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2014 Census of Agriculture

TCP/MAR/3403 – Support to Census of Agriculture

Livestock Analysis Report

By

M. Gooljar

(FAO National Consultant)

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EXECUTIVE SUMMARY

The main livestock species reared in Mauritius are cattle (dairy and beef), goats, sheep, pigs, poultry (chicken and ducks) and deer. This report analyses data of the 2014Census of Agriculture on livestock production in the Republic of Mauritius and provides policy directions that may be employed to further develop the sector.

Main findings include:

- Total number of livestock farms is 5,937of which 79% were mixed farms
- The country counted 79,965 livestock units, which are almost evenly distributed between the household farms (51%) and the non-household farms (49%).
- At national level, poultry production was the most important livestock activity with 51% of the total livestock units of which 73% were in the non-household sector.
- The Livestock Units (LU) per 100 people comes to 5.83 which denotes very low livestock resources for the country
- Production and sales figures were presented.
- The LU/km^2, total land is 39.18 which is high compared to many countries because of the small available land area. This is indicative of the land scarcity for livestock production in Mauritius.
- The total number of persons employed in the livestock sector (including working proprietors, family members and paid employees) amounted to 4,245. This is only 6.1% of the total agricultural population of Mauritius which amounts to 69,854.
- Marketing is a major hurdle for farmers due to reduced access to remunerative markets.
- Import dependency is very high for most livestock products except for chicken and eggs.

Main conclusions were as follows:

- There was lack of private investment in certain livestock subsectors
- Proper classification of farmers is urgently needed for policy-making purposes
- There are inadequate livestock resources to meet the needs of the country
- Lack of market access should be addressed to improve prospects for farmers
- Regulatory framework and institutional capacity should be strengthened to enable access to export markets
- Strengthening institutional capacity for data collection and processing is crucial to enable proper implementation of policies
- Improved support to budding subsectors such as deer and honeybee is required.

1. INTRODUCTION

The main livestock reared in Mauritius are cattle (dairy and beef), goats, sheep, pigs, poultry (chicken and ducks) and deer. These subsectors have evolved disparately over time, with some species gaining prominence (e.g. poultry) while others declining (dairy and beef). On the other hand, consumption of livestock products has never ceased to increase, with rising per capita income and improvement in the way of life of the population. The importance of livestock products (animal-source foods) in the diet of the average Mauritian has increased considerably. With the notable exception of poultry (chicken and eggs), local production has not been able to satisfy the rising demand. This report analyses data of the 2014 Census of Agriculture on livestock production in Mauritius and provides policy directions that may be employed to further develop the sector.

1.1 Classification of farmers

Livestock production is typically associated with issues such as food security, economic development and poverty alleviation. These issues are not necessarily compatible with each other. The operators of the livestock sector have varying objectives but they can generally be classified into two broad groups: livelihood-oriented livestock farmers and business-oriented livestock farmers.

Livelihood-oriented (household) livestock farmers have the following characteristics:

(i) Very small herds (less than 3 cows equivalent);
(ii) Livestock not the main source of income (less than 25% of cash income from livestock);
(iii) Usually unable (or not interested) in tapping into the mainstream livestock product markets.

Business-oriented (non-household) farmers have the following characteristics:

(i) Relatively large herds
(ii) Sell livestock products for cash; livestock is key for income (>25% of cash income from livestock)
(iii) Usually geared towards mainstream livestock product markets

In Mauritius, there are significant numbers of livelihood-oriented farmers and a growing community of business-oriented farmers. Both types of activities are important to society. Livelihood-oriented farming holds its importance in poverty alleviation and food security at the level of the family. Business-oriented farming contributes to economic development and food security at the national level. For policy purposes, it is necessary to differentiate between these two types of farmers.

1.2 Comparisons between livestock species

Comparison of the different livestock species is difficult since different types of livestock have different management requirements, environment impacts and metabolisms. The method commonly used to facilitate comparisons between species is the *Livestock Unit (LU)*. The LU makes use of an exchange ratio (Livestock Unit Coefficient-LUC) between different species of average size. This ratio is based on the differences in *metabolic weight* between the species. Metabolic weight is considered as the best unit for aggregation of animals of different species as it influences amount of feed consumed, waste generated and product produced. The standard used is 1 LU equals one adult dairy cow producing 3,000kg of milk annually. LUCs have been worked out by the FAO for different regions of the world including for sub-Saharan Africa.

Table 1.1: Livestock Unit Coefficients, Sub-Saharan Africa

Species	LUC
Cattle	0.5
Goats/Sheep	0.1
Pigs	0.2
Poultry	0.01

Source: FAO, 2011

However, it must be noted that the average live weights (and hence the metabolic weights) of cattle in Mauritius is closer to the standard. Hence, for cattle, the exchange ratio should be one. For the other species, the LUCs for sub-Saharan Africa can be safely used in the Mauritian context. The LUCs for Mauritius should therefore be as follows:

Table 1.2: Livestock Unit Coefficients, ROM

Species	LUC
Cattle	1
Goats/Sheep	0.1
Pigs	0.2
Poultry	0.01

2. LIVESTOCK RESOURCES

2.1 Number of farms

The majority of farms (53.8%) were mixed farms, that is, they undertook both crop and livestock farming. The majority of farms were found in the island of Mauritius (90%). Goat and sheep farms constitute 11% of the livestock community. Poultry farms, which supply most of the country's needs in chicken and eggs, are only 1.2% of all farms. The overwhelming majority of farms (99.5%) were from the household sector. The low number of non-household farms is a source of concern as commercial enterprises are the real drivers of any sector. The lack of commercial enterprises usually means low overall development of the sector.

Table 2.1: Number of farms by livestock type and sector, July 2013 - June 2014, ROM

	IOM		IOR		ROM	
	Household farms	Non-household farms	Household farms	Non-household farms	All Farms	*% of total*
Cattle	245	2	7	-	254	*2.0*
Goats and sheep	655	-	-	-	655	*5.1*
Pigs	173	-	4	-	177	*1.4*
Poultry	90	10	3	1	104	*0.8*
Bee	48		13	5	66	*0.5*
Deer	-	10	-	-	10	*0.1*
Mixed Livestock	4,102	1	568	-	4,671	*36.3*
Mixed Farming (Crops+ Livestock)	2,933	40	3,941	7	6,921	*53.8*
Total Livestock	**8,246**	**63**	**4,536**	**13**	**12,858**	***100.0***

Table 2.2 compares the number of small-scale farms by livestock type as published in the Digest of Agricultural Statistics and as reported in the Census 2014. For cattle, goats and sheep, the Census 2014 reveals a larger number of farms as what is normally reported. The lower number of pig farms reported in CA2014 might be due to the pig business being cyclical. Farmers regularly back out of the business when prices are low and come back when prices are high.

Table 2.2: Number of small breeders by livestock type, end December 2014 & CA2014, IOM

	end December 2014[1]	**CA2014**
Cattle	811	1,108
Goats and sheep	2,853	4,262
Pigs	444	374
Poultry	N/A	N/A
Bee	N/A	N/A
Deer	N/A	N/A

[1]*published in Digest of Agricultural Statistics 2014*

2.2 Livestock Numbers

The country has a total of 79,965 livestock units, which were almost evenly distributed between the household farms (51%) and the non-household farms (49%). However, the private sector was more involved in the poultry, cattle and deer sectors and less in goat/sheep and pig production. For the household farms, cattle and poultry were the most common species. At national level, poultry production was the most important livestock activity with 54% of the total livestock units.

Table 2.3: Number of heads by livestock type as at June 2014, ROM

	IOM	IOR	**ROM**
Cattle	13,870	10,700	**24,570**
Goats and sheep	46,090	29,575	**75,665**
Pigs	21,400	16,100	**37,500**
Poultry	3,835,500	233,000	**4,068,500**
Deer	33,800	-	**33,800**
Beehives	4,470	2,790	**7,260**

The majority (83%) of livestock units were found in the Island of Mauritius. The profile of livestock production in the Island of Mauritius was quite different from that of the Island of Rodrigues. In the Island of Mauritius, there was a focus on poultry production while in the Island of Rodrigues the majority of livestock were cattle.

Based on the end June 2014 population figures, the LU per 100 people works out to 5.83 which was very low. In the present state, availability of food of animal origin is not a problem as most is imported. However, in a scenario of global food crisis, such a low level of livestock resources may pose a serious food security threat for the population.

