

Urban-Pig Farming: Easy Gain and Danger to the Environment (Yaounde-Cameroon)

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Abstract:

This article examines the problems of pig-breeding in the human environment. It highlights the economic importance of pig-breeding in income generation in the urban and suburbs of the city of Yaounde. The study was carried out in six months on 201 farms in the urban and sub-urban areas of Yaounde and revealed that stakeholders in this activity focused on the economic importance while ignoring environmental problems. Pig-breeders originated from different geographic origin and men (75.0%) were highly involved. Pig breeding was common in suburbs than in urban settings with a statistical significant difference ($P < 0.05$). It was found in the urban site that most pig breeders were from Nkoabang (12.93%) with 9.38% animals per farm, while in the suburbs, most of them were from Obala (31.34%) with 43.72% animals per farm. This activity is particularly criticized by the media and the Cameroonian public for many drawbacks. Some of the major pitfalls included pollution i.e. sound and waste. The article points out the necessity to handle the conflict between breeders and non-breeders. This participatory approach appears to be an important element in the development of the urban planning system.

Keywords:

Cohabitation, Environment, Urban, Pig, Yaounde-Cameroon

1. Introduction

Like most Central African countries, Cameroon has chosen to focus on small-scale urban and peri-urban farming in rapid succession with the city market. This breeding comes second after the urban market gardening [1]. This activity is considered as a secondary occupation and is practiced by independent breeders (Taxi-men, merchants and civil servants) where men and women of various ages and geographical origins from the West, Center and North-West of Cameroon are involved. Majority of other animals reared in urban areas include: chicken, goat, rabbit and sheep. Dieumou et al., [2] highlighted the importance of pig farming in Cameroon, where projections on its growth shows that it generates up to 30,000 tons of meat per year with a projected 40,000 tons in 2016 and 45,000 tons by the year 2020. Several authors have equally highlighted on the importance of urban and peri urban agriculture and livestock

farming especially pig rearing in food security of individuals of different backgrounds [3,4].

However, the lack of follow-up and the non-application of the institutional mechanism especially planning, have led to the development of pig farming in urban areas. This breeding began in the city of Yaounde. It should be noted that interest in livestock farming increased in the 2000s and national consumption was 202kg/inhabitants/year [5]. The excitement was due to the high demand for pork meat which is a source of protein and it is used in certain traditional ceremonies. The city of Yaounde has a large pool of pork meat consumers. There are three to five barbecues at each crossroads with large number of customers visiting such points in the evening.

For economic reasons and despite the problems caused by this farming in urban areas, some farmers have developed rather small-scale pig production in residential areas of the capital city of Cameroon. However, the administrative authority has little role in organizing urban swine production and supplying consumers. The breeders are active enough to take the initiative themselves [6,7]. The study of Fall et al., [7], Longtene and Koussou [8] and Ndébi et al., [9] reported that livestock farming in urban and peri-urban areas is a function of reduced available space and the objectives envisaged by the breeders.

This poorly placed activity releases foul odors in the urban environment and creates neighborhood conflicts. It is also strongly criticized for the social acceptability of livestock farming which often symbolizes the negative impacts associated with animal production [10,11]. Due to the nuisance it causes, pig-breeding is particularly criticized by the media and the Cameroonian public because it often generates tension between breeders and non-breeders who often end up in law-courts. The objective of this study was to highlight the current practices of pig breeding in the city of Yaounde and the various nuisances it causes such as odor, noise, waste etc. This urban breeding is considered as “unhealthy” and provokes the proliferation of mosquitoes that swarm in waste from pig farms. This study wants to highlight on pig breeding and the environmental effects as well as its difficulties in urban and suburbs of Yaounde.

