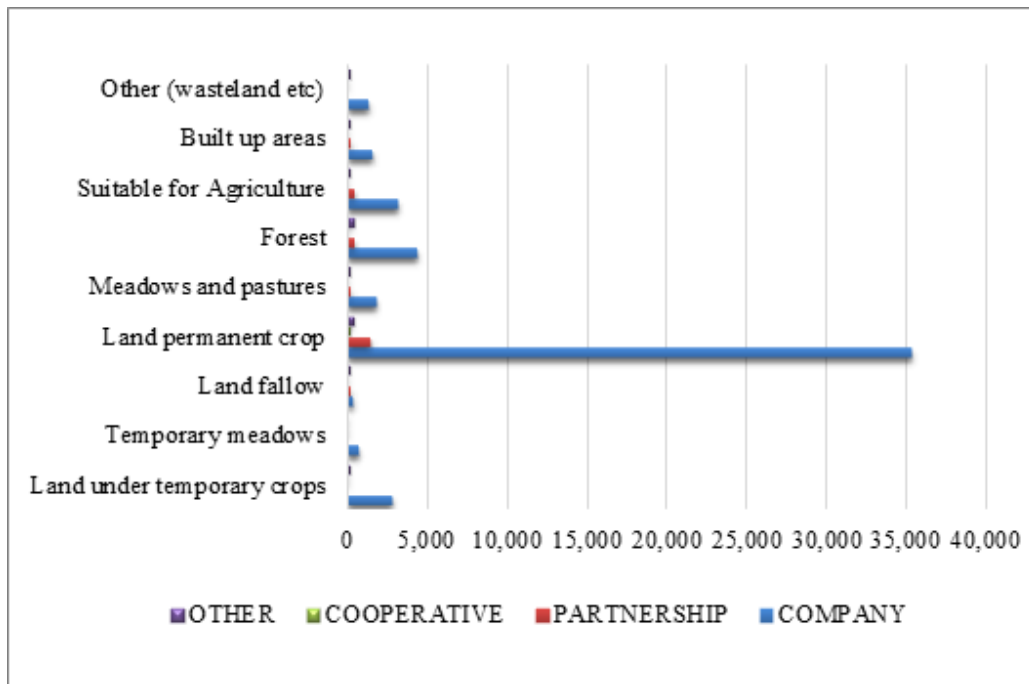


Figure 11: Area utilised by basic land use type and type of business ownership, July 2013 – June 2014, IOM

Figure 11 shows that agricultural companies occupied most of the land available for agricultural purposes in the non-household sector. This represented 70% of the total extent of the 50,590 hectares exploited by companies mainly for growing of permanent crops alone. It was also observed that companies exploited small extents of their land in all of the remaining basic land use types.

By considering the total land areas in this category, it is observed that 95% of them were occupied exclusively by companies as shown in Figure 12 below. The remaining land areas were shared among partnerships, cooperatives and other types of businesses.

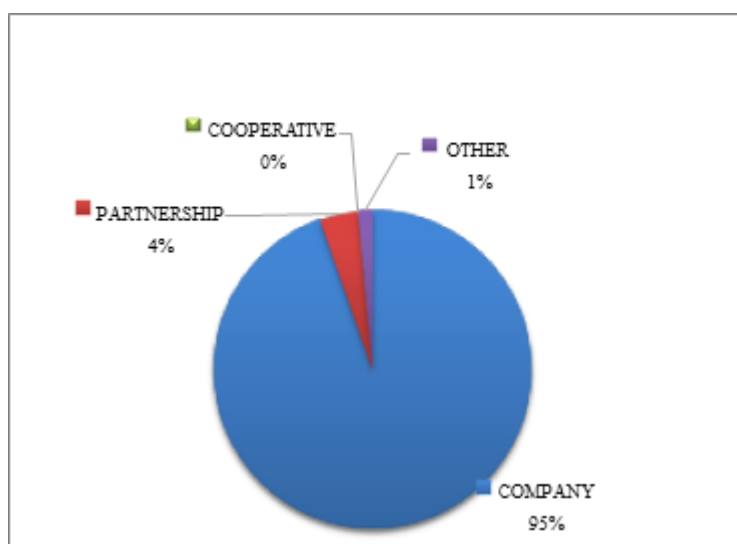


Figure 12: Percentage land area utilised for agricultural purposes by business ownership type, July 2013 – June 2014, IOM

4.1.9 Land area utilised by main land use type and business ownership type

Table 7 shows the total areas occupied by the different type of business ownership under each main land use type. It was observed that companies occupied most of the agricultural lands, forests and other lands when compared to the remaining types of business ownership. Cooperatives occupied a negligible amount of agricultural lands when compared to the 96% managed by companies (Figure 13). Only 3% of agricultural lands were occupied through partnerships while the remaining extents were being utilised by the other type of business ownership.

Table 7: Area utilised by main land use type and business ownership type (Non-household Sector), July 2013 – June 2014, IOM

(Hectares)

Main Land Use Type	Company	Partnership	Cooperative	Other	All ownership types
Agricultural Land	40,580	1,380	11	367	42,338
Cropland	38,815	1,374	11	364	40,564
Arable Land	3,643	45	-	16	3,704
Forest or wooded land	4,236	319	-	387	4,942
Other land	5,774	349	-	25	6,148
All Types	93,048	3,467	22	1,159	97,696

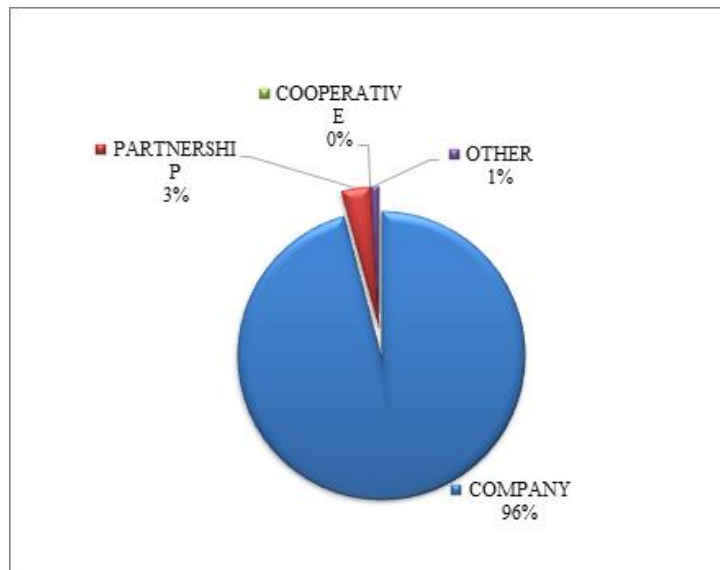


Figure 13: Percentage of agricultural land area utilised by type of business ownership, July 2013 – June 2014, IOM

4.1.10 Total number of land parcels operated by household farms by district

Figure 14 shows that districts of Flacq and Pamplemousses had high numbers of land parcels compared to the other districts. The district of Port Louis had the lowest number followed by Black River district.

More details on number of land parcels operated by household farms are found at Table 11 of Appendix 1.

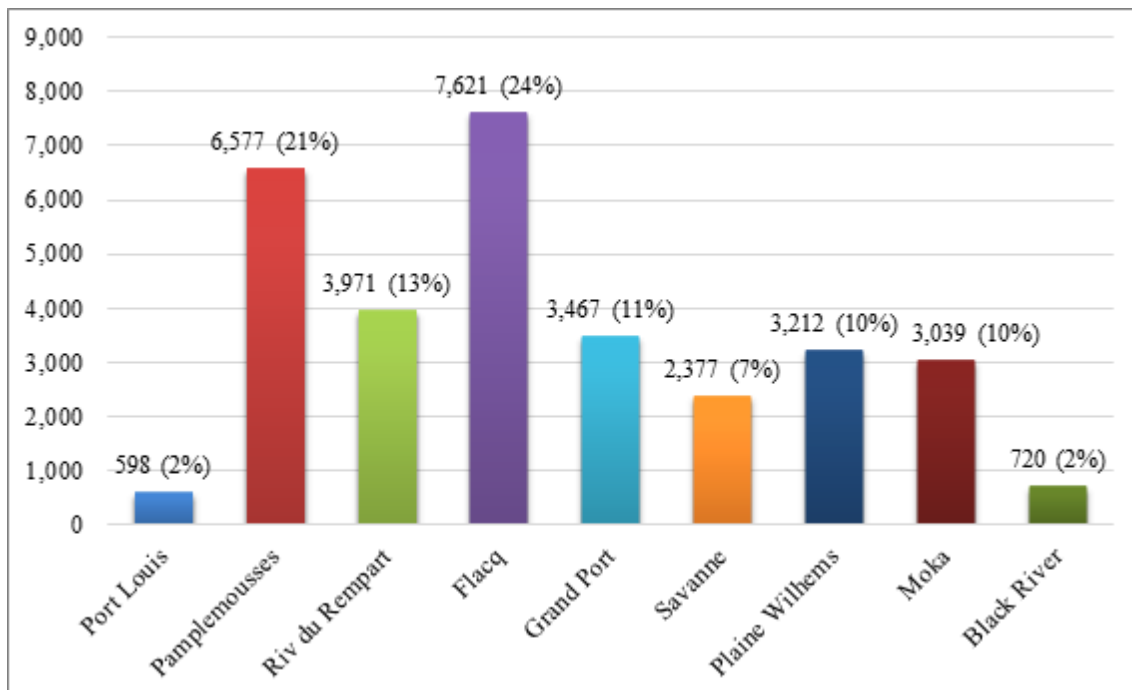


Figure 14: Distribution of land parcels operated by household farms by district, July 2013 - June 2014, IOM

In terms of percentages of the total number of land parcels over the Island of Mauritius, the northern and eastern parts of Mauritius operated around 60% of the total land parcels used for agricultural production namely by the districts of Pamplemousses, Riviere du Rempart and Flacq. The remaining 40% were shared among the other six districts.

4.1.11 Average area per parcel operated by household farms by district

Figure 15 shows that on average, household farms operated less than 1 ha of agricultural land per parcel in all districts. The district of Plaine Wilhems had the highest average area per land parcel of 0.6 ha/parcel, while Black River had the least value of 0.18 ha/parcel.

More details on area of land parcels operated by household farms are found at Table 12 of Appendix 1.

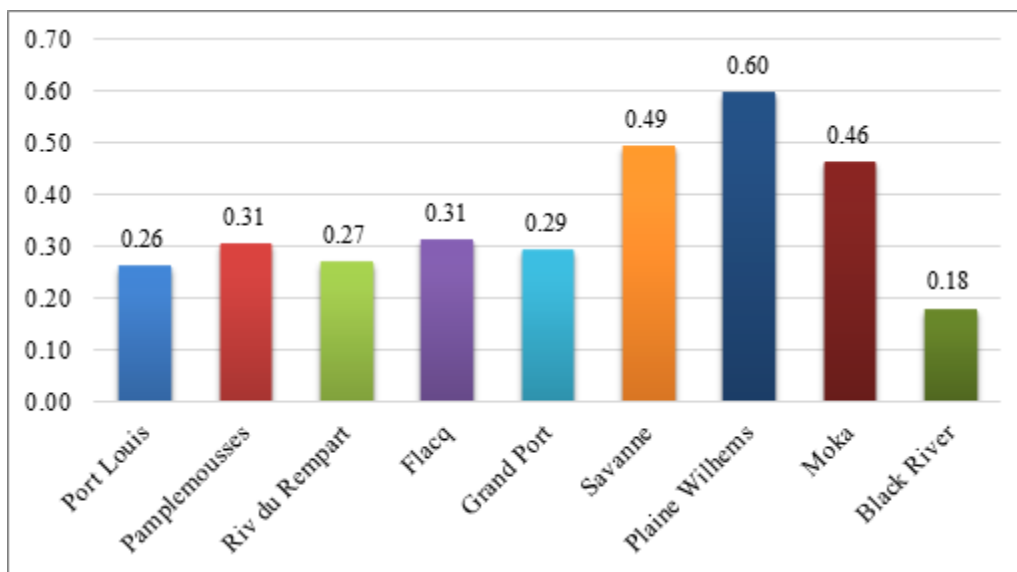


Figure 15: Average area (ha) per land parcel operated by household farms by District, July 2013 - June 2014, IOM

4.1.12 Average number of parcels per household farm by district

Figure 16 shows the average number of land parcels occupied per household in each district. The average value exceeded one in all districts. However, the district of Moka and Pamplemousses had the highest average number of nearly 2 land parcels per household farm.

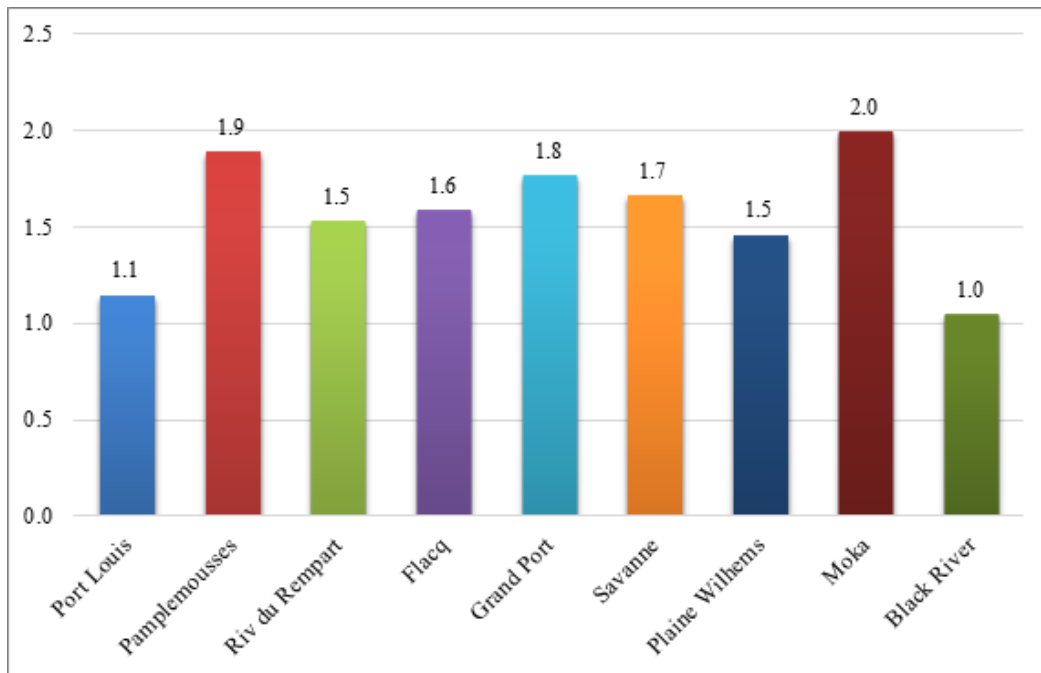


Figure 16: Average number of land parcels per household farm by district, July 2013 - June 2014, IOM

4.1.13 Number of land parcels operated by household farms by parcel size

Excluding land parcels having less than 5 perches in extent, the total number of land parcels in each size range shown in Figure 17. It may be depicted from these figures that plot size range 200-499 perches is the most dominating one representing 25% of the parcels occupied by individuals in the Island of Mauritius. Some 17% and 14% of the number of parcels fell in the size ranges of 5-24 perches and 100-149 perches respectively. Large parcels, exceeding 1000 perches, represented only 3% of all the parcels.

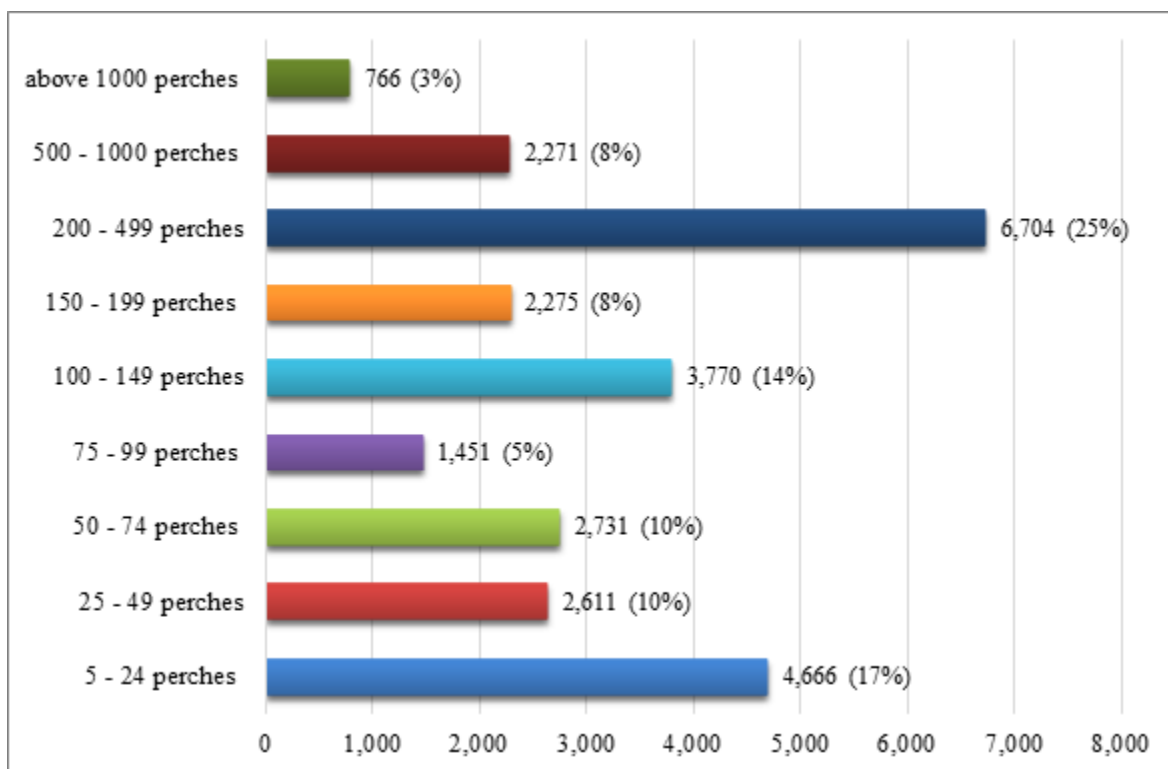


Figure 17: Distribution of land parcels of household farms by parcel size, July 2013 - June 2014, IOM

4.1.14 Number of land parcels exploited by household farms by size and district

Figure 18 shows that the highest number of land parcels belonged to the 200-499 perches range in the districts of Pamplemousses, Riviere du Rempart, Flacq, Grand Port, Plaines Wilhems and Moka. Parcel size in the range of 5-24 perches predominated in the districts of Port Louis, Savanne and Black River. Despite being large in size, i.e. over 1000 perches, they were least in numbers in the districts of Port Louis, Moka and Black River.