Figure 2.1: Distribution of total Livestock Units as at June 2014, IOM and IOR

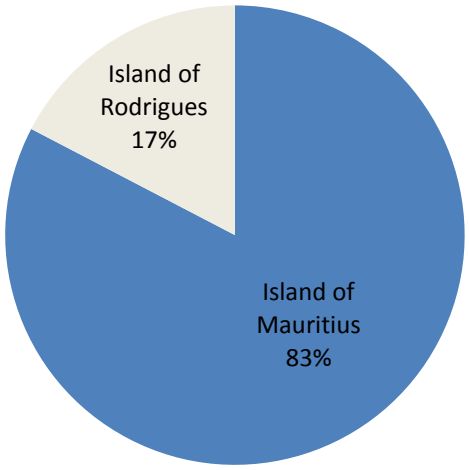
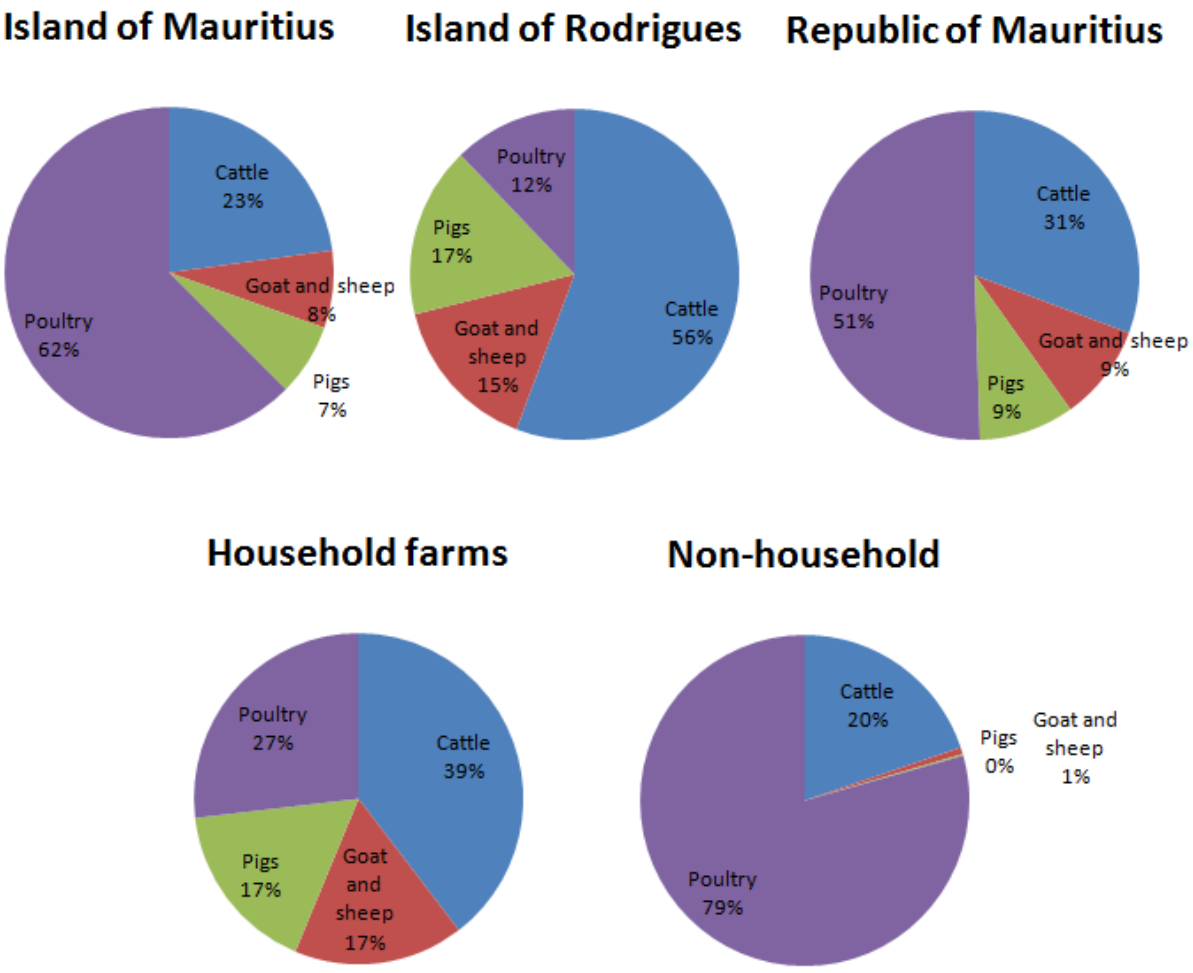


Figure 2.2: Contribution of livestock to total Livestock Units by type and sector as at end June 2014, ROM



Again, when comparing the Census figures with the official statistics of the Digest of Agricultural Statistics 2014, a discrepancy is noted. However, in the case of livestock numbers, it seems that the official statistics underestimated the herd size. For example, the Digest 2014 provided a cattle herd size of 4,810 while the Census gave a herd size of 13,870. The higher figures are explained by the fact that year-end figures are always lower than figures at the mid of the year. Thus the Digest, which has as cut-off date end December, will have lower figures since most fattening animals (beef, goats and pigs) would have been slaughtered before the New Year. As at 30 June 2014, the cut-off date for the Census, these animals would still be in the national herd.

Table 2.4: Livestock Numbers by type as at end December 2014, IOM

	Number
Cattle	4,810
Goats and sheep	29,115
Pigs	17,511

Source: Digest of Agricultural Statistics 2014, SM

3. LIVESTOCK PRODUCTION

3.1 Cattle subsector

The cattle subsector (dairy and beef) consisted of 24,570 heads. Over71% of the cattle population were owned by household farms. Only 29% were owned by business farms. Over 47% of the total livestock units consisted of fattening bulls (used for beef production). Male calves mostly ended up as fattening animals as well. Thus, percentage of meat animals was 50%.

In the dairy herd of Rodrigues, the percentage of milking cows (i.e. productive animals) was only 6%. Dry cows (non-milking cows) and other non-productive herd components were a majority. Milking cows as a percentage of the total number of cows was 9%. The standard for a productive herd is to have 70% of the cow population in production. Below this level, there is indication of poor herd management at farm level. It may indicate poor replacement rate, that is, the number of adult and young heifers (which are the productive cows of tomorrow) is insufficient to ensure a healthy growth of the herd.

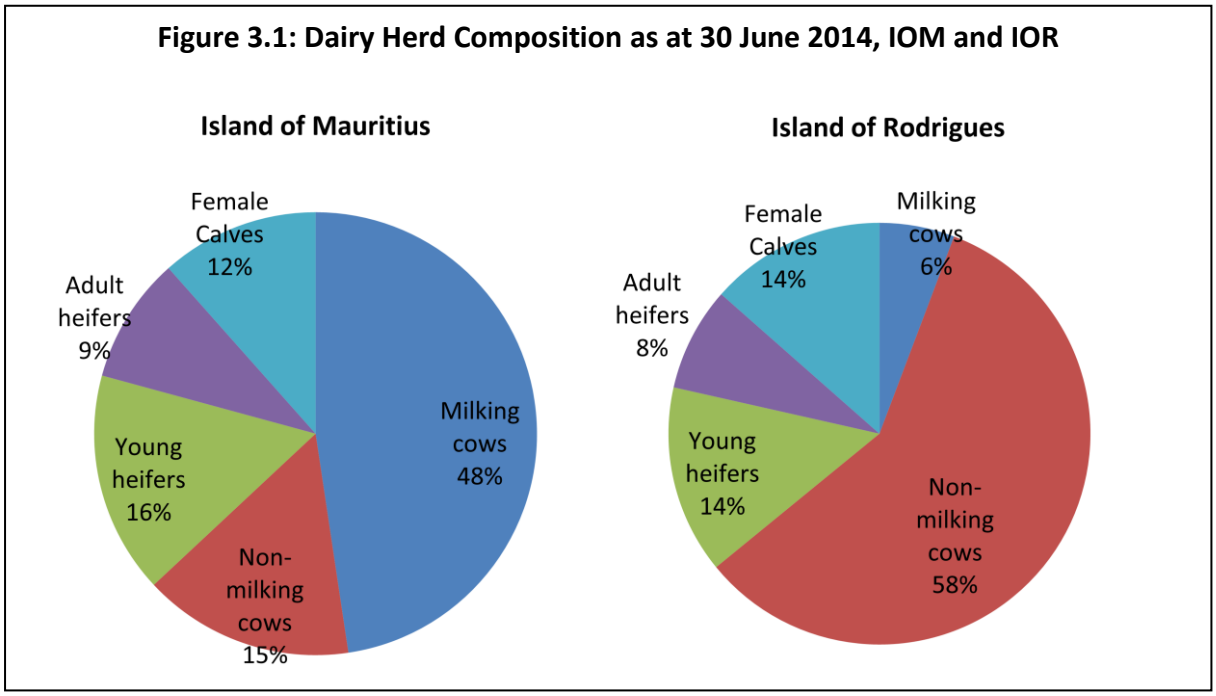
The dairy herd of the Island of Mauritius was much better managed with 48% of the herd comprising of milking cows. The number of milking cows as a percentage of the total number of cows was 75% (72% for household farms; 87% for non-household farms). The breeding practices of the Mauritian dairy farmers were therefore adequate to ensure good herd progression.

Cattle sales between July 2013 and June 2014 are summarized in Tables 3.1 and 3.2. In the dairy herd, many of the sales involved breeding animals and replacement stock. There were also a significant number of sales of milking cows (cows in production). Cattle sales can occur for any number of reasons including culling from the herd for health or poor productivity reasons. However, the sale of replacement stock (female calves, adult and young heifers) for slaughter would be a cause for concern if it were a significant proportion of the herd. This, however, does not seem to be the case. The slaughter statistics from the Mauritius Meat Authority (Table 3.4) shows that the number of cattle slaughtered at the Central Abattoir was less than that reported in CA2014. This implies a high

incidence of off-abattoir slaughters. Furthermore, it is to be noted that a significant number of heads were imported for slaughter by the non-household sector mainly for religious purposes. These cattle are mostly sold to individuals holding special slaughter permits.

Milk production is summarized in Table 3.3. There was a marked difference in the cow productivity between household and non-household farms, 5.4L/day/cow and 10.7L/day/cow respectively. This is indicative that the level of management was higher in business-oriented farms than it is in household farms. The bulk of the production (more than 70%) still came from small-scale farmers. Commercial production accounted for 30% of total milk production. Milk production from Rodrigues consisted of less than 0.5% of the national milk production.

Figure 3.1: Dairy Herd Composition as at 30 June 2014, IOM and IOR



Note: Breeding bulls were counted collectively for beef and dairy.

Figure 3.2: Beef Herd Composition as at 30 June 2014, IOM and IOR

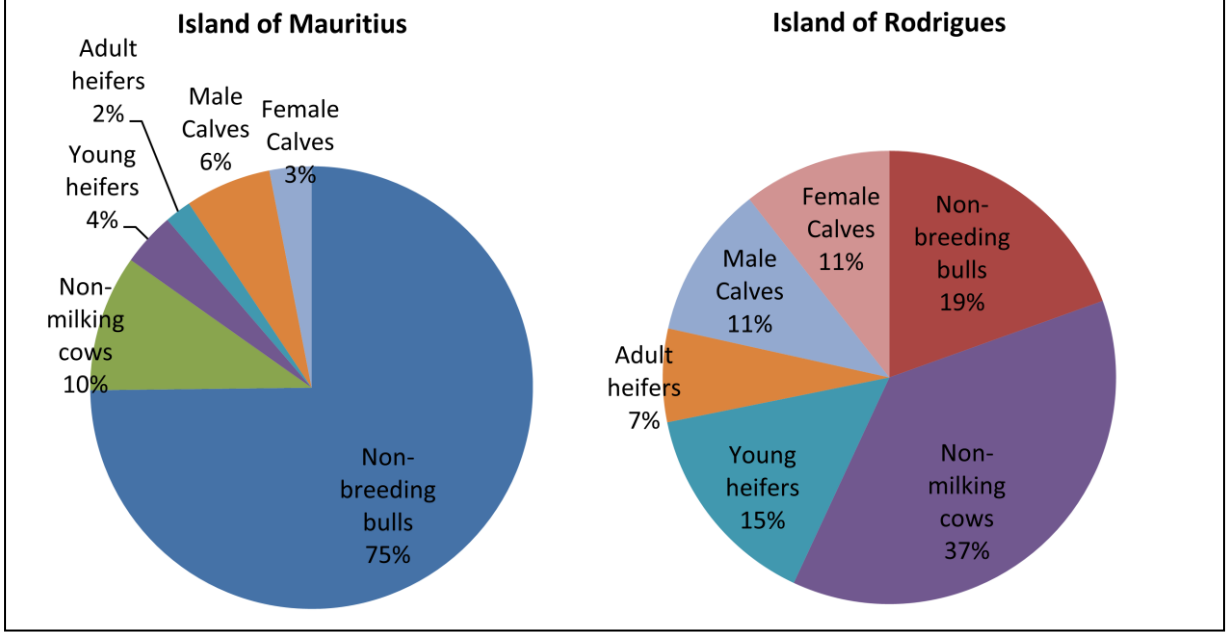


Table 3.1: Sale of cattle by type, July 2013 - June 2014, IOM

	Household farms		Non-Household farms	
	Sold Live	Slaughtered	Sold Live	Slaughtered
Bulls Breeding	310	95	45	-
Bulls Non Breeding	930	785	490	5,000
Cows Milking	360	30	20	-
Cows Non_Milking	230	110	100	-
Heifers Young	180	30	30	-
Heifers Adult	145	55	15	-
Male Calves	130	15	5	-
Female Calves	50	-	10	-
Total	2,335	1,120	715	5,000

Table 3.2: Sale of cattle by type, July 2013 - June 2014, IOR

	Household farms		Non-Household farms	
	Sold Live	Slaughtered	Sold Live	Slaughtered
Bulls Breeding	270	5	-	-
Bulls Non Breed	960	35	-	-
Cows Milking	15	-	-	-
Cows Non_Milking	360	10	-	-
Heifers Young	100	10	-	-
Heifers Adult	100	15	-	-
Male Calves	140	-	-	-
Female Calves	30	-	-	-
Total	1,975	75	-	-

Table 3.3: Milk Production, July 2013 – June 2014, ROM

	Milk production, July 2013 - June 2014(L)	Number of milking cows, as at 30 June 2014	Average Milk production per cow per day (L)
Household farms	3,007,500	1,525	5.4
of which Rodrigues	213,100	115	5.2
Non-household farms	1,593,700	410	10.7
Total	4,601,200	1,935	7.0

Table 3.4: Slaughter Statistics, 2014, IOM

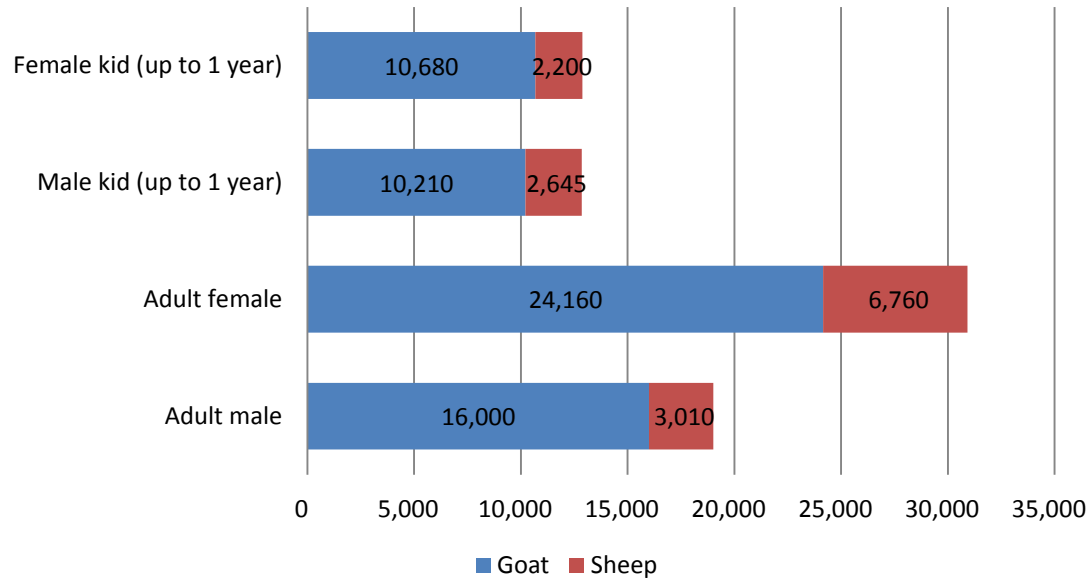
Type of cattle	Number of heads
Local	246
Rodriguan	122
Imported	7,266

3.2 Goats and sheep subsector

In terms of livestock units, the goats/sheep herd came to 7,567. Figure 3.3 summarizes the main components of the goats and sheep herd and shows an abundance of adult females, ready to reproduce (41% of the total number of heads). About 80% of these females were kept only for breeding (Figure 3.4). Moreover, there were a healthy number of female kids to ensure adequate renewal of the breeding females (17% of the herd were female kids; 72% of which were kept for breeding). In fact, 63% of the 75,665 heads that formed the goats and sheep herd were animals kept for breeding. There was therefore no lack of breeding animals which could constrain the herd progression. Thus, from a policy standpoint, the development of the goats/sheep sector hinges more on the quality of animals rather their availability. The introduction and propagation of high productivity breeds should be the focus of interventions in the goats/sheep sector.