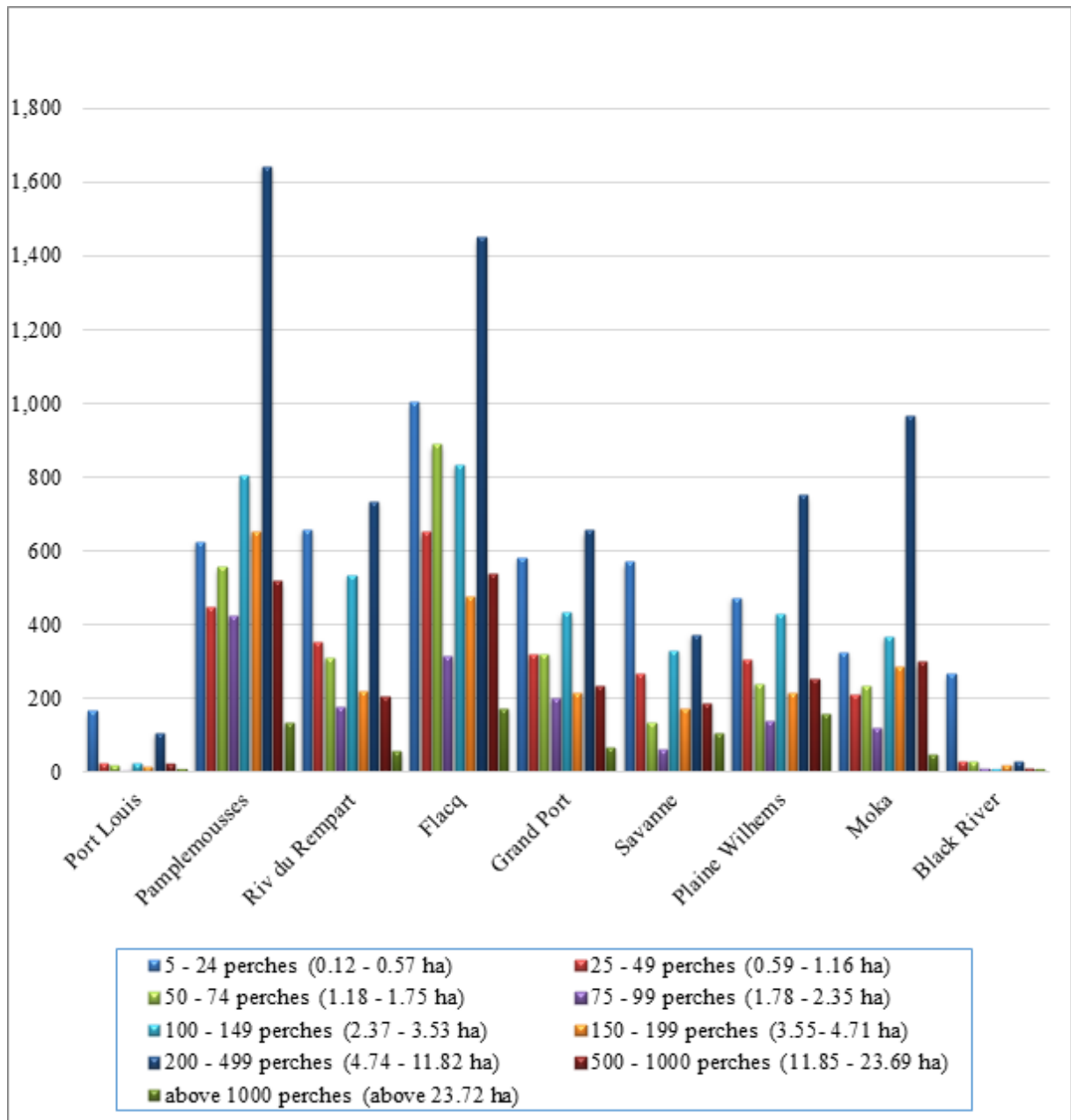


Figure 18: Distribution of land parcels operated by household farms by size and district, July 2013 - June 2014, IOM

4.1.15 Total area of parcels operated by household farms by district

Figure 19 shows the total areas and respective percentages of agricultural land parcels occupied by household farms in each district. It was observed that farmers in the Flacq district exploited the highest total land area for agricultural activities representing 21% of total parcel areas available to household farmers for agricultural purposes. This was followed by the district of Pamplemousses (2,008 ha or 18%) and Plaines Wilhems (1,916 ha or 17%). Both districts of Port Louis and Black River had the smallest land parcel areas representing 1% of the total parcel areas each.

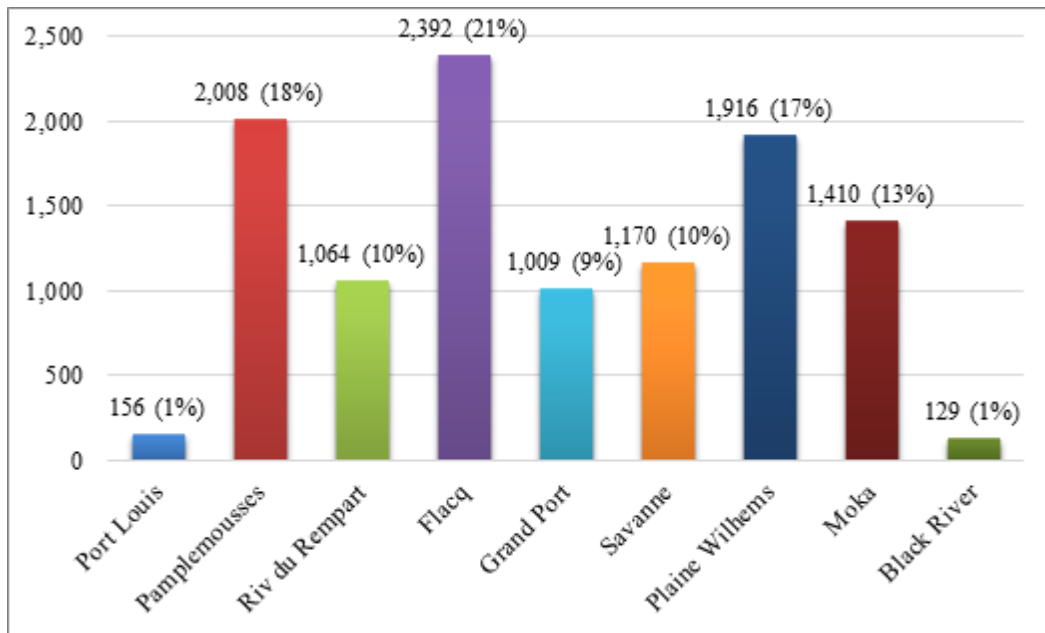


Figure 19: Total area of land parcels operated by household farms by district, July 2013 - June 2014, IOM

4.1.16 Area operated by household farms as a percentage of district area

The percentage of district area utilised for agricultural purposes ranged from a minimum of less than 1% for Black River to a maximum of 11% for Pamplemousses as shown in Figure 20.

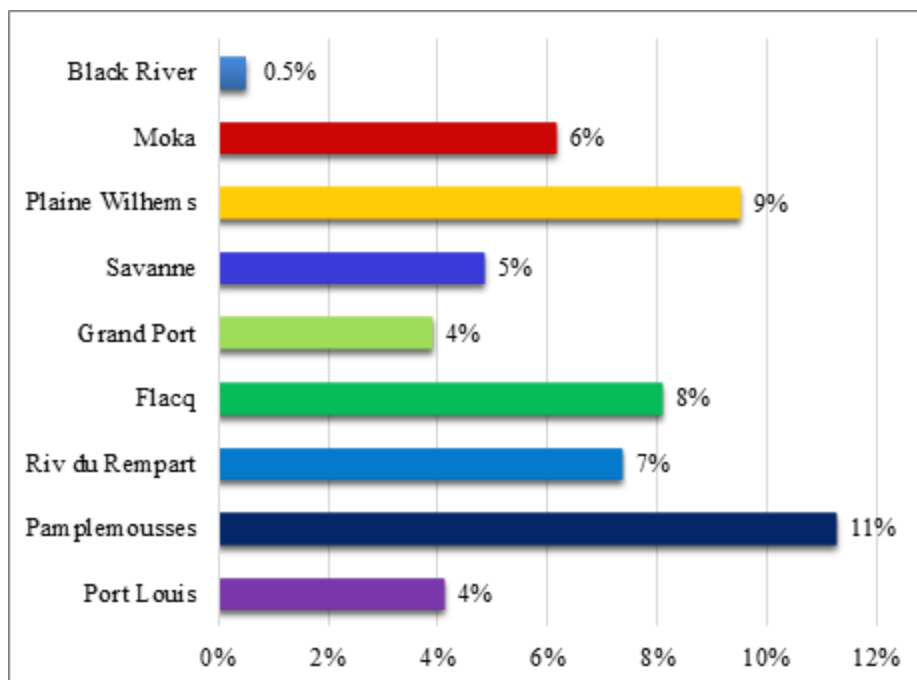


Figure 20: Area operated by household farms as a percentage of district area, July 2013 - June 2014, IOM

4.1.17 Distribution of area of land parcels of household farms by size and district

Figure 21 shows that the district of Plaines Wilhems possessed the highest total land area in the size range exceeding 1000 perches, followed by Savanne. Other popular parcel sizes were 200-499 perches and 500-1000 perches in nearly all districts.

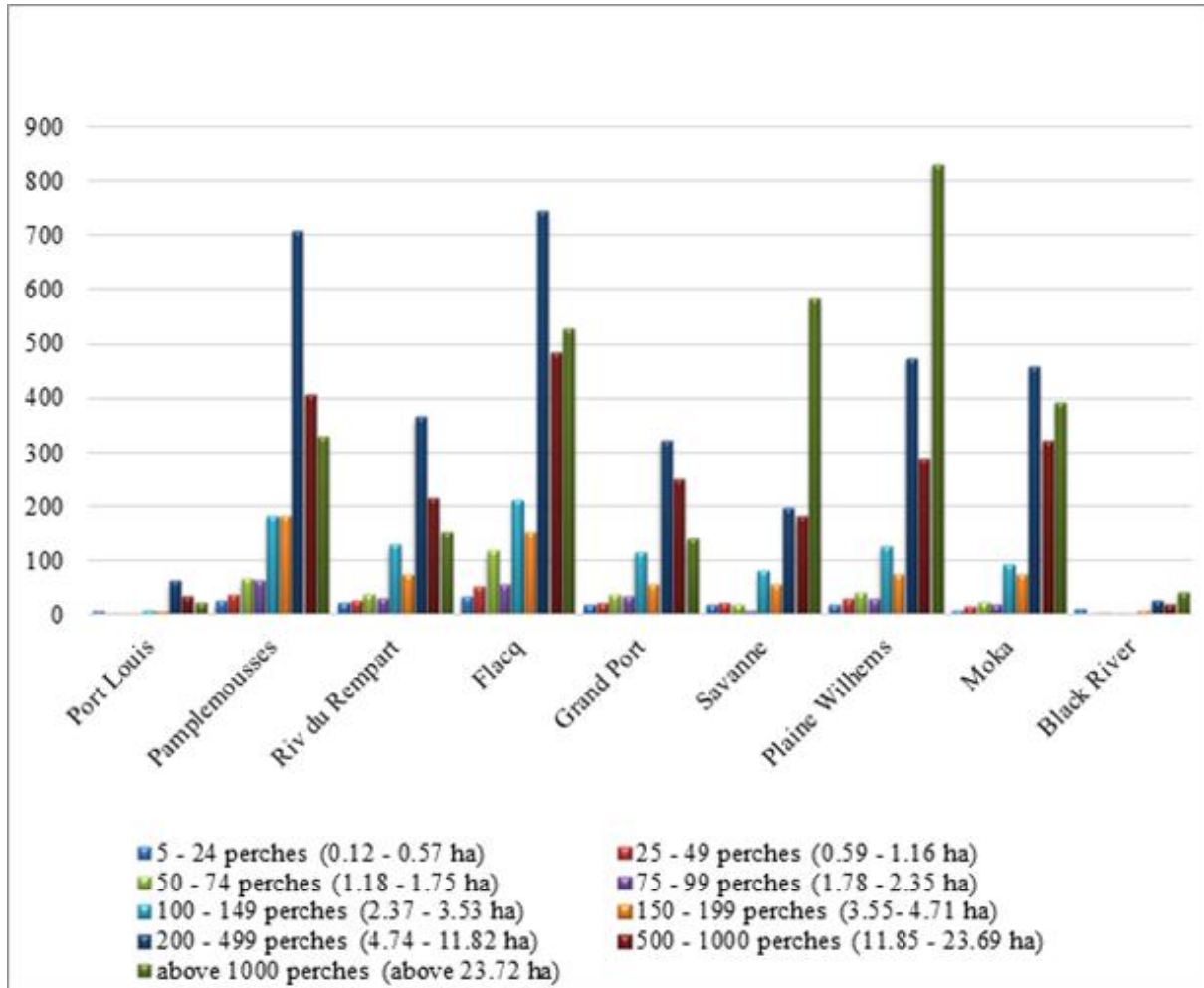


Figure 21: Distribution of area of land parcels of household farms by size and district, July 2013 - June 2014, IOM

4.1.18 Distribution of the number of farmers in each parcel size range by district for household farms

Figure 22 shows that the district of Flacq had the highest number of farmers possessing land parcels in the ranges of 5-24 perches, 50-74 perches, 100-149 perches and 200-499 perches. Most of the farmers in the remaining districts had land parcels in the range of 5-24 perches followed by 200-499 perches and 100-149 perches.

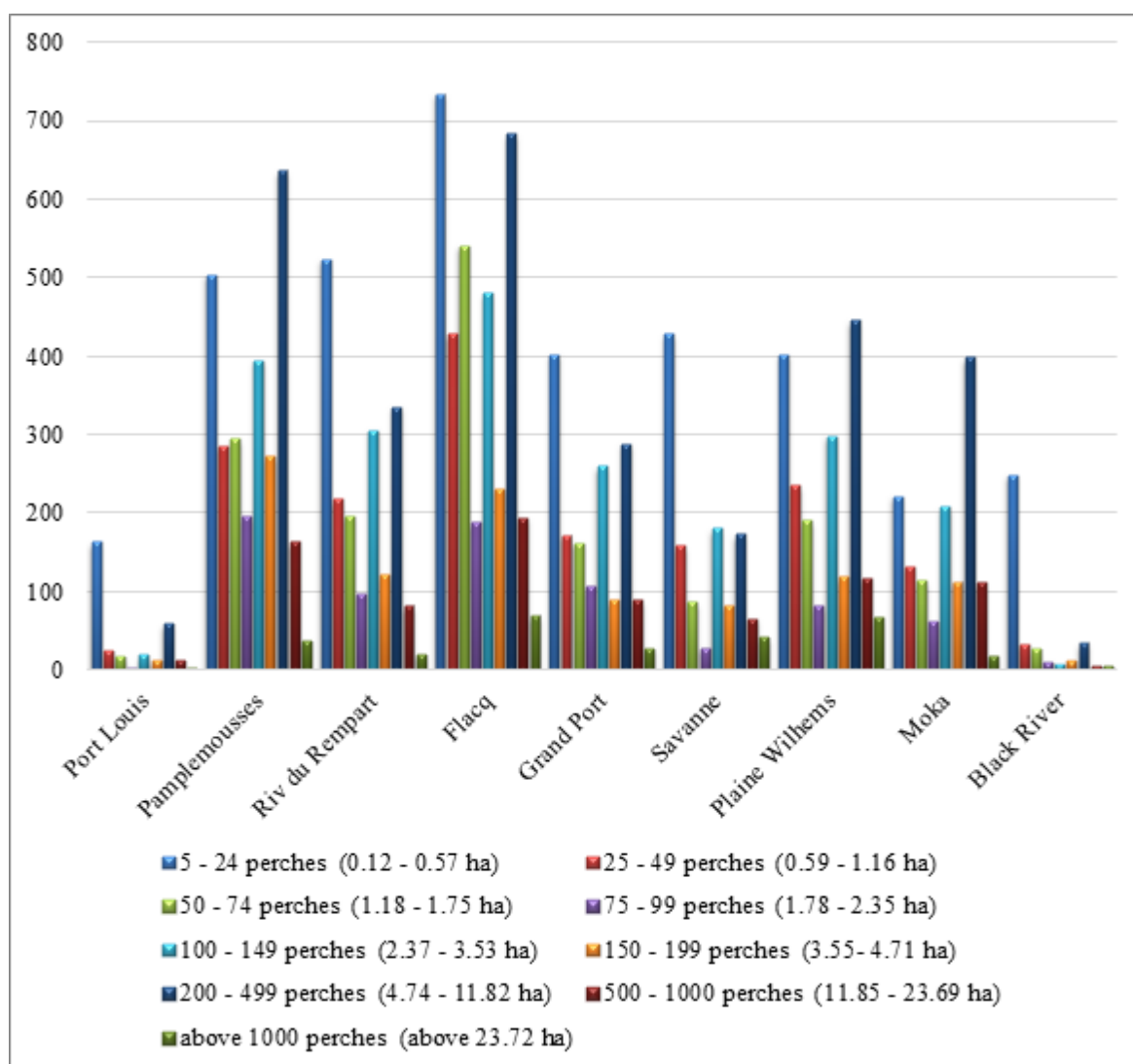


Figure 22: Distribution of farmers of household farms by parcel size and district, July 2013 - June 2014, IOM

4.1.19 Distribution of farmers of household farms by parcel size

Figure 23 shows that out of the total number of household farms, 40% of the individual farmers in the Island of Mauritius possess parcels in the size range 0-24 perches followed by 16% and 11% for the ranges 200-499 perches and 100-149 perches respectively.

More details on number of farmers of household farms by parcel size are found at Table 13 of Appendix 1.

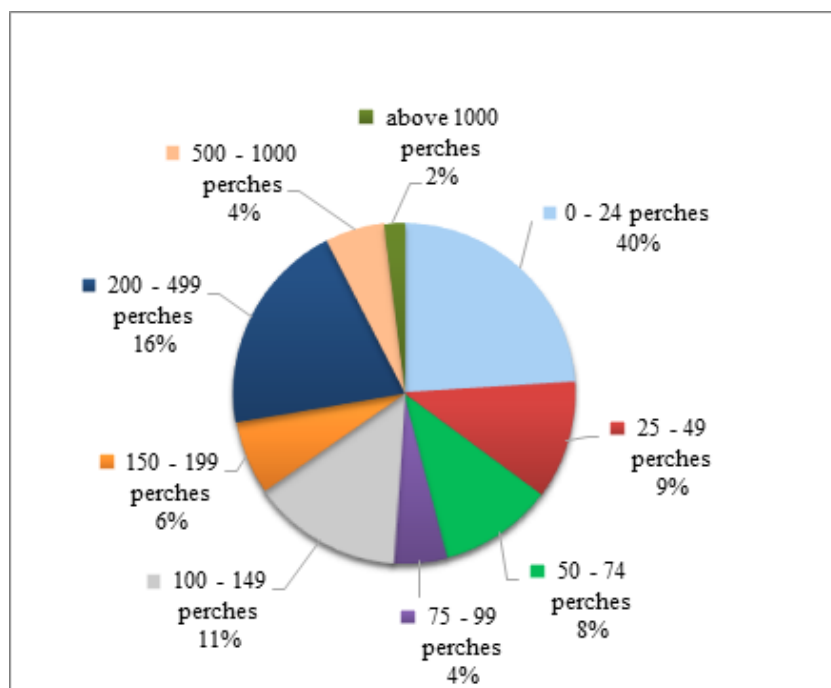


Figure 23: Percentage of farmers of household farms by parcel size, July 2013 - June 2014, IOM

4.1.20 Number of farmers of household farms by parcel size and district

Figure 24 shows that out of the total number of household farmers in the Island of Mauritius, 25% of them exploited land parcels in the district of Flacq, followed by Pamplemousses (18%), Riviere du Rempart (14%), Plaine Wilhems (11%), Grand Port (10%), Moka (8%), Savanne (7%), Black River (4%) and Port Louis (3%).