Goat and sheep sales totalled 31,940 heads between July 2013 and June 2014. There is very high demand for goat and sheep meat in the local market, particularly around the festive season. The meat of the adult male is particularly appreciated. It is, however, important to note that there was a discrepancy between the number of animals sold live and those slaughtered. Nearly 70% of the sales were as live animals. Goats and sheep are home slaughtered, in most cases without proper authorizations and due regard to sanitary conditions. According to the Digest of Agricultural Statistics 2014, some 3,682 local and Rodriguan goats and sheep were slaughtered at the Central Abattoir in 2014. The CA2014 however records up to 8,850 goats and sheep sent for slaughter. The discrepancy between these figures underscores the problem of illegal slaughter. Illegal slaughter is major challenge as it undermines consumer confidence in locally produced livestock products especially in terms of food safety.

Figure 3.3: Goat and Sheep Herd Composition as at end June 2014, ROM



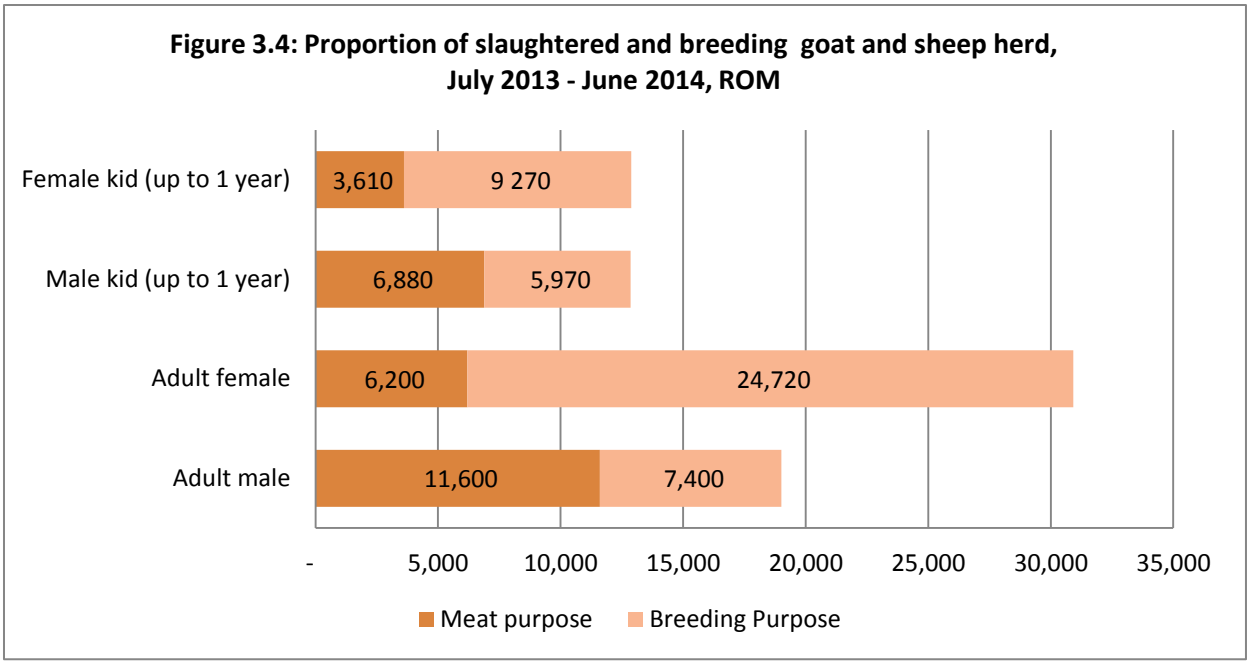


Table 3.5: Sale of goats and sheep, July 2013 - June 2014, ROM

	IOM		IOR		ROM	
	Sold live	Slaughtered	Sold live	Slaughtered	Sold live	Slaughtered
Adult male	7,875	5,610	4,980	90	12,855	5,700
Adult female	5,630	2,145	1,880	5	7,510	2,150
Male kid (up to 1 year)	850	860	430	10	1,280	870
Female kid (up to 1 year)	1,245	130	200	-	1,445	130

3.3 Pig subsector

The pigs herd consisted of 37,490 heads (7,498 LUs); 57% of the herd was in the Island of Mauritius while 43% was in the Island of Rodrigues. The herd composition is given in Figure 3.5. There were a very high number of fattening animals in the herd (more than 60%). The high prolificacy of pigs implies that there is no need to keep a high number of breeding animals. The ratio of breeding sows to piglets shows quite low productivity (one breeding sow produced on average only 4.4 piglets). This indicates an underlying farm management problem.

Farmers sold 33,930 heads over the period July 2013 to June 2014. Nearly 70% of sales were as live animals. Unlike for other sectors, however, there was little discrepancy between official slaughter statistics and the CA2014 data. Abattoir slaughters amounted to 8,516 heads in 2014 while CA2014 indicates that 9,810 heads were sent for slaughter. The problem of illegal slaughter was therefore not any less than the goat subsector or cattle subsector. As shown in Figure 3.5, the majority of pigs were fattening animals (i.e. meant for slaughter). Figure 3.6 shows that most sales occurred as live animals. It can therefore be construed that an important percentage of live sales also result in slaughters. These slaughters were not performed at the Central Abattoir.

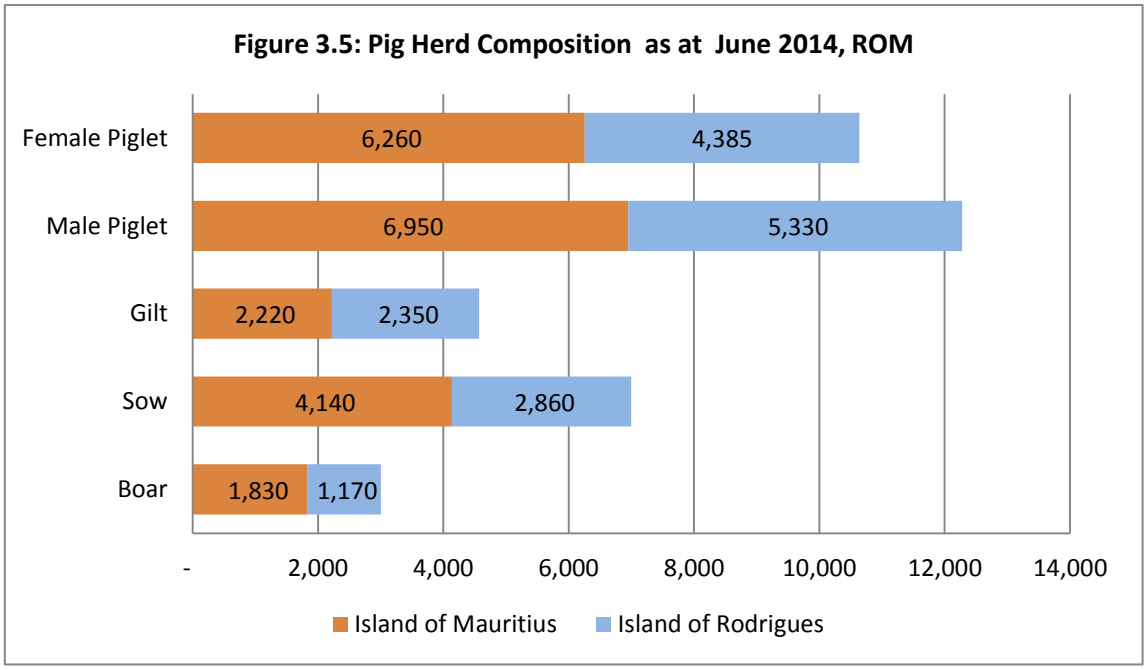
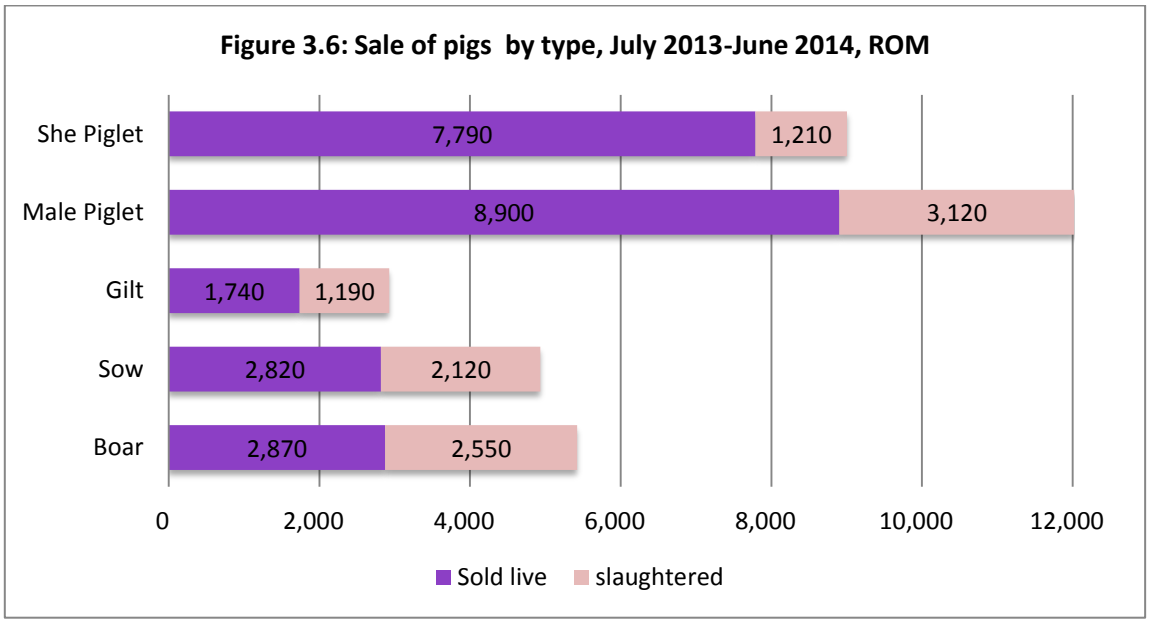


Table 3.6: Sale of pigs, July 2013 - June 2014, ROM

	IOM		IOR		ROM	
	Sold live	Slaughtered	Sold live	Slaughtered	Sold live	Slaughtered
Boar	2,370	1,885	500	610	2,870	2,495
Sow	2,155	1,540	660	530	2,815	2,070
Gilt	780	330	955	790	1,735	1,120
Male Piglet	1,900	990	6,990	1,970	8,890	2,960
Female Piglet	2,205	595	5,605	570	7,810	1,165
Total Pigs	**9,410**	**5,340**	**14,710**	**4,470**	**24,120**	**9,810**



3.4 Poultry subsector

The poultry subsector is a very important component of the livestock industry. Chicken and eggs are the only livestock products in which Mauritius is self-sufficient. It is also a subsector where there is high private sector involvement. The subsector brings a total of 39,818 LUs (79% of this figure is attributable to broiler chicken), which is the highest among all livestock species. Other poultry species such as ducks and turkeys represent a very small proportion of the flock. Development of these species has not followed the same path as for chicken and perhaps require more support to reach their potential. Broiler production is more important in the Island of Mauritius as opposed to Rodrigues. In Rodrigues, poultry production is more focused on local poultry species rather than broilers or layers. The number of local poultry in Mauritius is also not insignificant.

Table 3.7: Poultry numbers by type and sector as at end June 2014, ROM

	Household sector	Non-household sector	**Both sectors**
Broilers	735,980	2,466,600	3,202,580
Layers	253,250	432,100	685,350
Local poultry	152,980	-	152,980
Duck	16,920	1,150	18,070
Turkey	350	140	490
Other poultry	7,700	1,340	9,040

Table 3.8: Poultry numbers by type and island as at end June 2014, ROM

	IOM	IOR	**ROM**
Broilers	3,126,100	76,500	3,202,600
Layers	668,900	16,500	685,400
Local poultry	26,800	126,200	153,00
Duck	4,500	13,600	18,100
Turkey	500	-	500
Other poultry	8,600	500	9,100

Over 99.4% of the sales volume represented broiler chicken sold for meat. The other poultry species represented only 0.6% of the market. The market was dominated by large-scale companies. Smallholders represented less than 8% of the market.

Table 3.9: Sale of poultry for meat by sector, July 2013 - June 2014, ROM

(Tonnes)

	Household sector	Non-household sector	**Both sectors**
Broilers	3,900	33,300	37,200
Local poultry	80	-	80
Duck	4	6	10
Turkey	1	1	2
Layers	350	590	940
Other[1]	90	-	90

[1] *includes guinea fowls and geese*

Table 3.10: Sale of eggs by sector, July 2013 - June 2014, ROM

	Household sector	Non-household sector	**Both sectors**
No of eggs sold	1,900,000	63,400,000	65,300,000

Egg production was also a significant activity, especially in the Island of Mauritius (17% of the poultry flock consisted of layers). Over 97% of all eggs produced and sold were from non-household farms.

3.5 Deer subsector

Deer were introduced to Mauritius during the Dutch period. Since then, they have successfully colonized Mauritian wildlife and are now a self-sustaining population. However, its development as a livestock species has not been very significant even though venison is widely consumed and well appreciated by Mauritians. It has remained mostly a game animal that is hunted in chassées and the excess meat is sold almost as a by-product. Deer feedlots, where deer are kept in relatively intensive conditions, are a recent phenomenon and it is still a budding industry.

Table 3.11: Deer Population by sector as at 30 June 2014, IOM

	Household sector	Non-household sector	**Both sectors**
Deer chassées	1,400	28,800	30,200
Deer feedlot	-	3,600	3,600
Total	1,400	32,400	33,800

Table 3.12: Sales of venison by sector, July 2013 - June 2014, IOM

(Tonnes)

	Household sector	Non-household sector	**Both sectors**
Deer chassées	10	710	720
Deer feedlot	-	30	30
Total	10	740	750

3.6 Honeybee subsector

There were a total of 7,270 beehives in the Republic of Mauritius, 74% of which were productive as at the 30 June 2014. About 41% of productive beehives were found in Rodrigues. More than 45% of honey produced came from Rodrigues.

Table 3.13: Number of hives and honey production, ROM

Item	IOM	IOR	ROM
Number of productive beehives as at 30 June 2014	3,190	2,225	5,415
Number of non-productive beehives as at 30 June 2014	1,290	565	1,855
Production of honey, July 2013- June 2014 (tonnes)	34	27	61

3.7 Summary of Livestock Production

Table 3.14: Livestock Production, July 2013 - June 2014, ROM

(Tonnes)

Product	Local production
Milk	4,950
Beef	2,860
Goat and sheep meat	325
Pork	2240
Poultry[1]	43,500
Eggs	3,595

[1] includes local chicken, turkey and duck meat

4. LIVESTOCK DENSITY

Livestock density measures the concentration of livestock over a specified area. It is a measure of the environmental impact of livestock production as well as the relative availability of land resources for livestock. Generally, the higher the livestock density, the higher the environmental impact since livestock would be in close contact with human populations. A high livestock density also implies low land availability as livestock production is constrained over the limited area.

The two indicators used to measure livestock density are LU per square kilometres (total land area) and LU per square kilometres, agricultural land. Agricultural land (or Utilised Agricultural Area, UAA) refers to the area used for farming. It includes arable land, permanent grassland, permanent crops and other agricultural land such as kitchen gardens. It however excludes unused agricultural land, woodland and land occupied by buildings, farmyards, tracks, ponds, etc.

Table 4.1: LU per km^2 by livestock type, ROM

	LU	LU/km^2, total land	LU/km^2, UAA
Cattle	24,576	12.05	42.20
Goats and sheep	7,566	3.71	12.99
Pigs	7,498	3.68	12.88
Poultry	40,285	19.75	69.17
Total	**79,925**	**39.18**	**137.24**

The livestock density was quite high compared to many countries because of the small available land area. This is indicative of the land scarcity for livestock production in Mauritius. As expected, density for poultry was highest, followed by cattle. Goats, sheep and pigs had low densities.