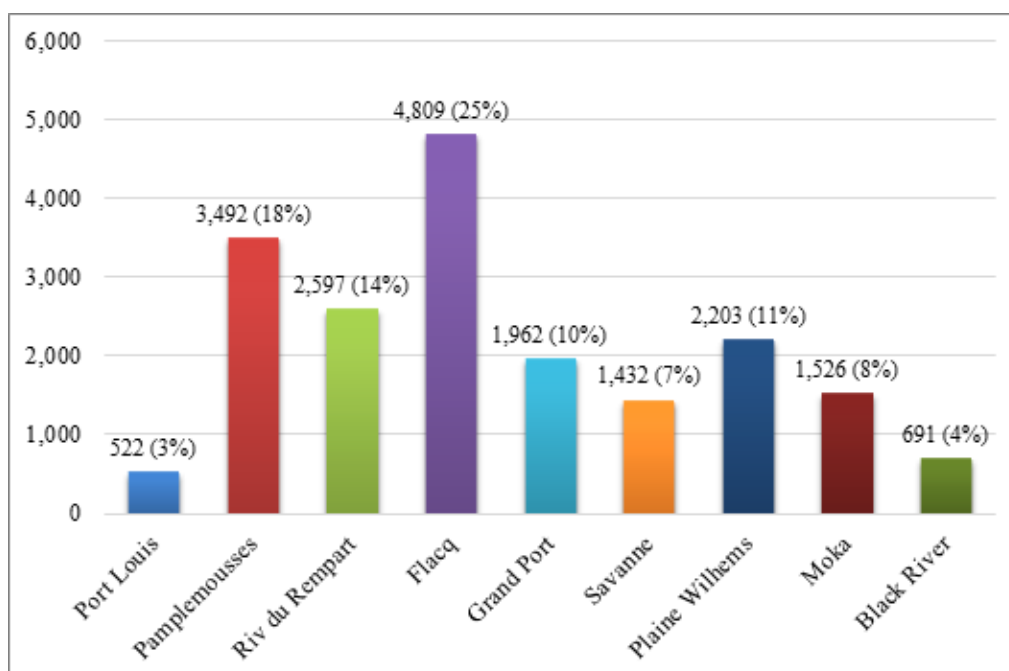


Figure 24: Number of land parcels occupied by farmers by district, July 2013 - June 2014, IOM

4.1.21 Land area by land tenure type

Figures 25 and 26 show graphically the extent of land areas exploited under each land tenure type for non-household and household farms respectively. The percentages of area of land exploited under each land tenure type are as shown in parentheses.

In the non-household sector, 95% of the agricultural land was owned by businesses while only 5% were rented from Government and others.

However, in the household sector 46% of agricultural lands were owned by individual farmers, while 41% was rented from others and 10% was leased from Government. Only 3% of the land areas fell under the other types of land tenure category.

Figures 25 and 26 depicted that land leased by Government to businesses was twice as much as that leased to household farmers. More details on land area by tenure type and sector are found at Table 14 of Appendix 1.

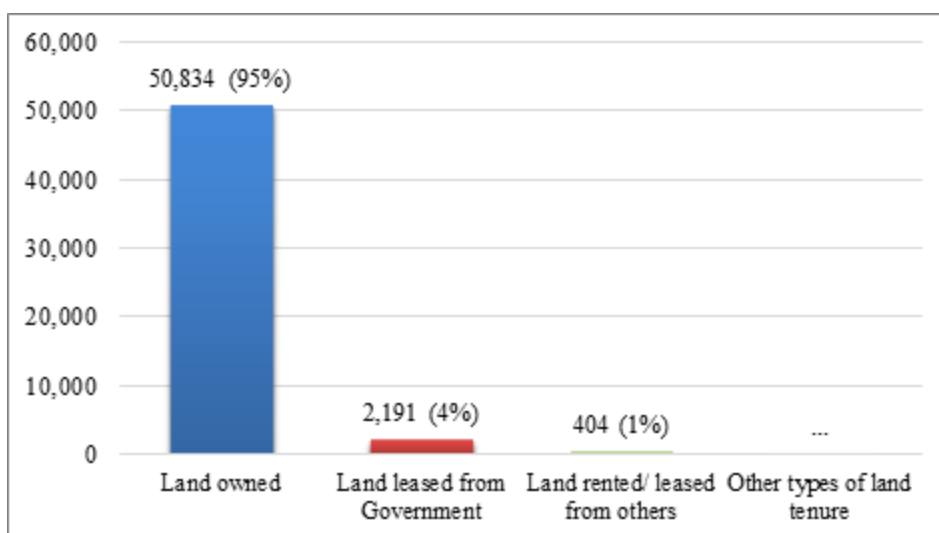


Figure 25: Agricultural land areas (ha) of non-household farms by land tenure type, July 2013 - June 2014, IOM

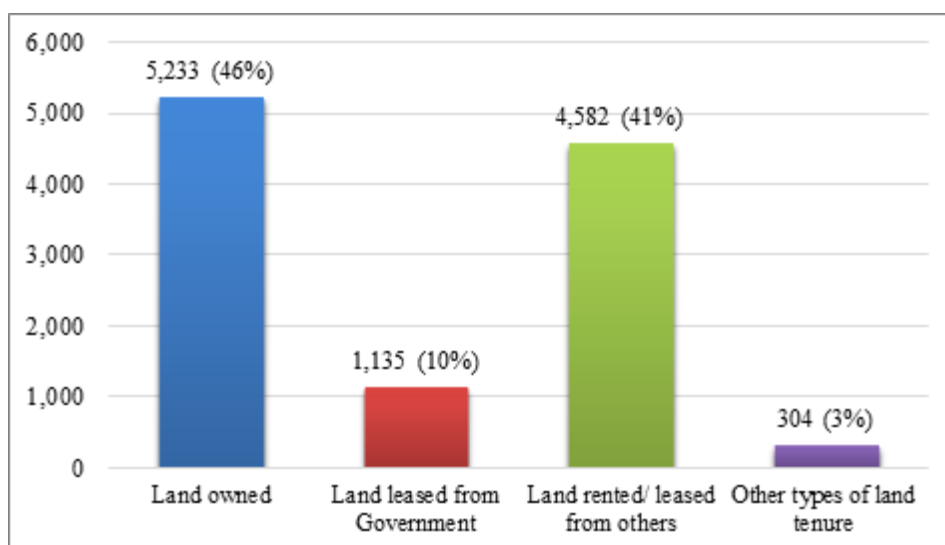


Figure 26: Agricultural land areas (ha) of household farms by land tenure type, July 2013 - June 2014, IOM

4.1.22 Distribution of area by district for each household land tenure type

Figure 27 shows the distribution of area by district for each land tenure type in the Island of Mauritius. Flacq with 1,303 ha was the district having the highest area of land owned for agricultural purposes by household farmers followed by Pamplemousses (1,131 ha) and Plaines Wilhems (917 ha).

Plaines Wilhems was the district containing the highest amount (414 ha) of State Land leased to individuals for agricultural purposes followed by Flacq (287 ha) and Moka (163 ha). Much smaller amounts were leased to individuals in Pamplemousses, and Grand Port districts. The remaining districts had negligible amount of state lands leased to household farmers.

With the exception of Port Louis and Savanne districts, all contained a significant amount of land leased from private owners for agricultural purposes. An average of 738 ha of land was leased from private owners in each of the districts of Pamplemousses, Flacq, Savanne and Moka. For the three districts of Riviere du Rempart, Grand Port and Plaine Wilhems the average turned out to approximately 525 ha per district.

With the exception of Black River with only 2 ha of land, an average extent of 38 ha falling under the other types of land tenure type could be attributed to each of the remaining districts.

More details on land area of household farms by tenure type and district are found at Table 15 of Appendix 1.

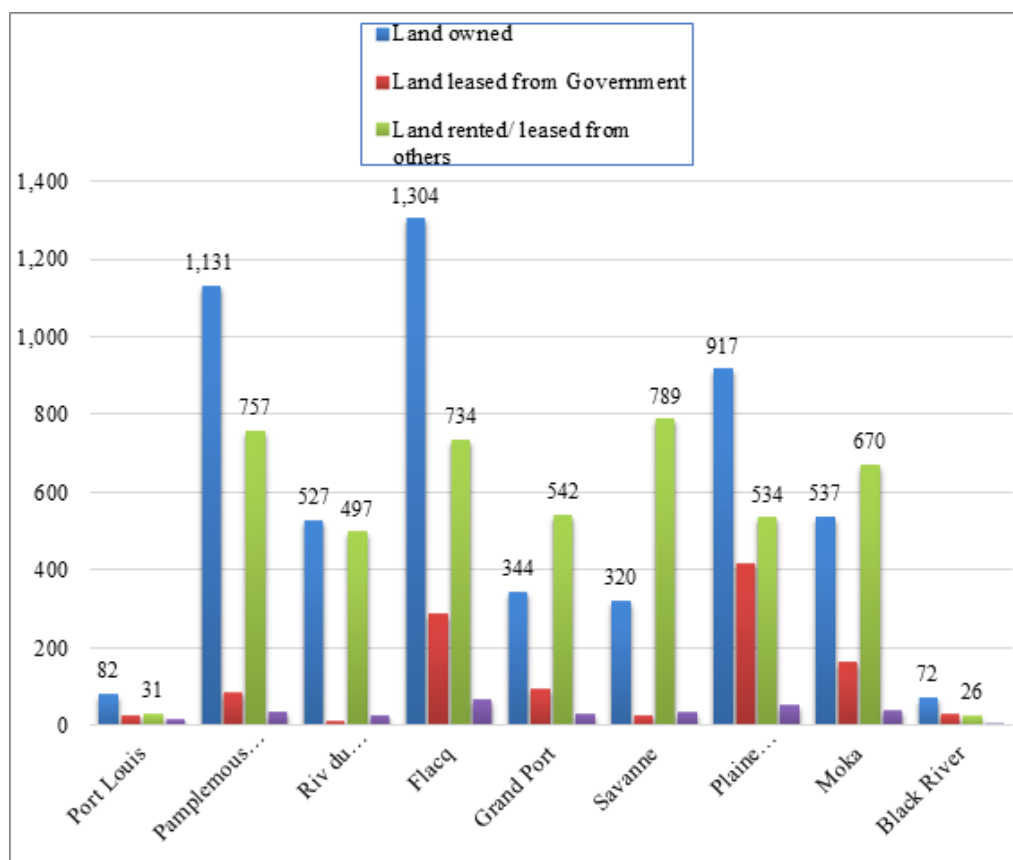


Figure 27: Areas (ha) of household farms by land tenure type and district, July 2013 - June 2014, IOM

4.1.23 Land rented to others

The amount of land rented to others by businesses was 8 times higher than that rented by household farms in Mauritius as shown in Figure 28.

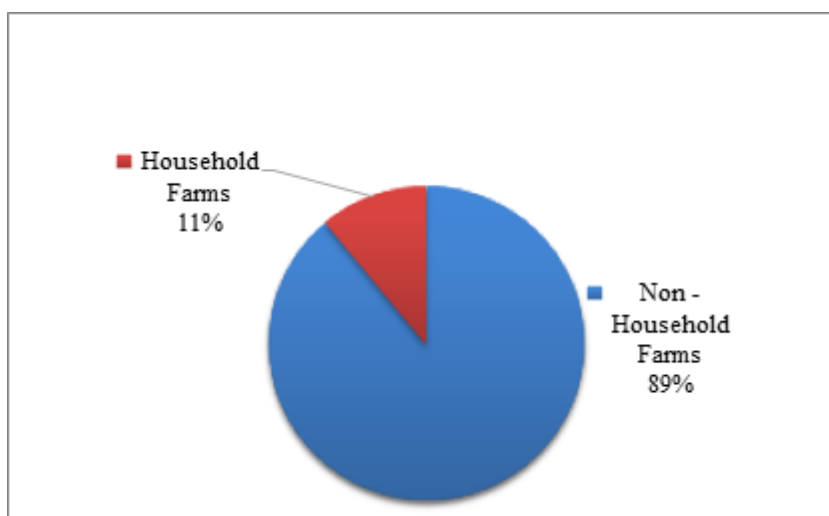


Figure 28: Percentage of land rented to others by household and non-household farms, IOM

4.2 LAND USE - ISLAND OF RODRIGUES

4.2.1 Land use of all farms

According to Figure 29, 66% of the lands devoted for agricultural purposes in Rodrigues was under temporary crops while approximately one tenth was under permanent crops and permanent meadows alike. Some 4% of land which was suitable for agriculture was not used for crop cultivation. Forest/woodland represented only 1 percent followed by built up areas and other land with less than 1%.

Arable land accounted for 75%, while cropland represented 84% and finally agricultural land comprised 94% of available land for agricultural purposes. Some 1% contained forest areas while the remaining 5% consisted of other land shared between land suitable for agriculture, built-up areas, wasteland, etc.

More details on land use by sector are found at Table 16 of Appendix 2.

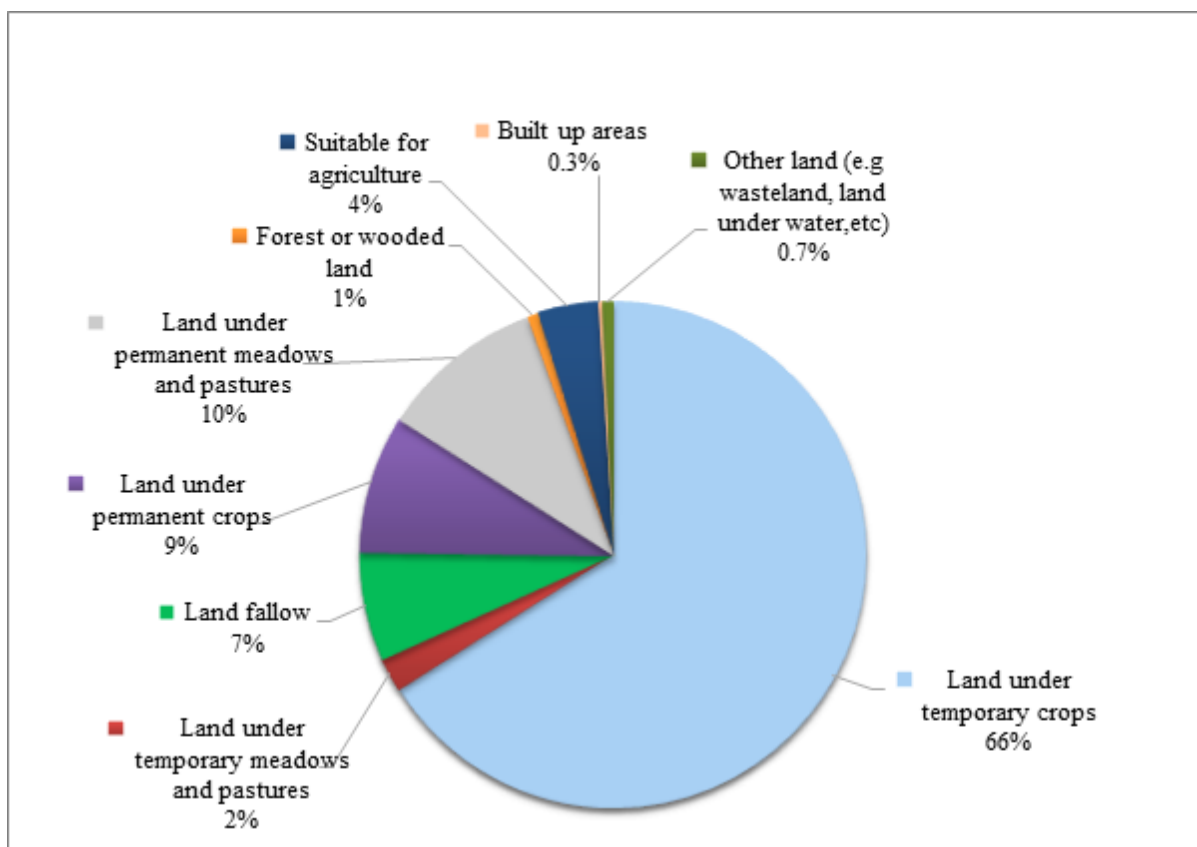


Figure 29: Percentage area of all farms by basic land use type, July 2013 - June 2014, IOR

4.2.2 Land use of non-household farms

The Rodriguan non-household farms occupied around 59% of their total 12 ha for the cultivation of temporary crops (Figure 30). Businesses had no land which were either under temporary meadows and pastures or permanent crops or forest/woodland or land suitable for agriculture or other lands. Only 25% of their land areas were under permanent meadows and pastures, while 8% were kept temporarily fallow. An extent of 8% was allocated to infrastructures under built up areas.

Regarding main land use, arable land areas represented 67% and were same for cropland as no land areas were devoted to land under permanent crops. Agricultural land comprised 92% of available land for agricultural purposes.

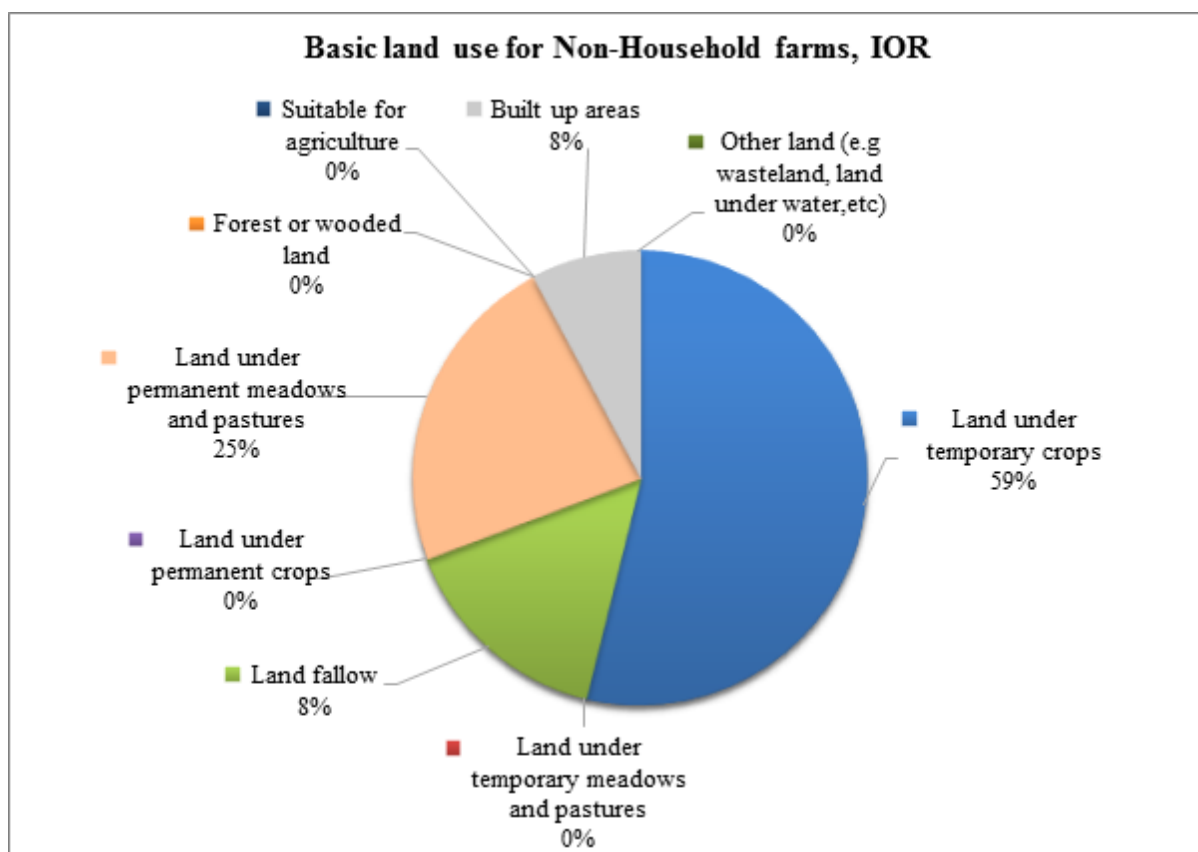


Figure 30: Percentage area of non-household by basic land use type, July 2013 - June 2014, IOR

4.2.3 Land Use of household farms

From Figure 31 below, 66% of the land available for agricultural purposes to household farms in Rodrigues was under temporary crops while approximately one tenth were under permanent crops and permanent meadows likewise. Some 4% of their land which was suitable for agriculture was not used for crop cultivation. Forest/woodland, built up areas and other land represent only 2 percent. It should be highlighted that built up areas represent only 0.3% of the total areas exploited by household farms.

An analysis by main land use type reveals that arable land accounted for 75%, while cropland represented 84% and agricultural land comprised 94% of available land for agricultural purposes. The remaining 6% consisted of other land class shared between land suitable for agriculture, built-up areas, wasteland, etc.

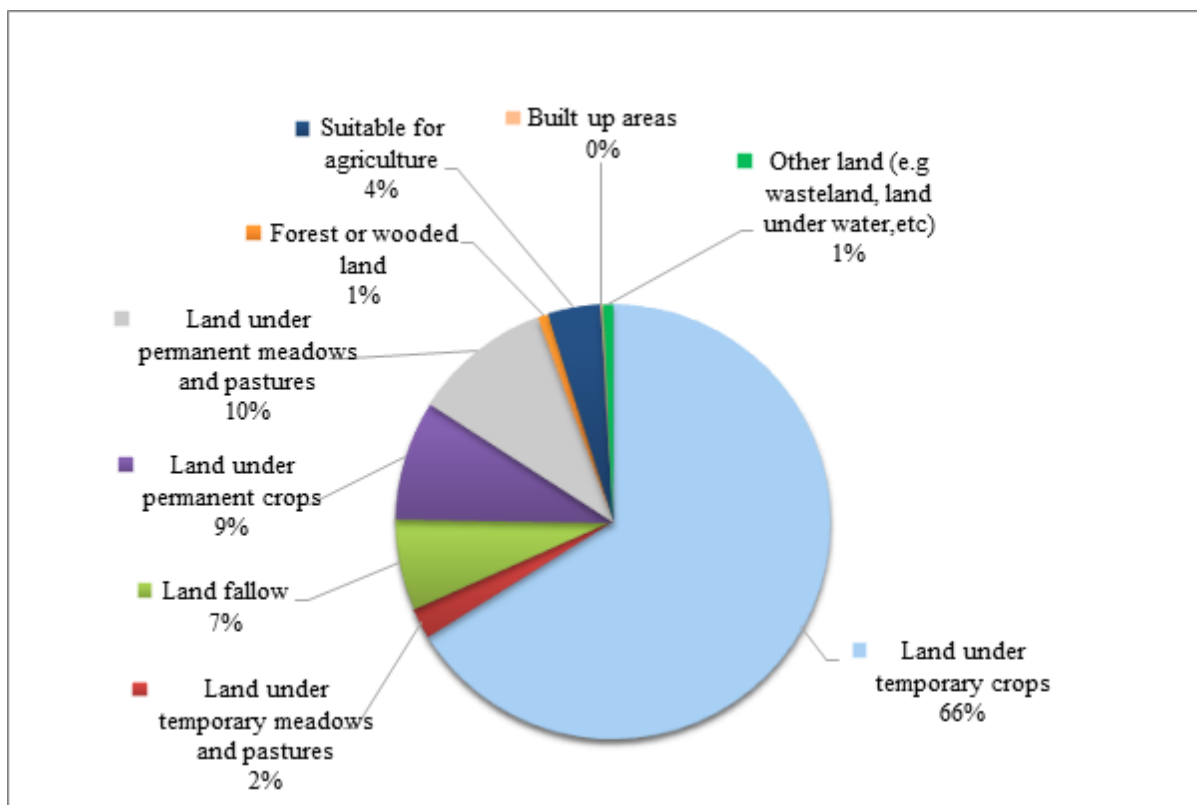


Figure 31: Percentage area of household farms by basic land use type, July 2013 - June 2014, IOR

4.2.4 Comparison of lands of household and non-household farms by basic land use type

Figure 32 shows that businesses did not occupy lands which were under temporary meadows, permanent crops, forest land, land suitable for agriculture or other land as compared to household farmers who occupied land in all the categories but in varying extents. Around 66% of lands, representing 1,161 ha, were available to household farms for growing temporary crops compared to some 54% or 7 ha for businesses. Household farms kept 7% or 121 ha of their lands fallow compared to 8% (or 1 ha) for businesses. 9% or 155 ha of the land of household farms contained permanent crops while 4% (68 ha) that were suitable for agriculture were not utilised. Businesses had a higher percentage of their land under permanent meadows and pastures (approximately 3 ha) when compared to 10% or 181 ha for household farms. Less than 4% of the land occupied by household farms fell under the basic land use type temporary meadows and pastures, forest or wooded land, built up areas and other land.

Household farms cultivated permanent crops on approximately 9% or 155 ha of their available total land area when compared to non-household farms which did not use their land for this activity. Around 8% representing 1 ha of their land extent were kept fallow by businesses when compared to the 7% (121 ha) for household farms.

Out of their respective total extent, no forest land was managed by businesses, while household farms occupied only 1% of their available land as forest.

Referring to Figure 32, most of the lands occupied by household farms were devoted to growing of temporary crops.

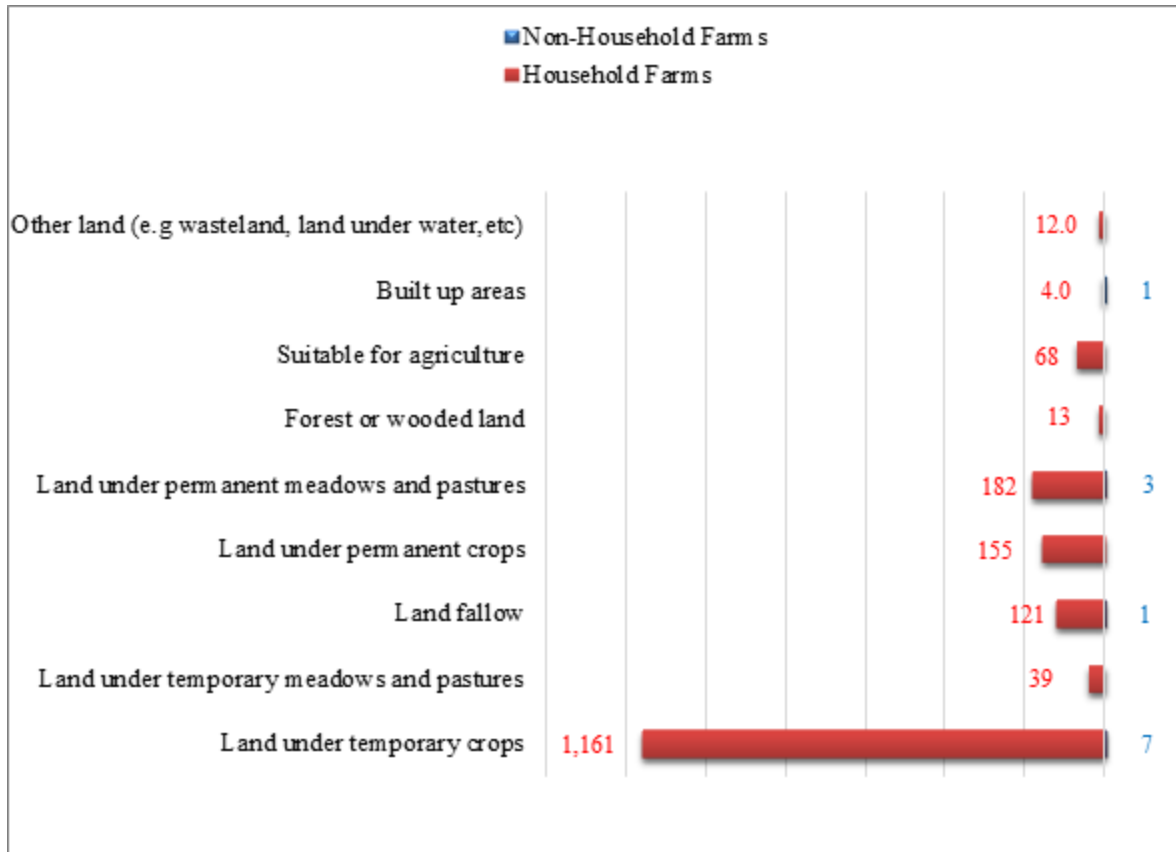


Figure 32: Comparison between extents of land (ha) occupied by household and non-household farms by basic land use type, July 2013 - June 2014, IOR

4.2.5 Comparison of land extents of household and non-household farms by main land use type, IOR

Figure 33 shows the extent of land exploited by household farms and businesses by main land use type and the corresponding percentages are in parentheses. It shows that household farms in the Island of Rodrigues occupied more than 99% of available land falling under each main land use type when compared to non-household farms.

More details on main land use type of household and non-household farms are found at Table 17 of Appendix 2.

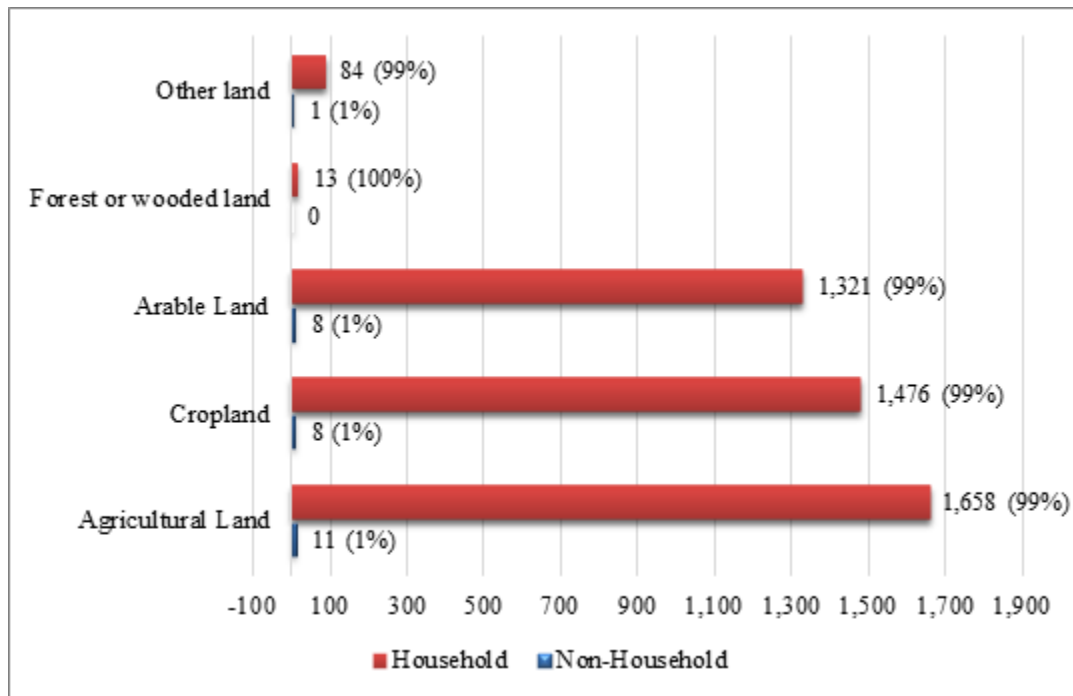


Figure 33: Comparison between household and non-household extents (ha) by main land use type, July 2013 - June 2014, IOR

4.2.6 Land extents available to household farms by main land use type and region

Figure 34 shows the extents occupied by household farmers by main land use type and region. Agricultural land, cropland and arable land are the main land use type predominating in each Region of Rodrigues Island. The maximum extent of both agricultural land, cropland arable lands were all found in La Ferme. Household farms in all regions occupied very negligible areas under forest or wooded land and other land classes. More details on land extents of household farms by main land use type and region are found at Table 18 of Appendix 2.

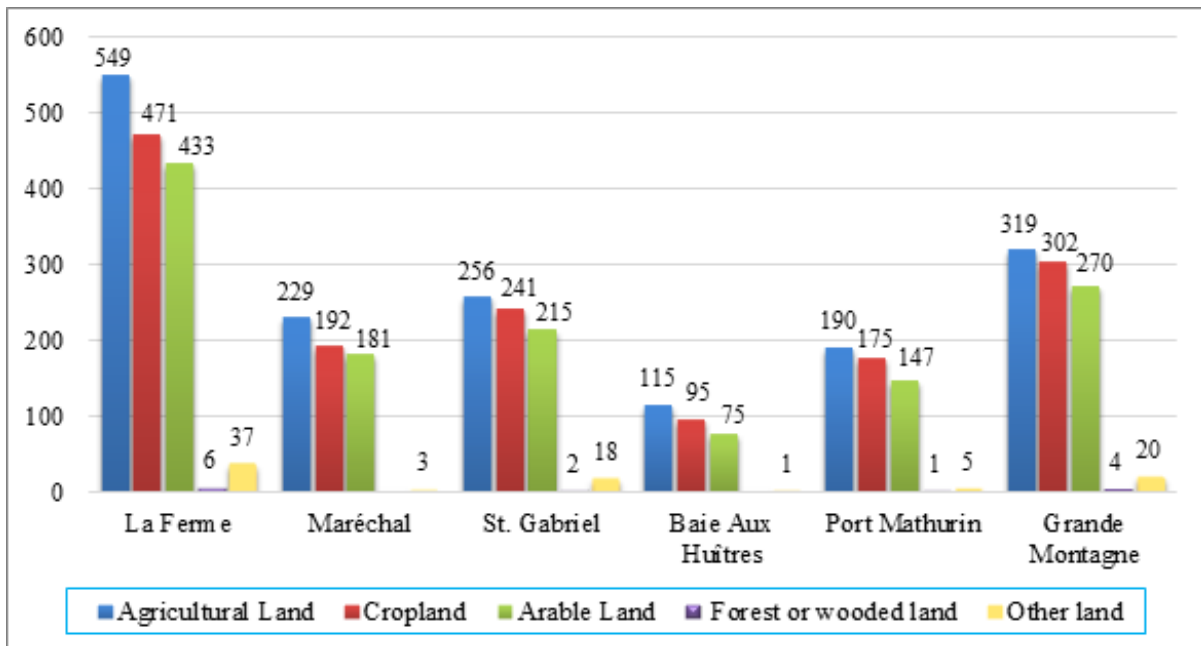


Figure 34: Extent of land of household farmers by main land use type and region, July 2013 - June 2014, IOR

Figure 35 shows the percentage of agricultural land varied from 10% to 19% in the six regions of Rodrigues. La Ferme had the highest percentage of agricultural land followed by St Gabriel, Marechal, Port Mathurin, Grande Montagne, and Baie Aux Huitres, having the lowest percentage. In the regions of La Ferme and St Gabriel, approximately 19% and 17% of each region area were occupied by household farmers as agricultural land compared to Marechal (16%), Port Mathurin (15%), Grande Montagne (13%) and Baie Aux Huitres (10%). The same trend pattern was observed for cropland and arable land (Figures 36 and 37 respectively).

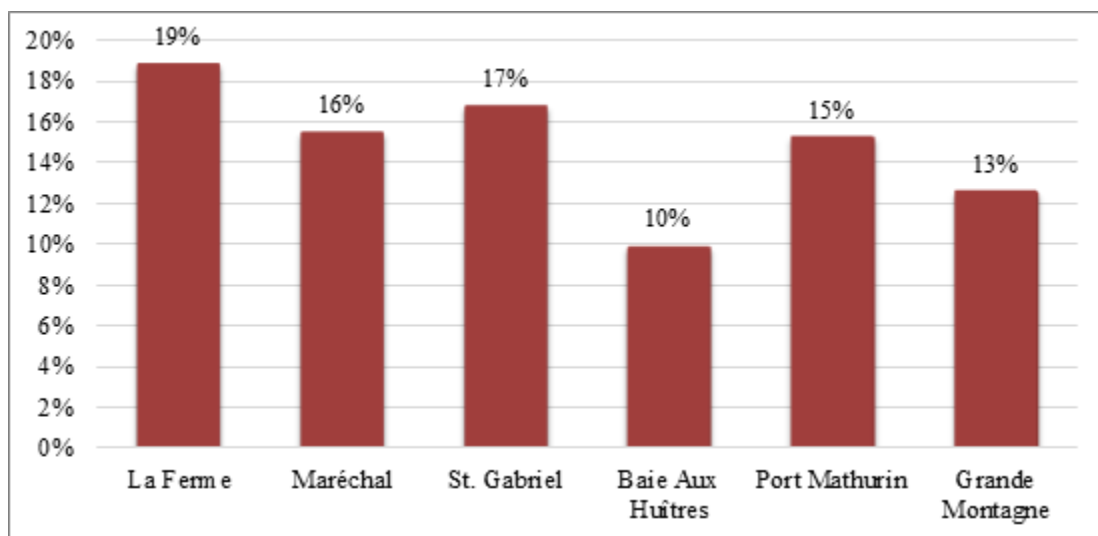


Figure 35: Agricultural extent occupied by household farms expressed as a percentage of respective region area, July 2013 - June 2014, IOR

Figure 36 indicates that 16% of the regions of La Ferme and St Gabriel comprised of cropland each while for Port Mathurin, Marechal, Grande Montagne, and Baie Aux Huitres they were 14%, 13%, 12% and 8% respectively.

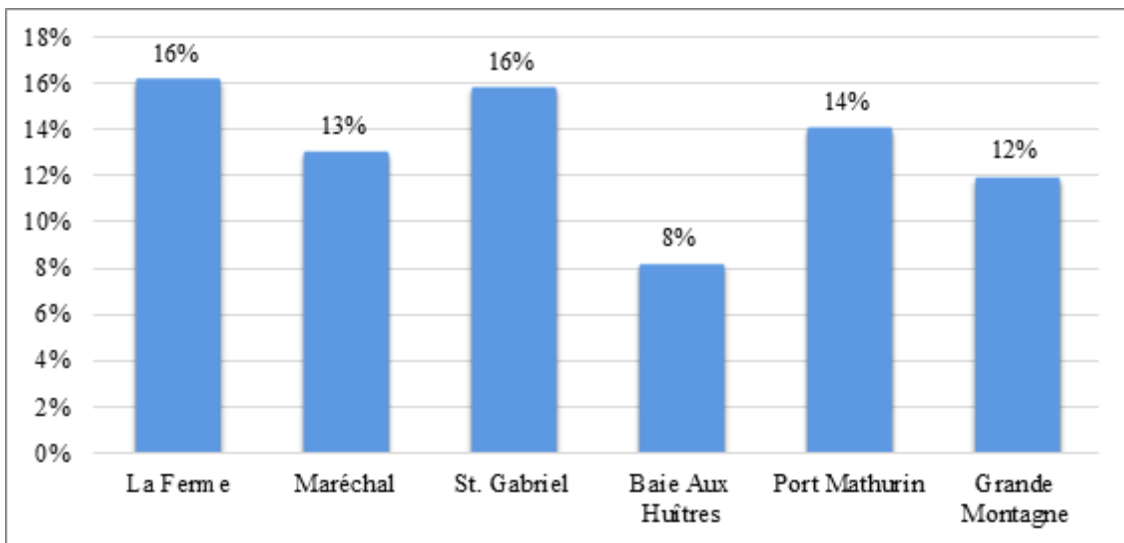


Figure 36: Cropland extent occupied by household farms expressed as a percentage of respective region area, July 2013 - June 2014, IOR

Arable land comprised 15% of La Ferme region, 14% of St Gabriel, 12% of Marechal and Port Mathurin each, 11% of Grande Montagne and only 6% of Baie Aux Huitres region as shown in Figure 37.