4.1 Availability of exercise yards for livestock

Good livestock keeping requires the availability of space for rearing. Adequately sized exercise yards are very important for animal welfare but also for maintaining the environmental pressure of the livestock activity at an acceptable level. Only 16% of farms had an exercise yard. Overall, for farms with an exercise yard, the area available was around 0.08 m^2 per livestock unit. Sheep in the Island of Mauritius seemed to benefit from the most space with over 475 m^2 per livestock unit. Animals in the Island of Rodrigues tend to have less exercise yard space than those in the Island of Mauritius. Tables 4.2 and 4.3 provide details on availability of exercise yard space for livestock in the Islands of Mauritius and Rodrigues.

Table 4.2: Exercise yard by livestock type as at June 2014, IOM

Livestock Type	No. of farms having exercise yard	Average size of yard (m^2)	Number of Heads	Number of LUs	Area available per LU (m^2)
Cattle only	60	85	320	319	0.26
Goat only	530	85	8 550	855	0.10
Sheep only	10	7,560	160	16	475.34
Pig only	130	150	3,460	692	0.22
Mixed livestock	330	500	3,310	1,604	0.31
All types	1,060	280	15,800	3,486	0.08

Table 4.3: Exercise yard by livestock type as at June 2014, IOR

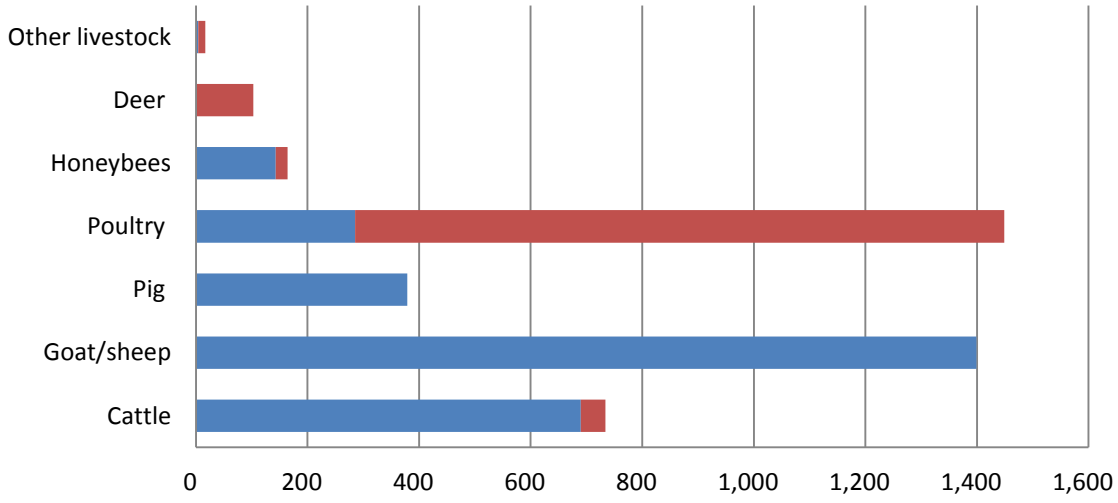
Livestock Type	No. of farms having exercise yard	Average size of yard (m^2)	Number of Heads	Number of LUs	Area available per LU (m^2)
Cattle only	10	50	70	71	0.68
Goat only	70	20	710	71	0.30
Sheep only	10	20	220	22	0.79
Pig only	360	30	1,320	264	0.10
Mixed livestock	570	75	13,700	3,878	0.02
All types	1,020	50	16,020	4,306	0.01

5. EMPLOYMENT IN THE LIVESTOCK SECTOR

The CA2014 revealed that the total number of persons engaged in the livestock sector (including working proprietors, contributing family workers and paid employees) amounted to 4,245. This represented only 6.1% of the total employment (69,767) in the household and non-household sectors of the Republic of Mauritius. At the national level, employment in the livestock sector represented around 0.8% of total employment. Household farms had the bigger share of employment with 68% of employed persons. However, private enterprises employed more persons per farm. The average number of persons employed per household farm was only 1.1 while for non-household farms it was 46.4.

The biggest employer was the poultry sector with 34% of all employed persons. It was closely followed by goats and sheep with 32%. However, in the case of goats and sheep subsector, the majority of the workers were the farmers themselves and their family members.

Figure 5.1: Employment in the livestock sector, July 2013-June 2014, ROM

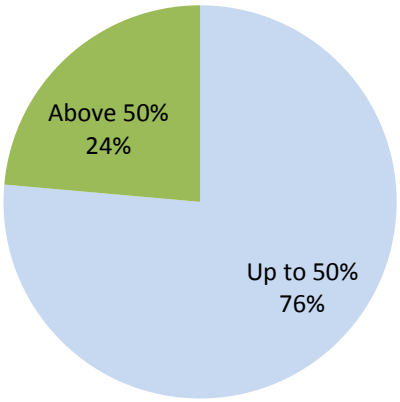


	Cattle	Goat/sheep	Pig	Poultry	Honeybees	Deer	Other livestock
Household farms	690	1399	379	285	143	0	4
Non-household farms	44	0	0	1164	21	103	13

6. DEPENDENCE ON FARMING

The contribution of livestock farming to the income of the farmers' family is a key indicator towards assessing the importance of livestock rearing in the community. While high off-farm incomes may be critical for the well-being of families, it is indicative that farming has a lesser importance as an income-generating activity. Figure 6.1 shows that less than one-quarter of farmers derived more than 50% of their household income from the farming activity. The majority of farmers therefore are not professional farmers. While it may seem that livestock production is not an important activity nationwide, it must be noted that farms deriving more than 50% of their income from farming support close to 10000 family members. The average family size of these farms is 3.6. Moreover, of farms having an outstanding agricultural loan, 44% are from this category of farmers.

Figure 6.1: Household income from farming, July 2013-June 2014, ROM



7. MARKETING OF LIVESTOCK PRODUCTS

Marketing is a major hurdle for small and medium-scale farmers. Often farmers complain of having difficulty in finding outlets to dispose their products. Figure 7.1 shows the preferred marketing practices of each type of farmer for the island of Mauritius.

For many livestock products, the proportion of sales effected directly to the consumer is significantly high (the highest is for goat meat) with the notable exception of poultry meat and eggs. Direct sales are usually synonymous with less intermediary costs and higher revenue. However, it also results in higher marketing cost and is usually more time-consuming for the farmer to undertake. Thus, in the overall picture, farmers often find themselves with a product that they cannot sell. If the example of the poultry subsector is taken, virtually no sale is effected directly to the consumer. Yet, the poultry industry is certainly the most profitable livestock enterprise. Direct sales are also problematic in that there is virtually no control over the quality and safety of the product. This undermines consumer confidence in local livestock products and generally condemns the industry to low consumption. Marketing channels add value to the product by improving quality and marketability of the product. For most livestock products, save chicken and eggs, this is not the case.

The relatively high proportion of direct sales in the marketing mix of farmers indicates poor access to more sophisticated marketing channels. Small-scale farmers are usually unable to provide the quality level to meet the requirements of higher-end markets such as hotels and supermarkets. Lower-end markets being less remunerative, the smallholder is condemned to a low income business model. There is therefore no incentive to increase production and productivity. The net effect is that national production becomes constrained in a low production vicious cycle. The low-income, low-production business model is of course unsustainable in the long run. Livestock production will therefore continue to decline unless the problem of market access is resolved.

It is also worthwhile to note the absence of export marketing channels and agro-processing. The Mauritian livestock sector has so far been unable to tap into export markets, mostly because the regulatory framework does not permit it. Value addition by processing is also a very rare occurrence. A few attempts are seen by the private sector but the majority of sales compose of the primary product only. There is therefore a lack of locally produced processed livestock products which helps in maintaining very high import levels.

Subsistence farming (i.e. production for own consumption) does not seem to be a widespread activity. In fact, more than 96% of farmers state that the main purpose of their activity is for sale. There is therefore a relatively important engagement in commercial agriculture which augurs well for the development of the livestock sector.

In Rodrigues, there is better utilisation of intermediaries in the disposal of livestock produce. Wholesalers and retailers are the preferred marketing outlets for many products. There is also more important percentage that goes for own consumption, especially for poultry and pork.