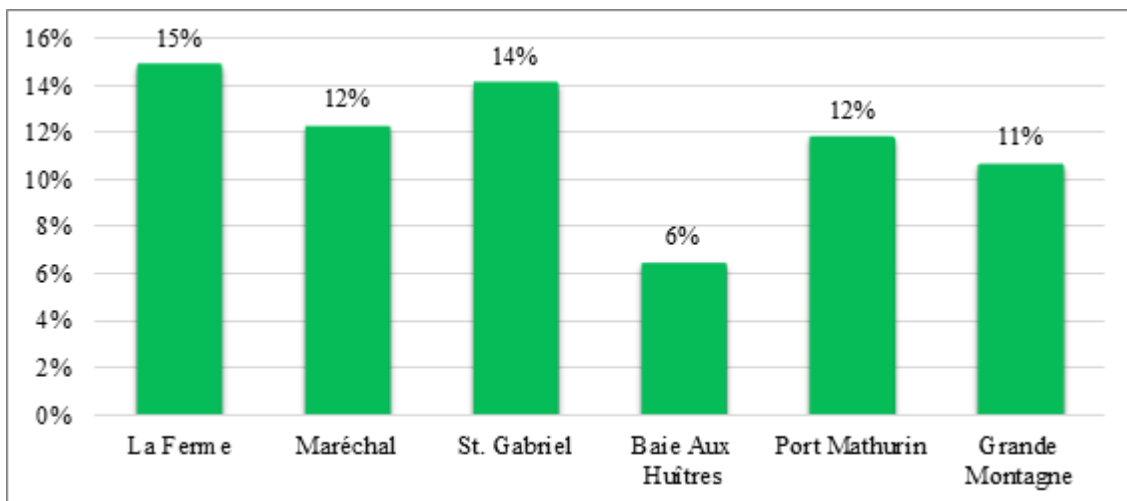


Figure 37: Arable land extent occupied by household farms expressed as a percentage of respective region area, July 2013 - June 2014, IOR

4.2.7 Average area of land for agricultural purposes per household farm

Figure 38 shows the average area per household farm. The region of La Ferme had the highest average area of land per household farm (0.50 ha), followed by the regions of Grande Montagne, Port Mathurin, Marechal and St Gabriel oscillating around 0.26-0.27 ha/farm. The region of Baie Aux Huîtres had the smallest average area per household farm of 0.18 ha.

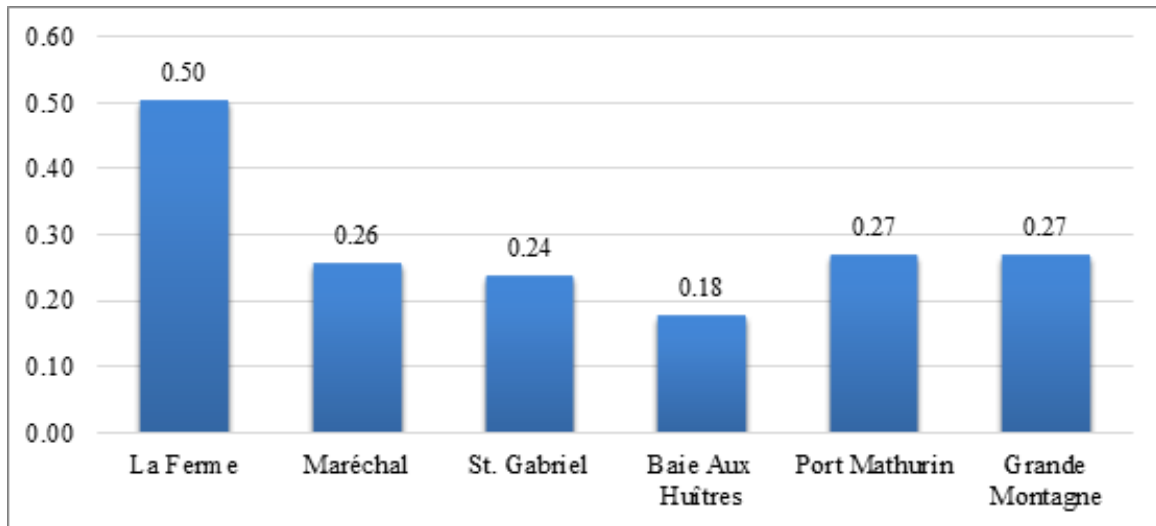


Figure 38: Average area (ha) per household farm by region, July 2013 - June 2014, IOR

4.2.8 Extent of land occupied by non-household farms by basic land use type and business ownership type

Figure 39 demonstrates how the extent of land available to non-household farms has been allocated under the basic land use types and business ownership types.

Some 56% of the total 3,026 perches available to the non-household farms were utilised by Cooperatives and 'Other' for growing temporary crops. Significant extents of the land occupied by 'Other' contained farm infrastructures and are mostly utilised for growing permanent meadows, while small extents were under permanent crops and kept as fallow land and wasteland. Companies and partnerships had most of their land under permanent meadows and pastures, while cooperatives kept a significant amount of their land fallow.

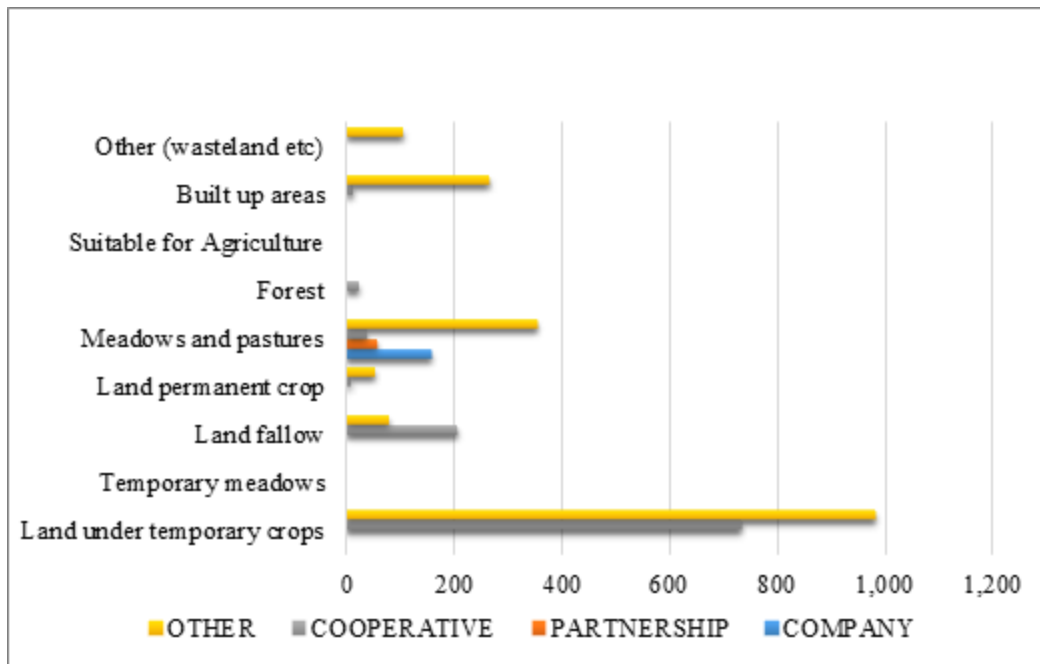


Figure 39: Area (perches) utilised by non-household farms by basic land use type and business ownership type, July 2013 - June 2014, IOR

Overall, most of the total 3,026 perches of available lands to non-household farms were shared between cooperatives (33%) and ‘Other’ type of business ownership (60%) as shown in Figure 40. Meanwhile, companies and partnerships occupied only 5% and 2% respectively of the total area.

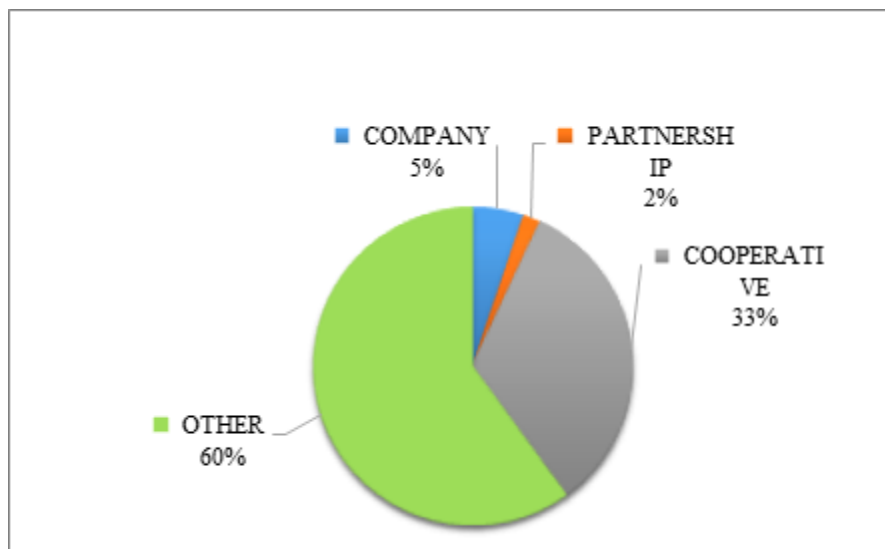


Figure 40: Percentage of total land area utilised for agricultural purposes by business ownership type, July 2013 - June 2014, IOR

4.2.9 Land area utilised by non-household farms by main land use type and business ownership type

Regarding main land use as shown in Figure 41 it is obvious that cooperatives and others occupied most of the agricultural land, forests and other lands when compared to the remaining types of business ownership.

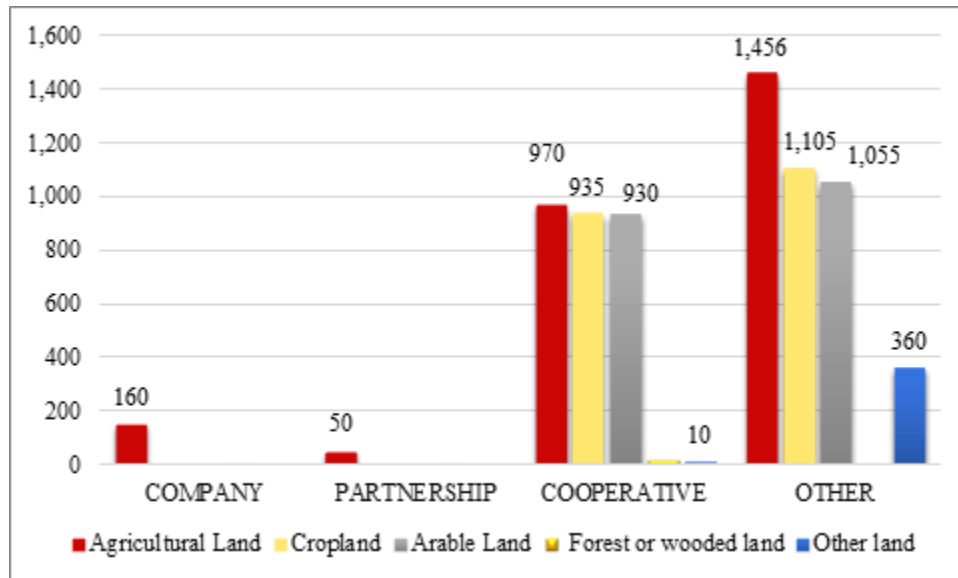


Figure 41: Area (perches) utilised by non-household farms by main land use type and business ownership type, July 2013 - June 2014, IOR

Figure 42 shows that 92% of agricultural lands in the non-household sector were occupied by both Cooperatives and “Other types of business ownership” while the remaining lands were utilised by companies (6%) and partnerships (2%).

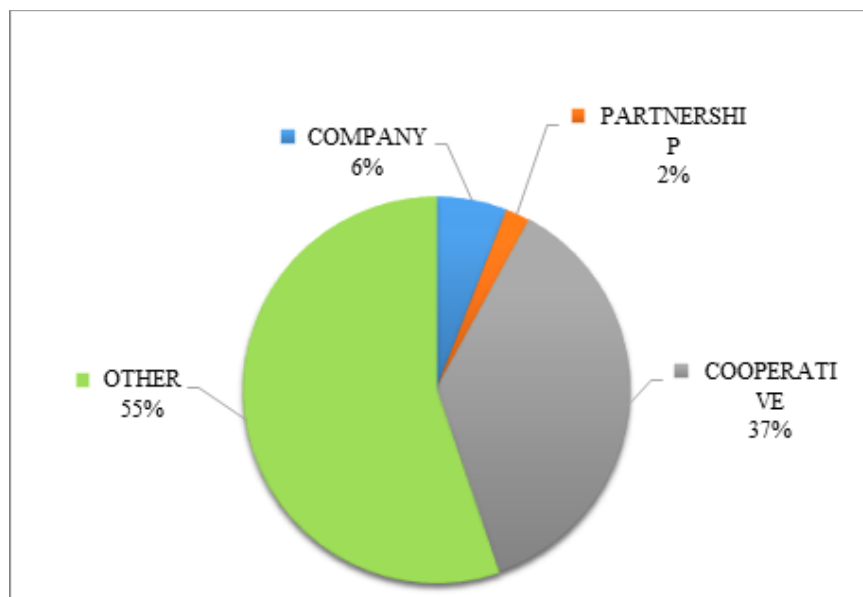


Figure 42: Percentage of agricultural land area utilised by type of business ownership, July 2013 - June 2014, IOR

4.2.10 Distribution of land parcels operated by household farms by Region

Figure 43 shows that household farmers in the region of Grande Montagne (26%) operated the highest number of land parcels for agricultural production, followed by St. Gabriel (21%), La Ferme (18%), Marechal (15%), Port Mathurin (11%) and Baie Aux Huitres (9%). More details on land parcels of household farms by region are found at Table 19 of Appendix 2.

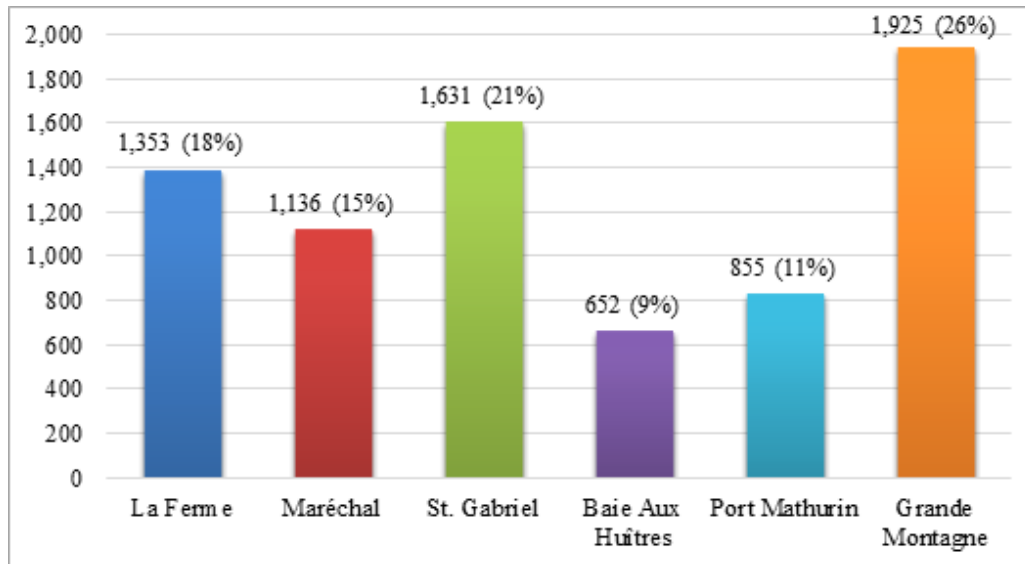


Figure 43: Distribution of land parcels of household farms by Region, July 2013 - June 2014, IOR

4.2.11 Average area per parcel operated by household farms by Region

Figure 44 shows that, on average, household farms operated much less than 0.5 ha of agricultural land per parcel in all regions ranging from 0.17 ha to 0.43 ha. The region of La Ferme had the highest average land area per parcel of 0.43 ha, while St Gabriel and Baie Aux Huitres had each the smallest area of 0.17 ha.

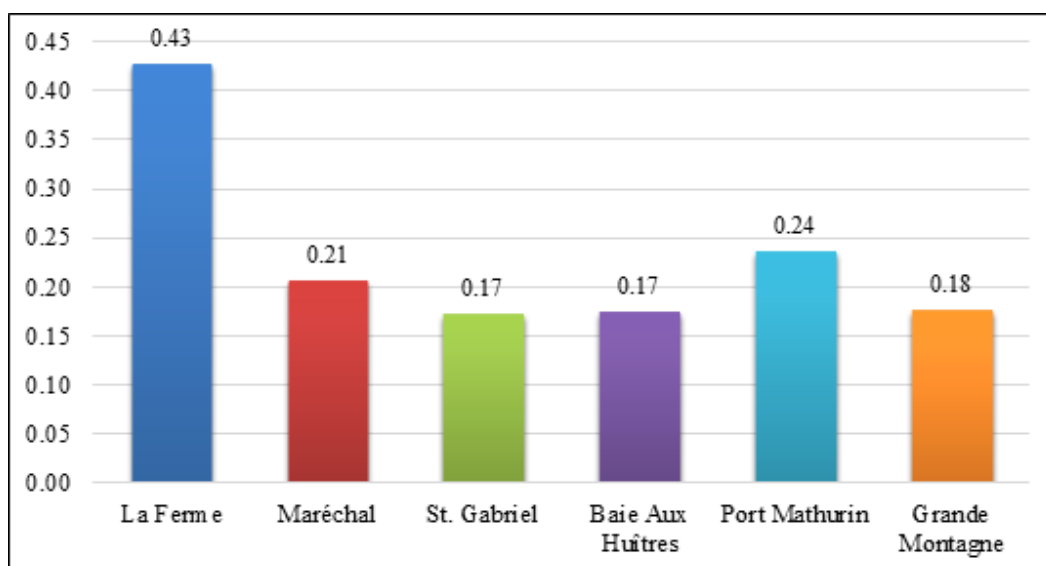


Figure 44: Average area (ha) per land parcel operated by household farms by district, July 2013 - June 2014, IOR

4.2.12 Average number of parcels per household farm by Region

Figure 45 shows the average number of land parcels occupied per household farm by region ranged from 1.02 to 1.52. The average value exceeds one in all regions; however, the regions of Grande Montagne and St Gabriel had the highest average number of land parcels per household farm, which was an around one and a half parcel per farm.

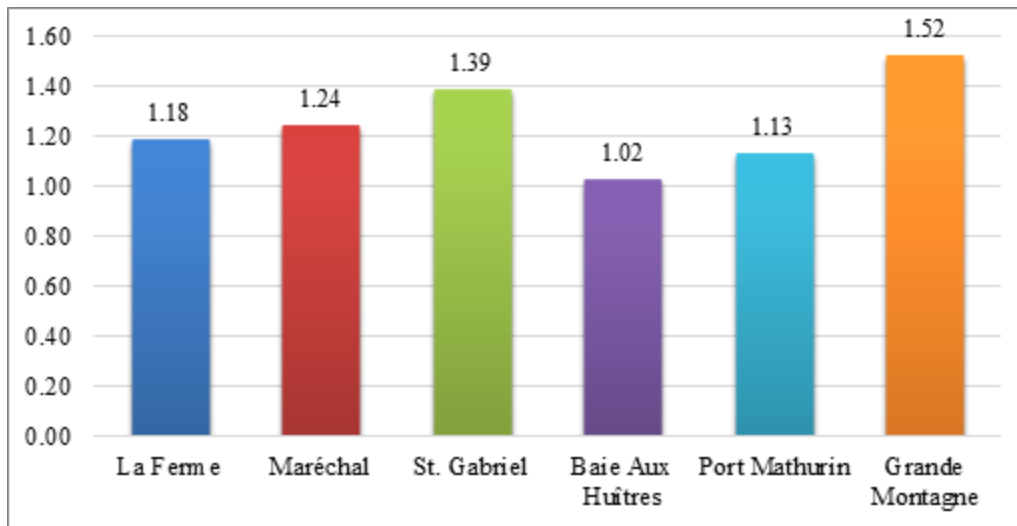


Figure 45: Average number of land parcels per household farm by Region, July 2013 - June 2014, IOR

4.2.13 Number of land parcels operated by household farms by size

Land parcels in the range of 5-24 perches was the most dominating size in Rodrigues with 1,810 parcels representing 30% of the total number of land parcels (Figure 47). Other most preferred land sizes were 50-74 perches (18%), 100-149 perches (17%) and 25-49 perches (16%). While parcel land size over 1000 perches was completely inexistent, only 3 parcels fell in the range 500-1000 perches in the Island of Rodrigues. More details on land parcels of household farms by size are found at Table 19 of Appendix 2.

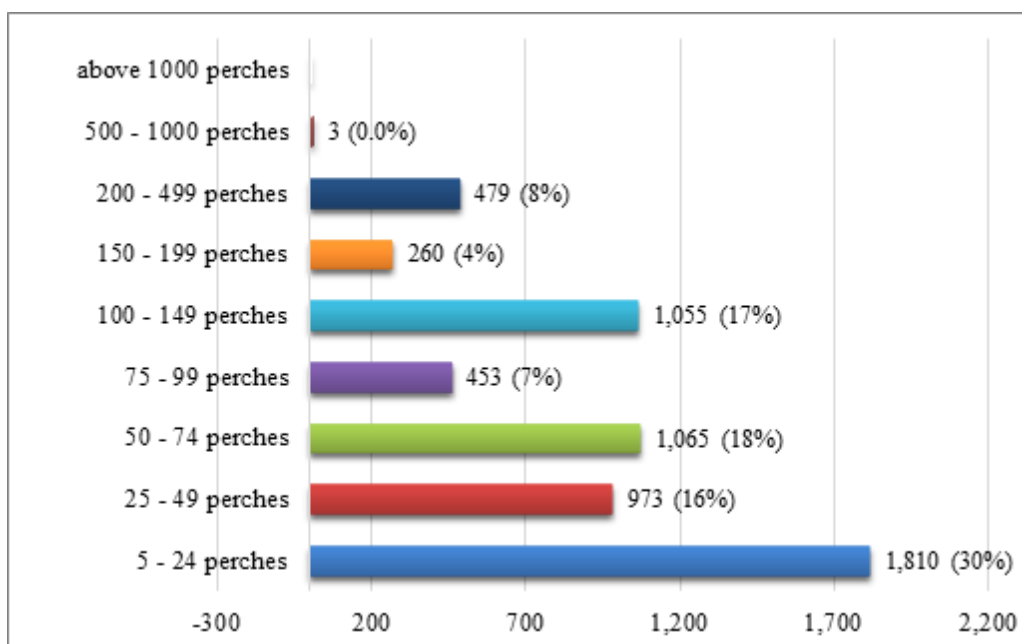


Figure 46: Distribution of land parcels of household farms by size, July 2013 - June 2014, IOR

4.2.14 Number of land parcels operated by household farms by Size and Region

Figure 47 shows that the highest number of land parcels belonged to the range of 5-24 perches in all regions of Rodrigues with the exception of La Ferme. However, the highest number of this parcel size range was found in both regions of St Gabriel and Grande Montagne. Higher size range of 100-149 perches was dominant in the region of La Ferme.

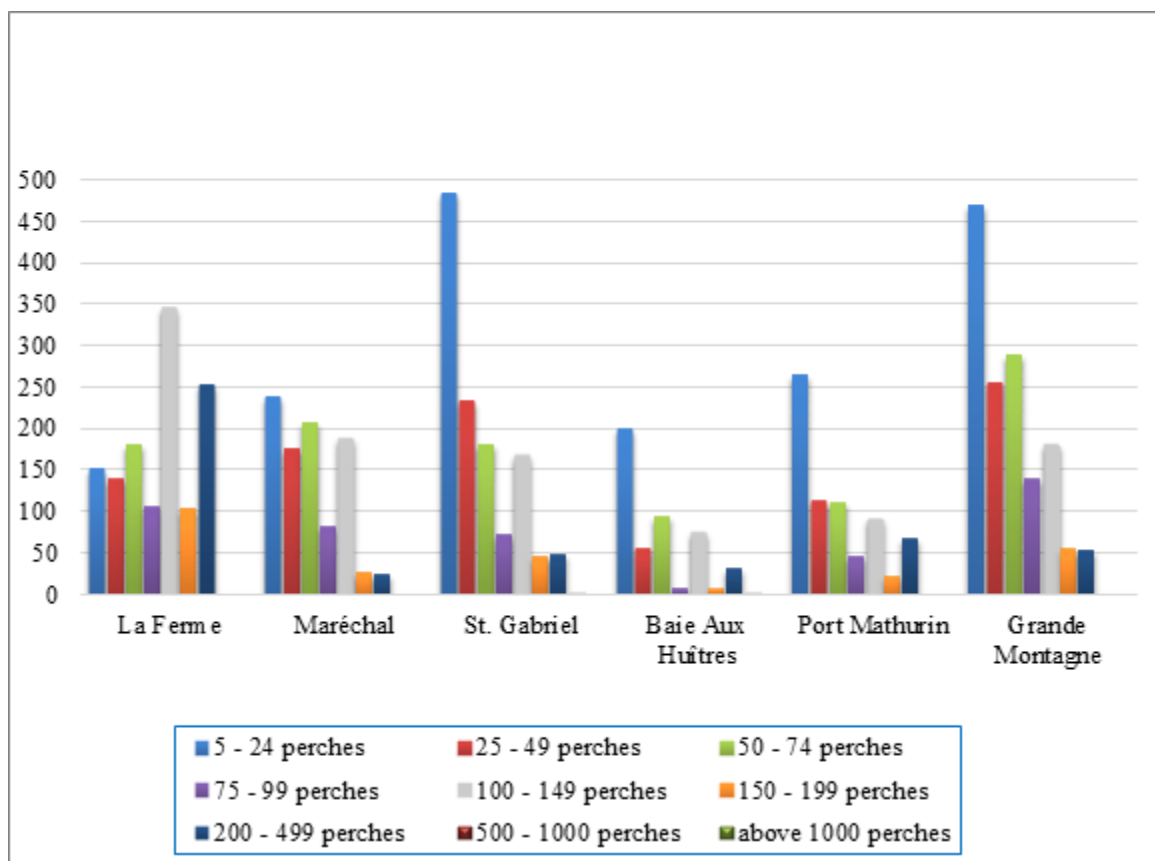


Figure 47: Distribution of land parcels of household farms by Size and Region, July 2013 - June 2014, IOR

4.2.15 Total area of parcels of household farms by Region

Figure 48 shows that household farmers in the region of La Ferme utilised the greatest land area (592 ha or 34%) of total areas of all land parcels for agricultural activities. This was followed by the region of Grande Montagne (343 ha or 19%), St Gabriel (276 ha or 16%), Marechal (232 ha or 13%), Port Mathurin (196 ha or 11%) and Baie Aux Huitres (116 ha or 7%). More details on area of land parcels of household farms by size and region are found at Table 20 of Appendix 2.

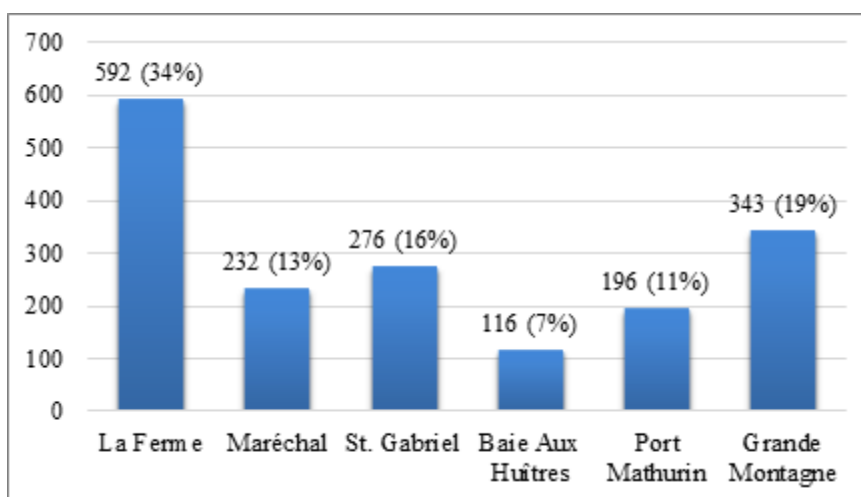


Figure 48: Distribution of total area (ha) of land parcels operated by household farms by Region, July 2013 - June 2014, IOR

4.2.16 Percentage of region area operated by household farms by Region

The percentage of each region area utilised by household farms for agricultural purposes ranged from a minimum of 10% for Baie Aux Huîtres to a maximum of 20% for La Ferme as shown in Figure 49. This was followed by 18% for St Gabriel, 16% for Marechal and Port Mathurin each and 14% for Grande Montagne.

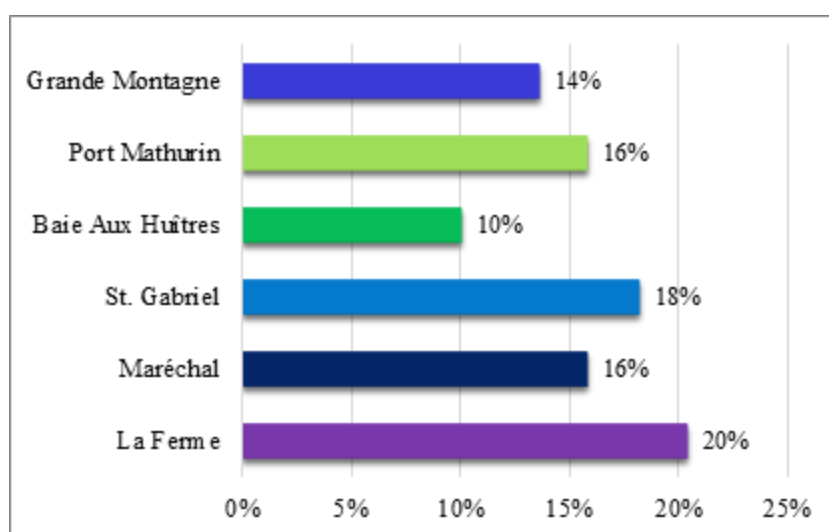


Figure 49: Percentage of region area operated by household farms by Region, July 2013 - June 2014, IOR

4.2.17 Distribution of area of land parcel of household farms by size and region

Figure 50 shows that the region of La Ferme had the highest total land area in the range of 200-499 perches as well as for 100-149 perches. These parcel sizes and 50-74 perches as well as 150-199 perches ranges were also popular in the remaining regions in the Island of

Rodrigues. Only the region of La Ferme had the highest total area in the high range 500-1000 perches.

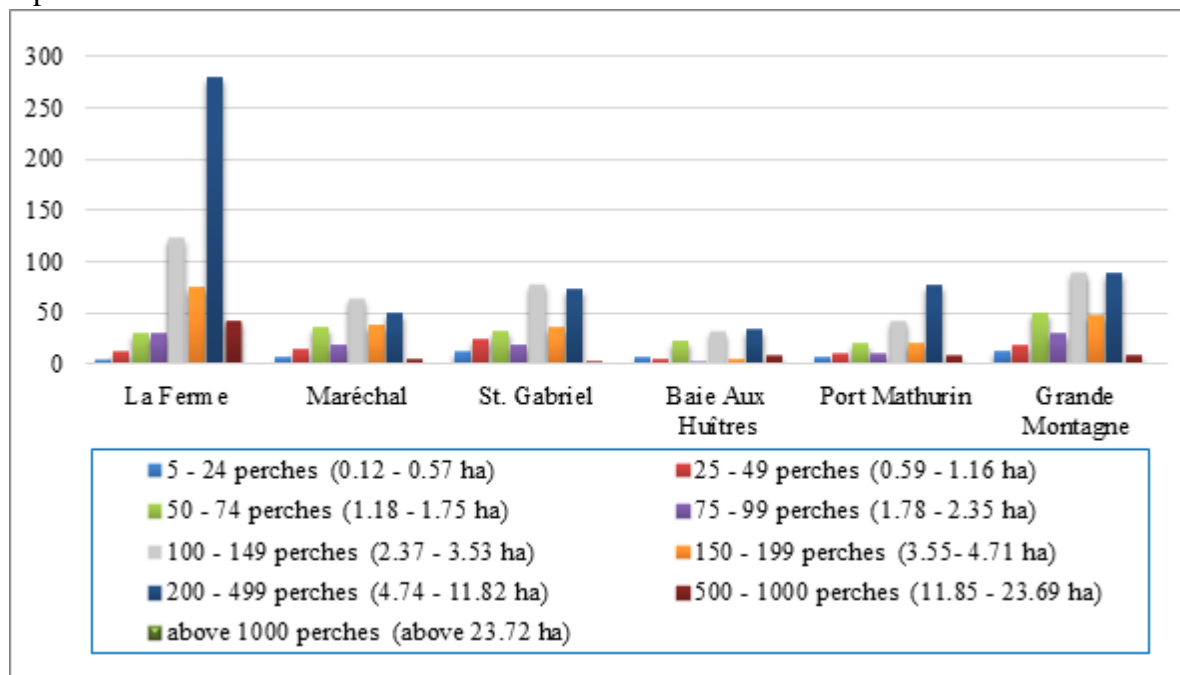


Figure 50: Area of land parcels of household farms by Size and Region, July 2013 - June 2014, IOR

4.2.18 Distribution of household farmers by parcel size

Figure 51 shows that around 22% of the household farmers in the Island of Rodrigues possessed land parcels in the range of 5-24 perches while 20% exploited those in the range of 100-149 perches. These were closely followed by 18% and 13% for the ranges 50-74 perches and 25-49 perches respectively. Some 7% of household farmers utilised land in the ranges of 75-99 perches and 150-199 perches each. Only 1% of household farmers had parcels of size 500-1000 perches. No farmers possessed parcels over 1000 perches. More details on household farmers by parcel size are found at Table 21 of Appendix 2.

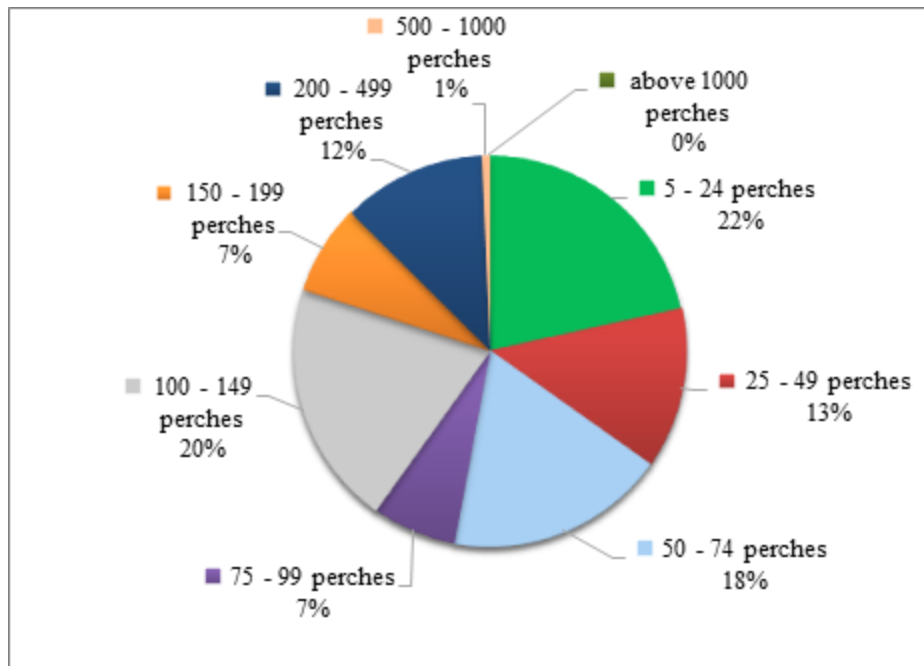


Figure 51: Distribution of household farmers by parcel size, July 2013 - June 2014, IOR

4.2.19 Distribution of household farmers by parcel size and region

Figure 52 shows that the number of household farmers exploiting a particular size range varies considerably among regions. La Ferme had two parcel size ranges, namely 100-149 perches and 200-499 perches, utilised by the greatest number of household farmers. However, 5-24 perches parcels were occupied by the highest number of household farmers in the regions of St Gabriel, Baie Aux Huîtres, Port Mathurin and Grande Montagne. A high number of farmers also had parcels in the size range 50-74 perches and 100-149 perches in the regions of Grande Montagne, St Gabriel and Marechal. More details on household farmers by parcel size and region are found at Table 21 of Appendix 2.

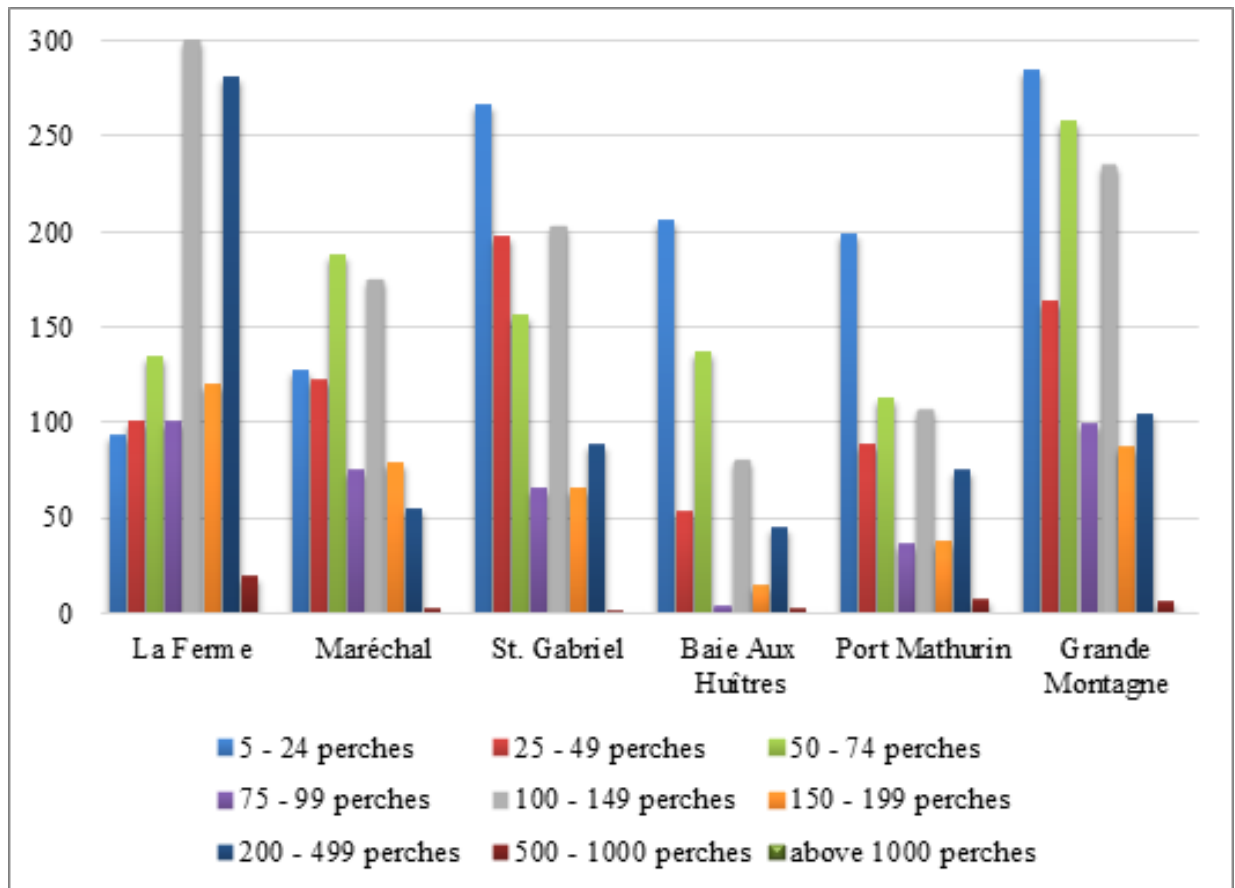


Figure 52: Distribution of household farmers by parcels size and region, July 2013 - June 2014, IOR

4.2.20 Number of household farmers occupying land parcels by region

Figure 53 shows that out of the total number of household farmers, approximately 20% of them in the Island of Rodrigues exploited land parcels in each of the regions of Grande Montagne, La Ferme and St Gabriel. They were closely followed by Marechal (15%), Port Mathurin (12%) and Baie Aux Huîtres (11%). More details on household farmers by parcel size and region are found at Table 21 of Appendix 2.