Figure 7.1: Percentage distribution of farmers by marketing practice of selected items, IOM

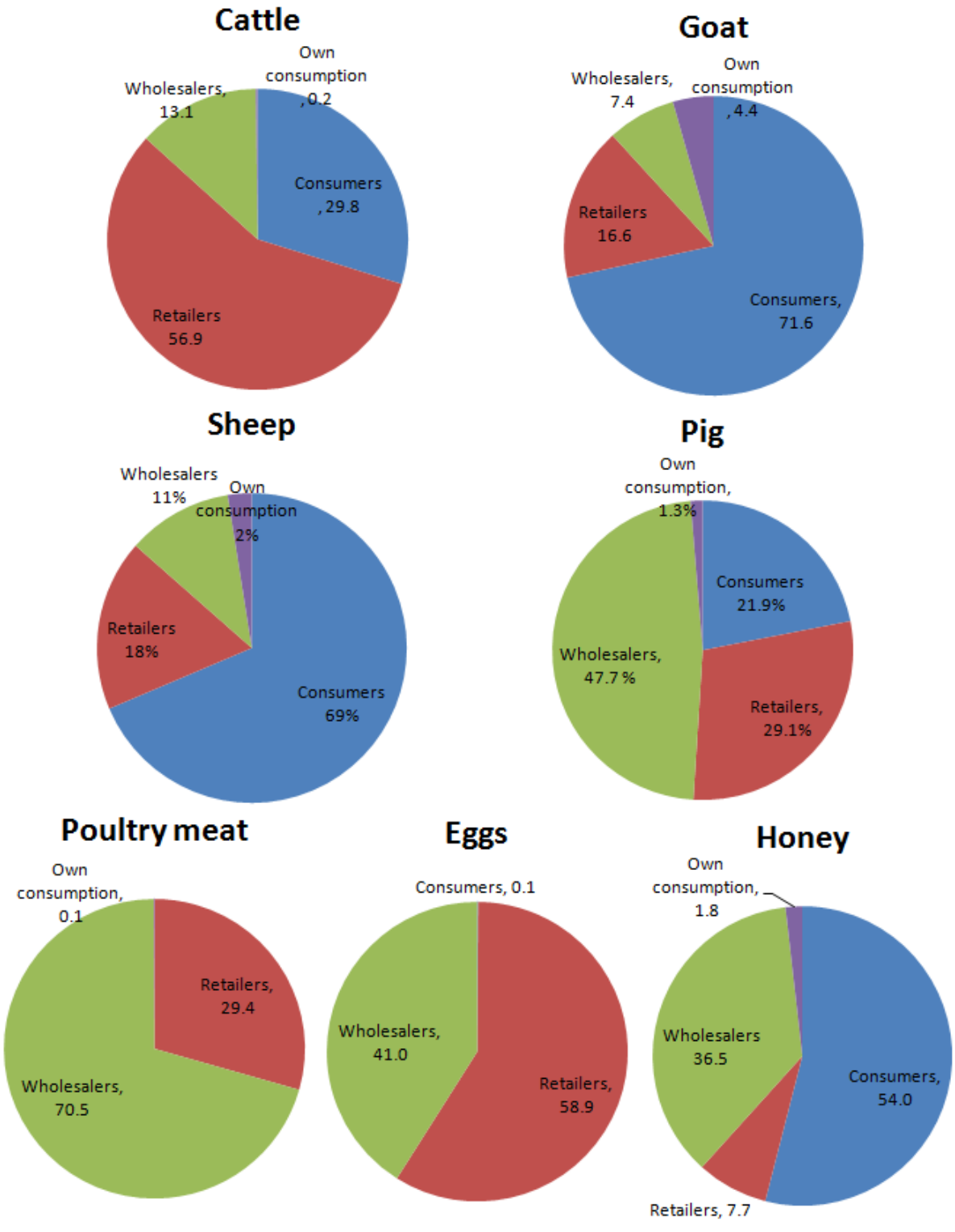
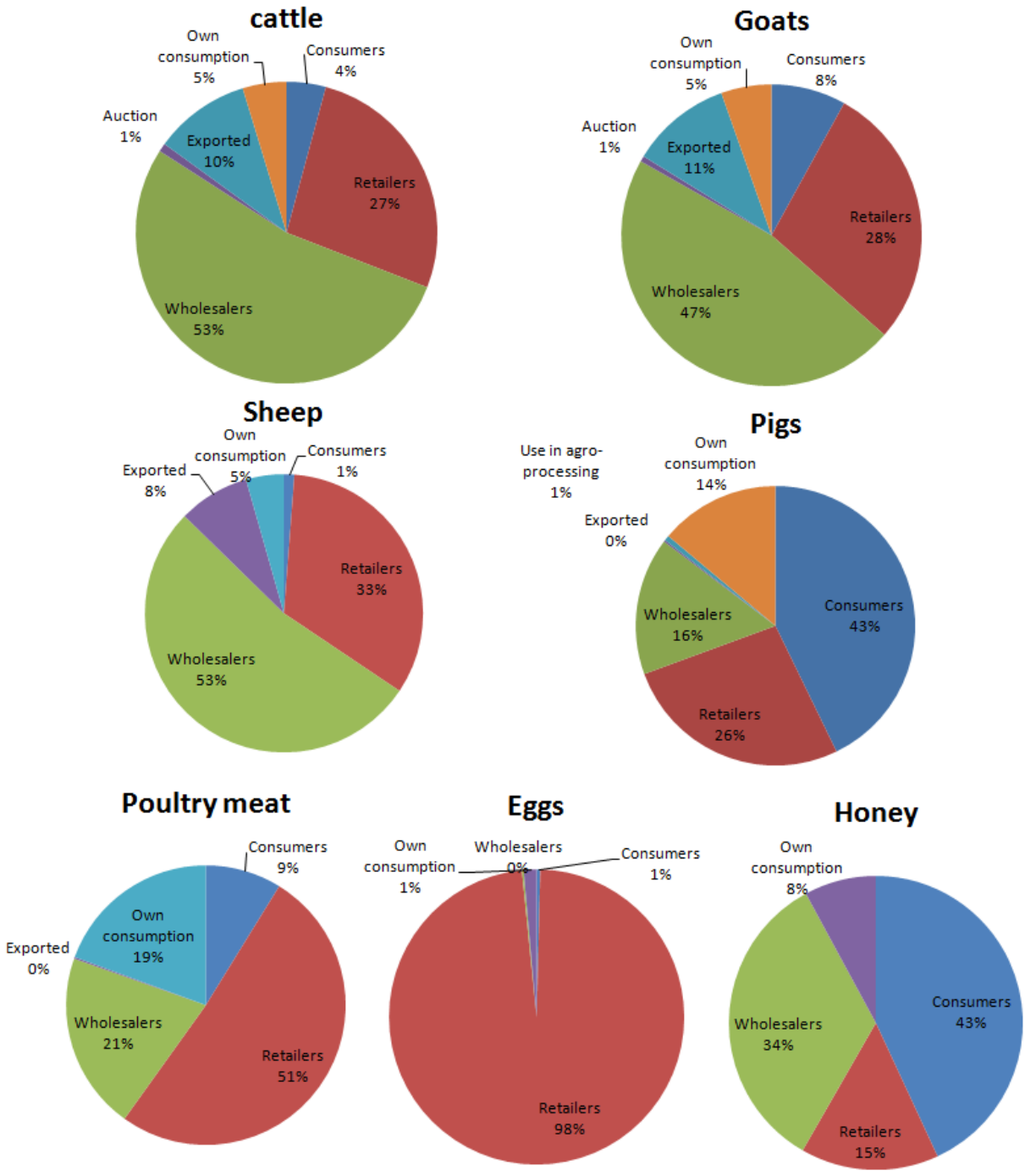


Figure 7.2: Percentage distribution of farmers by marketing practice of selected items, IOR



8. IMPORT DEPENDENCY AND SELF SUFFICIENCY

The proportion of total domestic consumption of food products that is supplied by imports gives the import dependency of the country. In a scenario where the country's economy is able to afford it, import dependency may not be a major cause for concern. However, high import dependency implies an excessive reliance on political, economic and environmental stability of the countries from which the food is being imported. In an era of uncertainty caused by climate change and geopolitics, such reliance may not be wise.

The Import Dependency Ratio (IDR) gives an idea of how much of the domestic food supply is imported. It is computed as follows:

$$IDR = \frac{Imports}{Production + Imports - Exports}$$

The Self-Sufficiency Ratio (SSR) on the other hand gives an idea of how much of the domestic food supply is produced locally. It is computed as follows:

$$SSR = \frac{Production}{Production + Imports - Exports}$$

Table 8.1 below provides IDR and SSR values for selected livestock products, based on data supplied by the Food Balance Sheets 2013.