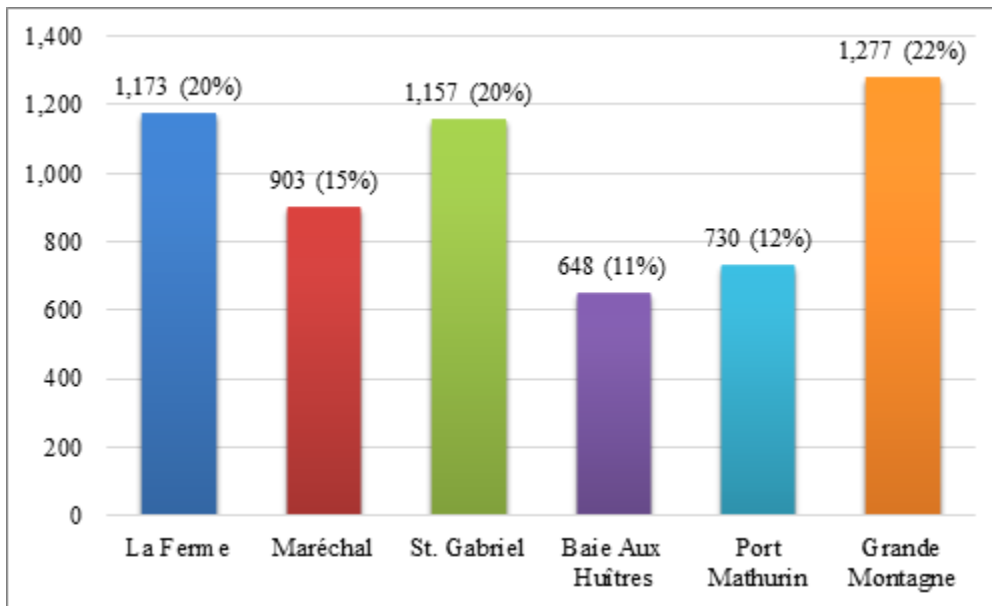


Figure 53: Number of household farmers occupying land parcels by Region, July 2013 - June 2014, IOR

4.2.21 Land area by land tenure type

Figure 54 shows that only 2 hectares of land were owned by businesses. However, 83% of the agricultural land in Rodrigues was leased from the Government by non-household farms.

In the household category Figure 55 indicates that 108 ha (or 6%) of land was owned while approximately 812 ha representing 46% was leased from the government. Some 28 ha (2%) were rented/leased from others. A total area of 807 ha (or 46%) fell under the other types of land tenure. More details on area by tenure type and sector are found at Table 22 of Appendix 2.

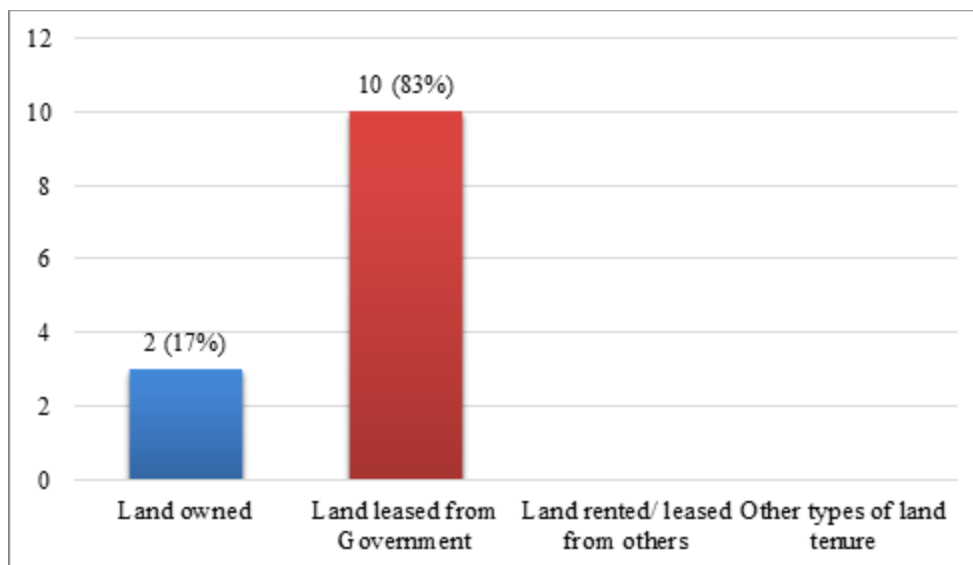


Figure 54: Land areas (ha) by land tenure type (non-household sector) July 2013 - June 2014, IOR

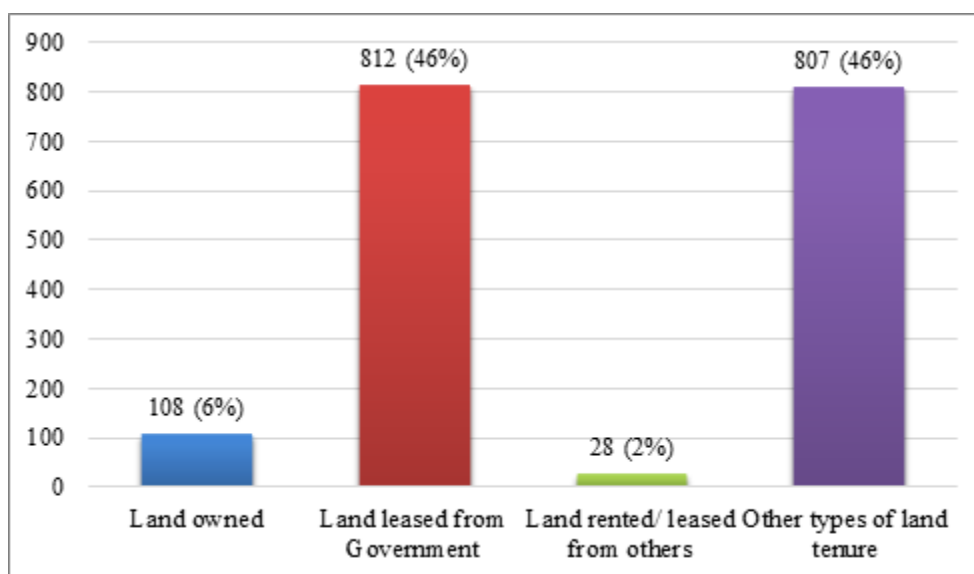


Figure 55: Land areas (ha) by land tenure type (household sector), July 2013 - June 2014, IOR

4.2.22 Distribution of area of household farms by tenure type and region

Figure 56 shows that all regions had significant amount of land leased from Government as well as other types of land tenure. La Ferme had the highest amount of both land leased from Government and other types of land tenure. St Gabriel and Grande Montagne had almost the same amount of these two land tenure types. Each of the regions had very small proportions of land owned for agricultural purposes. Land rented or leased from others represented a negligible amount in each region. More details on area by tenure type (household sector) are found at Table 23 of Appendix 2.

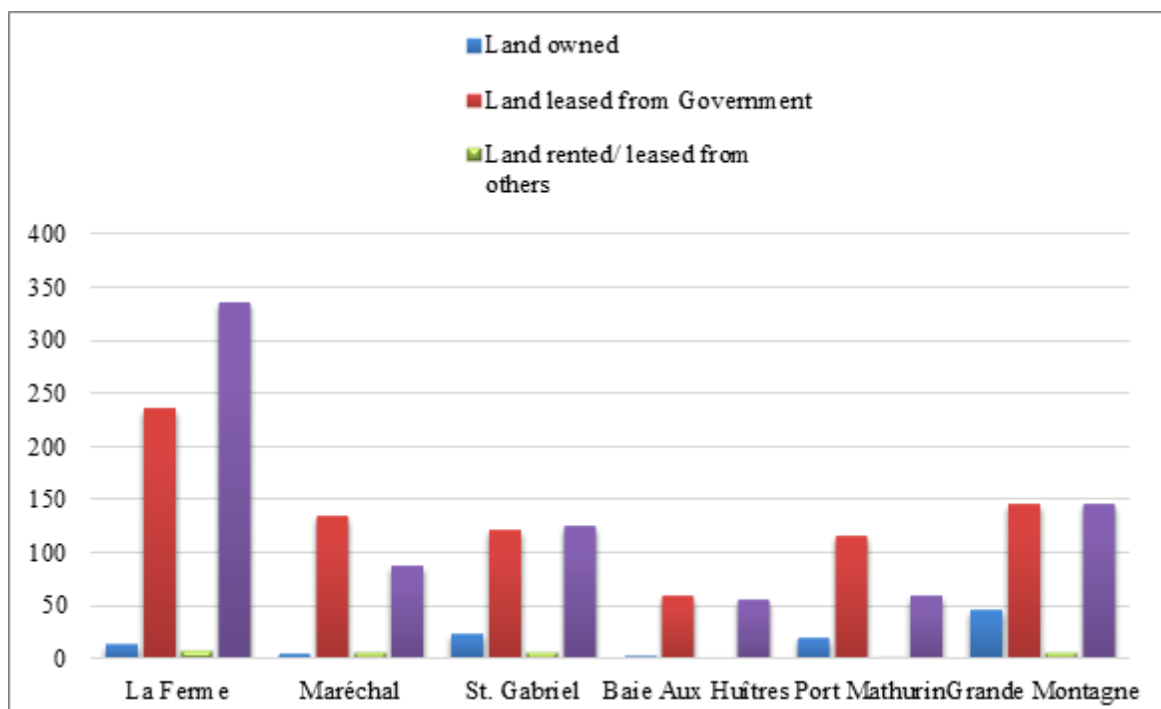


Figure 56: Distribution of Land areas (ha) by land tenure type and region (household sector), July 2013 - June 2014, IOR

4.2.23 Land rented to others, July 2013 - 30 June 2014

Household farms rented a total of 10 hectares of their agricultural lands to others whereas businesses did not rent any.

4.3 GENERAL TREND IN AGRICULTURAL LAND EXTENT

Some of the available past agricultural data described in Section 2 together with the present agricultural land area obtained are shown in Table 8.

Table 8: Extent of available land for agricultural purposes, 1930 - 2014, IOM

	1930	1940	1986	1995	1996	2005	2008	2010	2011	2012	2013	2014
Area (ha)	68,010	73,670	91,574	86,500	84,424	80,674	72,933	70,501	68,114	66,126	65,252	64,680

Based on the above data, Figure 57 below was prepared to depict the trend in the variations in agricultural land area in the Island of Mauritius from 1930 to 2014. It must be highlighted that the trend line between 1941 and 1985 is shown broken to indicate the absence of reliable agricultural land data during this period.

The general increase in agricultural land area was most probably due to the clearing of forest land to expand agricultural land extent from 1940 to 1985 for the plantation of sugarcane. After 1985, due to rapid industrialisation of the country, large extent of land devoted to agriculture was used to build roads, houses and industrial buildings as well as other infrastructures.

The loss in agricultural land has continued rapidly over the last three decades, again for the construction of residential and commercial buildings to cater for the needs of the ever increasing population.

Therefore, Figure 57 clearly shows that there has been loss of agricultural land since 1985 and is still continuing through a steep decreasing trend.

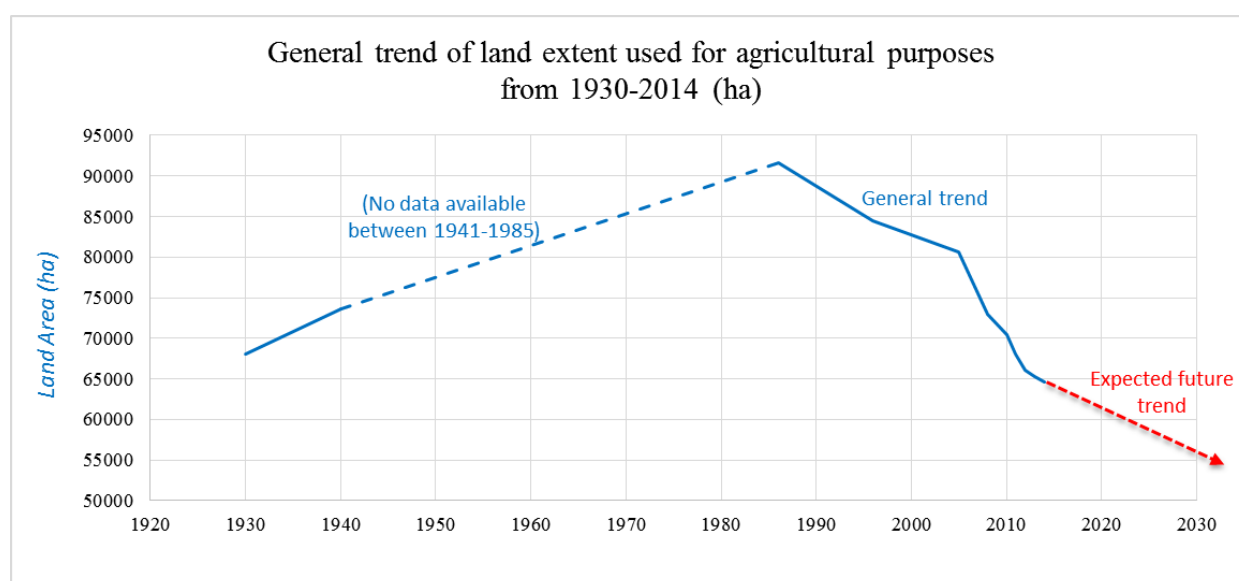


Figure 57: General trend and forecast of land extent used for agricultural purposes, 1930-2030, IOM

5 CONCLUSION AND RECOMMENDATIONS

5.1 ISLAND OF MAURITIUS

(i) The amount of agricultural land area recorded by the present census, including areas under sugarcane and tea, in the Island of Mauritius, works out to approximately 83,000 ha compared to a figure of 74,000 ha of the 1940 census.

(ii) Due to agricultural census data availability gap over several decades, i.e. from 1940 to 2014, it is very difficult to rely on this percentage reduction in agricultural land area to draw valid conclusion since extensive forest areas were cleared for both agricultural and residential purposes during the past 70 years. It may be safely inferred, however, that the decrease in forest area over the last 70 years was released land to be used for purposes other than agriculture.

(iii) Some three quarters of currently available land for agricultural purposes were utilised for the cultivation of temporary and permanent crops, while 5% were devoted for meadows and pastures. Around one tenth of the unutilised land areas may be exploited for agricultural production, etc., after careful assessments.

(iv) Both individuals and businesses were more dedicated to the cultivation of both temporary and permanent crops and less towards growing of meadows and pastures. The significant percentage of built up areas for non-household farms is clear evidence that considerable land areas were required for construction of farm infrastructures for commercial use.

(v) Some 80% of the available agricultural lands as well as croplands were occupied by businesses. This is obvious as non-household farms had the required capital and equipment to cultivate over large extent of agricultural land when compared to household farms. However, the latter occupied more than 60% of arable land for cultivation of temporary crops and growing of temporary meadows and pastures.

(vi) Overall, it is clear that businesses were more geared towards exploitation of permanent crops when compared to household farms who were more devoted for temporary crops as well as permanent crops cultivations. When management of forest land is compared between businesses and household farms, the latter seems very much less interested in this type of land use activity.

(vii) The maximum extent of both agricultural land and cropland was found in the district of Flacq followed by Pamplemousses and Plaines Wilhems, most probably because of their almost flat topography. Despite being the third largest district in Mauritius, Black River was least occupied in terms of agricultural activities which may be due to its very undulating and hummocky topography.

(viii) In the non-household sector, companies occupied more than 95% of the agricultural lands, forests and other lands when compared to the other types of businesses. Cooperatives occupied a negligible amount of arable land and cropland.

(ix) Household farms had around 32,000 land parcels ranging from 5 perches (0.1 ha) to over 1000 perches (>23 ha). Most of the land parcels were found in the districts of Flacq (24%)

and Pamplémousses (21%). It has been found that household farmers in the districts of Moka and Pamplémousses had approximately two parcels of land per household farm. However, the district of Plaines Wilhems had the highest average area of 0.6 ha per land parcel.

(x) The size ranges of 200-499 perches and 5-24 perches were more common among household farms as they represented 25% and 17% respectively of the total number of land parcels. Most of the land parcels were found below 500 perches which may be due to the fact that small land parcels require less investment and can be easily afforded by household farmers.

(xi) The districts of Pamplémousses and Flacq had the highest number of land parcels in the range of 200-499 perches. However, the district of Plaines Wilhems contained the highest land extents in the range over 1000 perches while same for Pamplémousses and Flacq lies in the size range 200-499 perches. Most of the household farms had land parcels in the range of 5-24 perches and 200-499 perches.

(xii) In the non-household sector, around 95% of the exploited agricultural lands were owned by businesses, while the remaining areas were leased/rented. Household farms owned 46% of the total extent they occupied while 41% were leased/rented from Government and others. In terms of total areas occupied by household and non-household sectors, more than 80% was being exploited by non-household farms. This means that businesses had more capital and facilities to invest massively in agricultural production over larger areas of land compared to household farmers. Businesses are profit-oriented while household farms worked for monthly subsistence and survival. It is a fact that household farmers lack capitals and facilities to invest in large parcels of lands.

(xiii) Most of lands owned by household farms were found in the districts of Flacq, Pamplémousses and Plaine Wilhems.

(xiv) Of the total areas of land rented/leased from others, around 92% were rented/leased by household farmers compared to business holdings. This signifies that most of the household farmers who rented lands may be depending very much on agriculture to earn their living.

(xv) Around 300 hectares of land fell under the other types of land tenure category. Most of this land was either being squatted on or occupied without owner's consent by household farmers.

(xvi) Approximately 90% of the total land area rented to others were owned by businesses while the rest belonged to household farmers. Again, this proves that businesses possessed an excess of agricultural lands which they rented to others.

(xvii) Agricultural lands have been decreasing considerably over the past three decades due to rapid industrialisation of the country and the creation of new pillars other than related to agriculture in order to support our economy.

5.2 ISLAND OF RODRIGUES

(i) Past agricultural census data for Rodrigues Island are not available for comparison purposes. As such, it would be very difficult to detect changes in agricultural land use pattern. Hence, the results collected will only be summarised.

(ii) Three quarter of available agricultural lands on the Island of Rodrigues were under food crop production. Some 12% of available agricultural land comprising fallow land, land suitable for agriculture and other land category may be exploited for agricultural purposes to increase food production.

(iii) Rodrigues also had more land parcels areas in the range of 5-24 square perches. Once more, this shows that small parcels were most common among household farms.

(iv) Most of the number of land parcels were found in the region of Grande Montagne (26%) and St. Gabriel (21%). Both regions had the highest number of land parcels in the range of 5-24 perches. However, the region of La Ferme had the highest number of land parcels in the range of 100-149 perches. Size range exceeding 500 perches were almost inexistent.

(v) La Ferme region contained a large share, around 34%, of the total extent of land available for agricultural purposes in the Island of Rodrigues. Again, this region had also the greatest total area of land parcels in the range of 200-499 perches. In addition, 20% of its total area was devoted to agricultural activities followed closely by St Gabriel with 18%.

(vi) In the Island of Rodrigues, only 6% of all agricultural land was privately owned. Most of the agricultural lands leased or rented to businesses and individual farmers belonged to the Government. A large percentage (46%), however, was occupied illegally either through squatting or without owner's consent by household farmers.

(vii) Compared to Mauritius, 90% of all land rented to others belonged to household farmers in Rodrigues. This situation may have risen due to the incapacity of the land owners to invest in food crop production.

6 RECOMMENDATIONS

(i) Urgent actions must be undertaken in order to brake and reverse the trend in loss of agricultural land in Mauritius for food security purposes.

(ii) Farms with fragmented land arrangement are formed due to land reform policies and expansion of land market in rural areas. Other factors are inheritance between several children in a family, a parcel belonging to more than one owner or there are dual or multiple ownership.

There are a lot of problems associated with land fragmentation. It prevents rational agricultural development and also hinders sustainable rural development. Lack of road access to certain areas, increasing expenses of transport works, issues related to ownership rights and inefficient production are some of the problems associated with a high degree of land fragmentation.

Based on the average number of parcels per household result obtained, a land fragmentation analysis would have revealed if the existing land tenure structure is problematic and if it requires attention for land consolidation policies to be adopted in order to optimize land use.

A recent method developed by Demetriou *et al.* (2013) to determine land fragmentation indexes takes into account the following factors:

- Dispersion of parcels
- Size of parcels
- Shape of parcels
- Accessibility of parcels
- Dual ownership
- Shared ownership

Data on many of the above factors were not included in the present Census questionnaire. As such, a land fragmentation analysis could not be performed.

It is therefore most recommended that necessary steps be taken in order to include the above required information in the next survey or census questionnaires related to agriculture.

(iii) Data regarding expenditure for long-term investment in land quality improvement as well as for improving agricultural infrastructures (such as canal maintenance, irrigation networks and accessories, terracing and land levelling), were also not included in the present Census questionnaire. Thus, it has been impossible to determine farmer's willingness to invest in these areas which are pre-requisites in promoting sustainable agricultural and rural development. This would have allowed decision and policy makers direct funding assistance or ease access to capital to needy farmers towards these agricultural development areas.

7 REFERENCES

1. FAO, 2005, *World Programme for the Census of Agriculture 2010 FAO STATISTICAL DEVELOPMENT SERIES No. 11, A system of integrated agricultural censuses and surveys*, Volume 1.
2. Koenig, M 1930, *Agricultural Census 1930*, Colony of Mauritius.
3. Koenig, M 1940, *Agricultural Census 1940*, Colony of Mauritius.
4. National Parks and Conservation Service, 2007, *CBD Strategy and Action Plan – Mauritius*. National Parks and Conservation Service, Ministry of Agro Industry and Fisheries, Viewed 04 December 2015, <<http://npcs.govmu.org/English/Legislation/Documents/mu-nbsap-01-en.pdf>>.
5. FAO, 2015, *Land Resources*, Viewed 04 December 2015, <<http://www.fao.org/nr/land/use/en/>>.
6. Mauritius Meteorological Services, 2010, *Second National Communication of the Republic of Mauritius under the United Nations Framework Convention on Climate Change (UNFCCC)*, Mauritius Meteorological Services, Republic of Mauritius, Viewed 04 December 2015, <<http://unfccc.int/resource/docs/natc/musnc2.pdf>>.
7. Chung Tze Cheong, M, Ramasamy, S & Adelaide, S 2011, ‘The 2010 Land use map of Mauritius’, *MSIRI Occasional Paper No. 41*, Mauritius Sugar Industry Research Institute, Reduit, Viewed 04 December 2015, <http://www.msiri.mu/UserFiles/File/2010_Land_use_of_Mauritius.pdf>.
8. Demetriou, D, Stillwell, J & See, L 2013, ‘A new methodology for measuring land fragmentation’, *Computers, Environment and Urban Systems*, Vol. 39, pp. 71 - 80.
9. Dace, P 2010, ‘Analysis of land fragmentation in rural areas’, *Research for Rural Development - International Scientific Conference*, Vol. 2, p. 110.
10. Januszewski, J 1968, Index of land consolidation as a criterion of the degree of concentration, *Geographia Polonica*, Vol 14, pp. 291-296.
11. City Population, 2015, *Mauritius, Republic of Mauritius*. Viewed 04 December 2015, <<http://www.citypopulation.de/Mauritius.html>>.
12. Saddul, P (ed.) 2015, *Atlas of Mauritius, 2015 Edition*, Editions de l’Ocean Indien. Rose-Hill, Mauritius.
13. Trading Economics, 2015, *Land area (sq. km) in Mauritius*, Viewed 04 December 2015, <<http://www.tradingeconomics.com/mauritius/land-area-sq-km-wb-data.html>>.
14. Statistics Mauritius, 2009, *Digest of Agricultural Statistics, 2008*, Statistics Mauritius, Port Louis.
15. Statistics Mauritius, 2012, *Digest of Agricultural Statistics, 2011*, Statistics Mauritius, Port Louis.
16. Statistics Mauritius, 2015, *Digest of Agricultural Statistics, 2014*, Statistics Mauritius, Port Louis.
17. Statistics Mauritius, 2009, *Digest of Environment Statistics 2008*, Statistics Mauritius, Port Louis.
18. Statistics Mauritius, 2012, *Digest of Environment Statistics 2011*, Statistics Mauritius, Port Louis.
19. Statistics Mauritius, 2013, *Digest of Environment Statistics 2012*, Statistics Mauritius, Port Louis.

20. Ministry of Agro Industry and Food Security, 2015, *Fifth National Report on the Convention on Biological Diversity - April 2015*, Ministry of Agro Industry and Food Security, Republic of Mauritius.

APPENDIX 1: CA2014 Results, IOM

Table 9: Land use by sector, July 2013 - June 2014, IOM

Land use type	Non-Household Sector (ha)	%	Household Sector (ha)	%	Both Sectors (ha)	%
Land under temporary crops	2,748	5.1	5,769	51.3	8,517	13.2
Land under temporary meadows and pastures	617	1.2	88	0.8	705	1.1
Land fallow	339	0.6	202	1.8	541	0.8
Land under permanent crops	36,860	69.0	3,931	34.9	40,791	63.1
Land under permanent meadows and pastures	1,774	3.3	530	4.7	2,304	3.6
Forest or wooded land	4,942	9.3	169	1.5	5,111	7.9
Suitable for agriculture	3,441	6.4	202	1.8	3,643	5.6
Built up areas	1,508	2.8	39	0.3	1,547	2.4
Other land (e.g wasteland, land under water,etc)	1,199	2.3	324	2.9	1,523	2.3
All types	53,428	100.0	11,254	100.0	64,682	100.0

Source: 2014 Census of Agriculture

Table 10: Extent of lands occupied by household farms by main land use type and district, July 2013 – June 2014, IOM

(Hectares)

Main Land Use Type	Port Louis	Pamplemousses	Riviere du Rempart	Flacq	Grand Port	Savanne	Plaine Wilhems	Moka	Black River	All Districts
Agricultural Land	152	1,900	1,033	2,271	1,001	996	1,659	1,398	110	10,520
Cropland	129	1,874	996	2,220	991	984	1,631	1,090	74	9,989
Arable Land	96	997	690	1,132	710	497	1,193	702	43	6,060
Forest or wooded land	-	3	2	41	-	120	3	-	-	169
Other land	4	105	29	80	8	54	254	13	19	566

Table 11: Distribution of land parcels by Size and District (Household Sector), July 2013 - June 2014, IOM

Parcel size	Port Louis	Pamplemousses	Riviere du Rempart	Flacq	Grand Port	Savanne	Plaines Wilhems	Moka	Black River	All Districts
0 - 1 perches (0 - 0.02 ha)	112	462	473	923	260	99	120	78	157	2,684
2 - 4 perches (0.05 - 0.09 ha)	89	312	252	375	180	75	125	99	146	1,653
5 - 24 perches (0.12 - 0.57 ha)	167	625	657	1,002	581	570	473	325	266	4,666
25 - 49 perches (0.59 - 1.16 ha)	27	447	354	651	319	265	305	212	31	2,611
50 - 74 perches (1.18 - 1.75 ha)	18	557	310	888	321	136	240	232	29	2,731
75 - 99 perches (1.78 - 2.35 ha)	5	422	179	313	201	62	138	120	11	1,451
100 - 149 perches (2.37 - 3.53 ha)	25	804	535	835	432	331	430	369	9	3,770
150 - 199 perches (3.55- 4.71 ha)	16	653	218	476	214	173	216	289	20	2,275
200 - 499 perches (4.74 - 11.82 ha)	107	1,642	734	1,446	655	373	750	967	30	6,704
500 - 1000 perches (11.85 - 23.69 ha)	23	517	203	539	236	187	255	299	12	2,271
Above 1000 perches (above 23.72 ha)	9	136	56	173	68	106	160	49	9	766
All sizes	598	6,577	3,971	7,621	3,467	2,377	3,212	3,039	720	31,582

Source: 2014 Census of agriculture

Table 12: Land area by parcel size and district (Household Sector), July 2013 - June 2014, IOM*(Hectares)*

Parcel size	Port Louis	Pamplemousses	Riviere du Rempart	Flacq	Grand Port	Savanne	Plaines Wilhems	Moka	Black River	All Districts
0 - 1 perches (0 - 0.02 ha)	-	1	1	2	1	-	-	-	-	5
2 - 4 perches (0.05 - 0.09 ha)	1	3	3	4	2	1	2	1	2	19
5 - 24 perches (0.12 - 0.57 ha)	8	26	23	35	19	19	20	10	11	171
25 - 49 perches (0.59 - 1.16 ha)	4	38	28	53	22	22	29	16	4	216
50 - 74 perches (1.18 - 1.75 ha)	4	67	39	119	38	20	40	25	6	358
75 - 99 perches (1.78 - 2.35 ha)	1	64	32	58	36	9	29	21	4	254
100 - 149 perches (2.37 - 3.53 ha)	9	182	129	210	116	81	127	93	3	950
150 - 199 perches (3.55- 4.71 ha)	7	183	74	153	58	58	75	75	8	691
200 - 499 perches (4.74 - 11.82 ha)	63	707	365	746	323	197	473	457	27	3,358
500 - 1000 perches (11.85 - 23.69 ha)	36	407	216	485	253	181	290	320	21	2,209
above 1000 perches (above 23.72 ha)	23	330	154	527	141	582	831	392	43	3,023
All sizes	156	2,008	1,064	2,392	1,009	1,170	1,916	1,410	129	11,254

Source: 2014 Census of Agriculture

Table 13: Distribution of farmers by parcel size and district (Household Sector), July 2013 - June 2014, IOM

Parcel size	Port Louis	Pamplemousses	Riviere du Rempart	Flacq	Grand Port	Savanne	Plaines Wilhems	Moka	Black River	All Districts
0 - 1 perches (0 - 0.02 ha)	115	435	456	906	216	108	119	72	159	2,586
2 - 4 perches (0.05 - 0.09 ha)	87	272	239	353	150	76	125	72	144	1,518
5 - 24 perches (0.12 - 0.57 ha)	164	504	524	734	402	429	403	222	249	3,631
25 - 49 perches (0.59 - 1.16 ha)	25	286	218	428	172	158	235	133	34	1,689
50 - 74 perches (1.18 - 1.75 ha)	18	295	197	541	162	87	191	114	27	1,632
75 - 99 perches (1.78 - 2.35 ha)	4	196	98	188	106	29	82	62	11	776
100 - 149 perches (2.37 - 3.53 ha)	20	395	306	481	260	181	298	208	8	2,157
150 - 199 perches (3.55- 4.71 ha)	13	272	121	231	89	83	119	113	12	1,053
200 - 499 perches (4.74 - 11.82 ha)	59	636	335	683	288	173	446	399	35	3,054
500 - 1000 perches (11.85 - 23.69 ha)	13	163	82	195	89	66	118	112	6	844
above 1000 perches (above 23.72 ha)	4	38	21	69	28	42	67	19	6	294
All sizes	522	3,492	2,597	4,809	1,962	1,432	2,203	1,526	691	19,234

Source: 2014 Census of Agriculture

Table 14: Land area by tenure type and sector, July 2013 - June 2014, IOM*(Hectares)*

Tenure Type	Non-household Sector	Household Sector	Both sectors
Land owned	50,834	5,223	56,067
Land leased from Government	2,190	1,135	3,325
Land rented/leased from others	404	4,582	4,986
Other types of land tenure	-	304	304
All types	53,429	11,254	64,682

*Source: 2014 Census of Agriculture***Table 15: Land area by tenure type and district (Household Sector), July 2013 - June 2014, IOM***(Hectares)*

Tenure Type	Port Louis	Pamplemousses	Riviere du Rempart	Flacq	Grand Port	Savanne	Plaines Wilhems	Moka	Black River	All Districts
Land owned	83	1,131	527	1,303	344	320	917	537	72	5,234
Land leased from Government	27	83	13	287	92	27	414	163	29	1,136
Land rented/ leased from others	31	757	497	735	542	789	534	670	26	4,580
Other types of land tenure	15	37	27	67	31	34	51	40	2	304
All Types	156	2,008	1,064	2,392	1,009	1,170	1,916	1,410	129	11,254

Source: 2014 Census of Agriculture

APPENDIX 2: CA2014 Results, IOR

Table 16: Land use (basic) by Sector, July 2013 - June 2014, IOR

(Hectares)

Basic land use type	Non-Household Sector	%	Household Sector	%	Both Sectors	%
Land under temporary crops	7	58.3	1,161	66.2	1,168	66.1
Land under temporary meadows and pastures	-	-	39	2.2	39	2.2
Land fallow	1	8.3	121	6.9	122	6.9
Land under permanent crops	-	-	155	8.8	155	8.8
Land under permanent meadows and pastures	3	25.0	181	10.3	184	10.4
Forest or wooded land	-	-	14	0.8	14	0.8
Suitable for agriculture	-	-	68	3.9	68	3.8
Built up areas	1	8.3	4	0.2	5	0.3
Other lands	-	-	12	0.7	12	0.7
All types	12	100.0	1,755	100.0	1,767	100.0

Source: 2014 Census of Agriculture

Table 17: Extent of lands by main land use type and sector, July 2013 - June 2014, IOR**(Hectares)**

Main Land Use Type	Non-Household Sector	Household Sector	Both Sectors
Agricultural Land	11	1,657	1,668
Cropland	8	1,476	1,484
Arable Land	8	1,321	1,329
Forest or wooded land	-	14	14
Other lands	1	84	85

*Source: 2014 Census of Agriculture***Table 18: Land extents by main land use type and region (Household Sector), July 2013 - June 2014, IOR****(Hectares)**

Main land use type	La Ferme	Maréchal	St. Gabriel	Baie Aux Huîtres	Port Mathurin	Grande Montagne	All regions
Agricultural Land	549	229	256	115	190	317	1,657
Cropland	472	192	241	95	175	302	1,476
Arable Land	434	181	215	75	147	270	1,321
Forest or wooded land	7	-	2	-	1	4	14
Other lands	36	3	18	1	5	20	84

Source: 2014 Census of Agriculture

Table 19: Distribution of land parcels by size and region (Household Sector), July 2013 - June 2014, IOR

Parcel size	La Ferme	Maréchal	St. Gabriel	Baie Aux Huîtres	Port Mathurin	Grande Montagne	All Regions
0 - 1 perche (0 - 0.02 ha)	12	71	187	30	18	233	550
2 - 4 perches (0.05 - 0.09 ha)	58	123	209	149	118	248	905
5 - 24 perches (0.12 - 0.57 ha)	152	238	484	199	266	470	1,810
25 - 49 perches (0.59 - 1.16 ha)	139	176	234	55	113	255	973
50 - 74 perches (1.18 - 1.75 ha)	181	207	181	94	111	290	1,065
75 - 99 perches (1.78 - 2.35 ha)	106	82	72	8	45	139	453
100 - 149 perches (2.37 - 3.53 ha)	346	189	169	77	92	182	1,055
150 - 199 perches (3.55- 4.71 ha)	104	27	45	7	22	56	260
200 - 499 perches (4.74 - 11.82 ha)	254	24	48	31	68	54	479
500 - 1000 perches (11.85 - 23.69 ha)	-	-	1	2	-	-	3
Above 1000 perches (Above 23.72 ha)	-	-	-	-	-	-	-
All sizes	1,353	1,136	1,631	652	855	1,925	7,552

Source: 2014 Census of Agriculture

Table 20: Area of land parcel by size and region (Household Sector), July 2013 - June 2014, IOR

(Hectares)

Parcel Size	La Ferme	Maréchal	St. Gabriel	Baie Aux Huîtres	Port Mathurin	Grande Montagne	All Regions
0 - 1 perche (0 - 0.02 ha)	-	-	-	-	-	-	-
2 - 4 perches (0.05 - 0.09 ha)	-	1	1	1	1	-	4
5 - 24 perches (0.12 - 0.57 ha)	4	7	12	7	7	13	50
25 - 49 perches (0.59 - 1.16 ha)	12	14	24	5	10	18	83
50 - 74 perches (1.18 - 1.75 ha)	29	35	32	23	20	50	189
75 - 99 perches (1.78 - 2.35 ha)	29	19	19	2	10	29	108
100 - 149 perches (2.37 - 3.53 ha)	122	64	78	32	43	89	428
150 - 199 perches (3.55- 4.71 ha)	74	38	35	5	20	47	219
200 - 499 perches (4.74 - 11.82 ha)	280	49	72	33	77	89	599
500 - 1000 perches (11.85 - 23.69 ha)	42	5	3	8	8	9	75
Above 1000 perches (Above 23.72 ha)	-	-	-	-	-	-	-
All Sizes	592	232	276	116	196	343	1,755

Source: 2014 Census of Agriculture

Table 21: Distribution of farmers by parcel size and region (Household Sector), July 2013 - June 2014, IOR

Parcel Size	La Ferme	Maréchal	St. Gabriel	Baie Aux Huîtres	Port Mathurin	Grande Montagne	All Regions
0 - 1 perche (0 - 0.02 ha)	3	22	16	11	7	18	77
2 - 4 perches (0.05 - 0.09 ha)	21	58	97	94	59	22	351
5 - 24 perches (0.12 - 0.57 ha)	93	127	266	206	199	285	1,176
25 - 49 perches (0.59 - 1.16 ha)	101	122	198	53	89	163	726
50 - 74 perches (1.18 - 1.75 ha)	135	188	156	137	113	258	987
75 - 99 perches (1.78 - 2.35 ha)	100	75	66	4	36	99	380
100 - 149 perches (2.37 - 3.53 ha)	300	175	203	81	107	235	1,101
150 - 199 perches (3.55- 4.71 ha)	120	79	66	15	38	87	405
200 - 499 perches (4.74 - 11.82 ha)	281	55	88	45	75	104	648
500 - 1000 perches (11.85 - 23.69 ha)	19	2	1	2	7	6	37
Above 1000 perches (Above 23.72 ha)	-	-	-	-	-	-	-
All Sizes	1,173	903	1,157	648	730	1,277	5,888

Source: 2014 Census of Agriculture

Table 22: Land area by tenure type and sector, July 2013 - June 2014, IOR*(Hectares)*

Tenure Type	Non-household Sector	Household Sector	Both sectors
Land owned	2	108	110
Land leased from Government	10	812	822
Land rented/leased from others	-	28	28
Other types of land tenure	-	807	807
All types	12	1,755	1,767

*Source: 2014 Census of Agriculture***Table 23: Land tenure by region (Household Sector), July 2013 - June 2014, IOR***(Hectares)*

Tenure Type	La Ferme	Maréchal	St. Gabriel	Baie Aux Huîtres	Port Mathurin	Grande Montagne	All Regions
Land owned	13	5	23	2	19	45	107
Land leased from Government	236	134	121	59	116	146	811
Land rented/ leased from others	8	6	7	-	1	6	28
Other types of land tenure	335	87	124	56	60	146	807
All Types	592	232	276	116	196	343	1,755

Source: 2014 Census of Agriculture