Table 8.1: Import Dependency and Self Sufficiency Ratios for selected livestock products

Product	Local production (t)[1]	Imports[2]	Exports[2]	IDR	SSR
Milk	4,950.89	24,465	1063	86.3	17.5
Beef	301.55	3,540	3	92.2	7.9
Goat and sheep meat	92.23	4,826	0	98.1	1.9
Pork	666.36	961	1	59.1	41.0
Poultry	36,484	356	1	1.0	99.0
Eggs	3,822.57	0	0	0.0	100.0

[1]Based on CA2014 figures

[2]Based on Food Balance Sheets, Digest of Agricultural Statistics 2014

Table 8.1 shows that for several products the dependency on imports is very high, including for essential commodities like milk and milk products. With the exception of poultry and eggs (in which the country is close to 100% self-sufficiency), there is very high dependence on imports for other livestock products.

It must be noted that for goat, sheep and pork, local production may be much higher than what is reported in Table 8.1 as these account for abattoir slaughters only. However, it is estimated that a significant proportion of goat, sheep and pig slaughters do not go through the abattoir. Import dependency for these products should therefore be considered as lower.

9. CONCLUSIONS AND RECOMMENDATIONS

9.1 Recommendations for census data collection

With seventy years since the last census, the 2014 Census of Agriculture can be considered to be a first exercise. As with any first, there is room for improvement. The following improvements in the questionnaire can be envisaged to enable a clearer picture of the livestock sector to be taken.

Enable data collection on a district basis

An essential piece of information for policymaking is livestock numbers and number of farms per district. This will enable calculation of livestock density and other indicators for each district. It would enable a better targeting of policies. The Utilised Agricultural Area (total land area used in agriculture) should also be computed district-wise.

Differentiate between farms operating in residential zones and those outside settlement boundaries

Land is a major constraint for agriculture in Mauritius. Over the years, residential development has encroached upon agricultural land resulting in built-up areas to grow around farms. Environmental legislation and neighbourhood issues have forced many farms out of business. Identifying farms that operate in residential zones is an important piece of information in order to develop a policy for such farmers.

Identification of constraints for the livestock sector

Constraints for the livestock sector could not be separated from the agricultural sector as a whole. Livestock sector constraints are however significantly different from the crop sector.

9.2 Policy Implications of CA2014 data

Analysis of the Census 2014 data for the livestock sector points to several policy implications which are summarised below.

Lack of private investment in certain livestock subsectors

The very low number of private enterprises indicates poor overall investment in livestock. Some subsectors, like poultry and deer, benefit from private investment and have been able to develop over the years into viable industries. Other subsectors do not benefit from the same attention. Household farms which compose the majority of farms are traditional holdings where production is limited by economic and environmental constraints. These holdings have low productivity (low input, low output system) and cannot be counted upon to satisfy the food security needs of the country. Very few of these holdings have been able to grow into medium-scale enterprises that are productive enough to be sustainable.

Policy implications:

(i) It is crucial to attract new investment in the livestock sector particularly in the cattle, goat and pig subsectors. New investment would bring novel technologies and practices that improve productivity and help drive the sector towards new heights. Government should consider fiscal and other incentives to attract such investment.

(ii) It is equally important to help the business of smallholders grow so that they become productive units. Smallholders have the advantage of experience in the livestock production. This experience is a valuable asset that can be converted into productive enterprises. Of course, not all smallholders have the potential to grow. Thus, it is important to classify farmers adequately in order to identify those farmers that have the ability and potential to develop further.

Proper classification of farmers

Till date, there is no national classification for farmers. Every department/ministry has their own classification, according to their needs. As explained above, a proper classification is necessary in order to properly target policies and incentive schemes. Without such targeting, any policies for the livestock sector will not yield desired results and therefore is tantamount to wastage of public funds. Thus, any classification system used should:

(i) Satisfy information needs of all stakeholders of the livestock sector
(ii) Facilitate comparisons between species and regions
(iii) Enable international comparisons
(iv) Facilitate policy-making

Policy implications:

(i) The Ministry of Agro-Industry and Food Security should urgently devise such a classification system and use it for policy-making.
(ii) To facilitate comparisons, it is suggested that the concept of livestock units be used for devising the classification system.

Inadequate local livestock resources and high import dependency

The LU per 100 people of 5.83 is very low and indicates that the country would not be able to satisfy its needs in foods of animal origin should there be a food security threat. A global food price shock such as the one of 2008 is no longer an improbable event. The state of our livestock resources indicates that the country is grossly underprepared for the next price shock. Unlike many other food products, livestock products (meat and milk) cannot be stored for very long periods. There cannot be 'strategic stocks' of livestock products that can be tapped into in times of need. Instead, there should be 'strategic capacity'. The country should build up its livestock production capacity to an acceptable level. A major hurdle in capacity development is the availability of cheap imports which makes local production uncompetitive and unsustainable.

Policy implications:

(i) Government should investigate means to protect the livestock sector from international competition. The livestock sector is a sensitive industry and needs to develop further. Many countries have granted it the status of "infant industry" which enables them to set up protective mechanisms while still being in line with WTO rules.

Lack of market access

For many livestock products, the proportion of sales made directly to the consumer is significantly high. This indicates poor access to more sophisticated marketing channels which serve the higher-end remunerative markets. Livestock farming therefore does not generate enough income to encourage

farmers to be more productive. Since the vast majority of farmers are smallholders, national production itself remains low as a consequence.

Policy implications:

(i) Capacity-building of farmers to enable them to meet the quality standards of remunerative markets is essential. This not only implies training but also improvement of farm buildings and acquisition of equipment. Farmers with the potential to grow should be aided by relevant schemes.

(ii) Set up the regulatory framework to enable certification of farms and livestock products that would open up access to markets. Farmers would then have the possibility of upgrading their farms and management practices to meet these standards.

Unlocking exports

There is very little export of livestock produce. Export markets are very remunerative and can be the driver of the livestock sector if it were accessible. However, even the most capable private sector companies are unable to export their products. The main reason is that the regulatory framework and institutional capacity are lacking. Export markets (e.g. Europe) rely on Government institutions to verify and certify the quality and safety of products that are intended for export. Without the rightly empowered institutions, export markets remain closed to our local production.

Policy implication:

(i) The regulatory framework should be set up to enable institutions to register and audit farms and other establishments to the satisfaction of export markets.

Addressing illegal slaughter

Illegal slaughter is a cross-cutting issue that arises in several of the subsectors. Illegal slaughter has wide-ranging consequences. Since it is carried out in less than optimum conditions, livestock that is illegally slaughtered pose significant food safety risks. Farms practicing illegal slaughter do not respect basic quality norms and health practices. Products are sold usually in blatant disregard for sanitary conditions. This undermines consumer confidence in the end product and therefore bars access to the most remunerative market segments. Illegal slaughter therefore results in a vicious cycle where the farmer's only choice is the lower end of the market. The farmer has less income. There is less investment in management practices which results in disqualification from the higher end of the market.

Policy implications:

(i) Farmers should be encouraged to upgrade their management practices which would enable them to satisfy safety and quality norms required to enter higher end markets. This can be achieved, for example, by having a certification system for farms and farm products.

(ii) A proper, tamper-proof animal identification system should be set up which would accurately identify all livestock. This would render illegal slaughter very difficult as contravening farms would be easily identified.

Strengthening institutional capacity for data collection and processing

The disparity between Census figures and data supplied by various institutions underscores the inability for institutions to collect accurate data on livestock production. Availability of accurate and up-to-date information is critical for implementation of policies and projects in any field.

Policy implications:

(i) Data collection should be formalized and systematized. Field agents (e.g. Extension staff and Veterinary staff) should systematically collect information on farms each time a visit is made. The data should be transmitted in real time through an information system.
(ii) A unit should be set up under the Ministry of Agro-Industry to process information on livestock production and publish monthly reports.

Improve support to budding subsectors

Some livestock subsectors hold a lot of promise as industries of the future. Venison and honey, for example, are products that for which a Mauritian brand can be developed. These products, if appropriately developed, can be marketed internationally with success. Compared to beef, mutton, pork and chicken, venison and honey have a much better chance of carving a niche in international remunerative markets.

Policy implications:

(i) There are only 10 deer farms in Mauritius. It is necessary to popularize deer farming in semi-intensive conditions so that more players can enter the market.
(ii) Support should be geared towards the marketing of the product in order to encourage farmers to upgrade their management practices.
(iii) Regulatory framework should be reviewed to enable export of venison and honey.

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