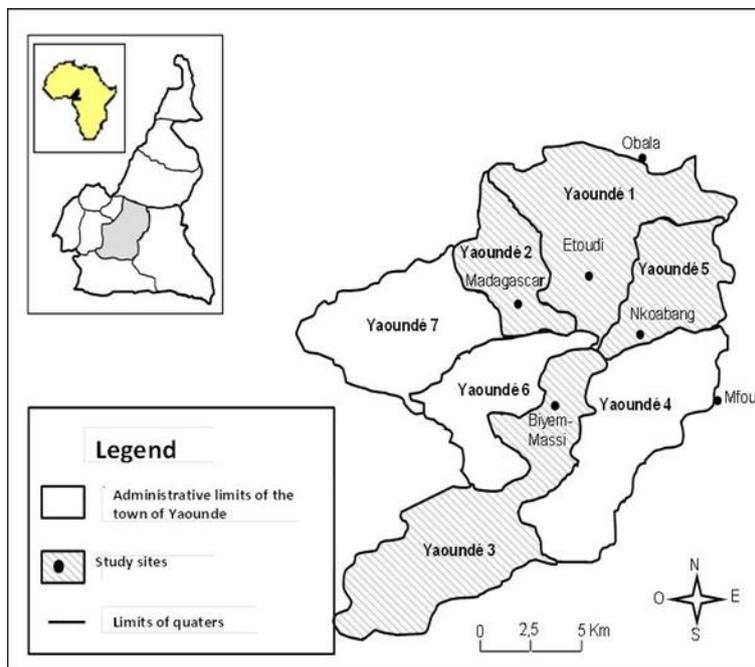
2. Materials and Methods

The survey was conducted in 201 pig farms located in Yaounde town (Etoudi, Madagascar, Biyem Massi, Nkoabang) and in 82 to 119 farms located in the suburbs (Obala and Mfou). In total, 1800 registered pigs were considered. Geographically, the city of Yaounde is situated slightly above the equator between Latitude $3^{\circ}47' - 3^{\circ}56'$ North and between Longitude $11^{\circ}10' - 11^{\circ}45'$ East (Figure 1). It is a Sub-equatorial city and records an average precipitation of 1600mm/year, average temperature of 23°C (Figure 2) and four seasons.

Soils are of the red ferralitic type, but vary as such: ferralitic soils evolved in the plateau and colluvions/alluvium in the valleys. The vegetation of Yaounde is a typical shrub-transitional-vegetation. This zone has a non-uniform precipitation distribution which decreases towards the North West region of Cameroon (1481mm). It has a population of 2 million and a rate of urbanization from 37.9% to 48.8% between 1987 and 2005 [12].

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Source: Mfemou A, (2014)

Figure 1. Urban and peri-urban area of Yaounde.

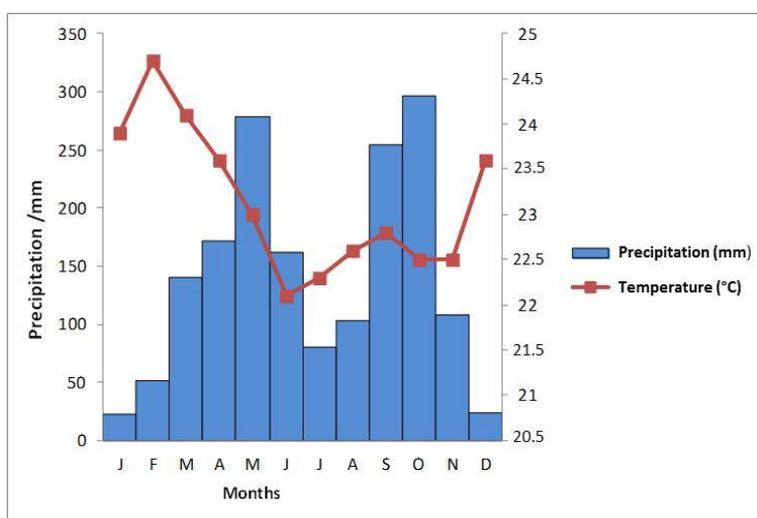


Figure 2. Ombrothermal curve of the Center region (Yaounde).

2.1. Data Management

Questionnaires were administered to the various breeders with questions coined around their motivations and orientations for this type of farming in the study sites. The problems faced by pig breeding in the various study sites was recorded through direct interviews and observations. The other variables observed in this study concerned the demographic information related to the subject such as sex, age, level of education, main activity, region of origin of the respondents and the number of animals per farm. After data collection and observations, the data was processed using the Excel spreadsheet program. The JASP 0.8.5.1 was used to construct boxplots to

represent and compare the breeders, number of pigs per farm with type-locality (suburb and urban). The chi-square test was used to test the significant differences in the proportion of breeder turnover as well as the animals per farm in the type-localities.

3. Results

3.1. Demographic Information on Pig Breeding

While respecting the breeding techniques, farmers faced difficult moments of intense rain during six to eight months of the year. These rains sometimes caused physical damage to livestock. Parasites are more frequent and swine fever often wreaks havoc. Pig breeders used veterinary products for treating and preventing pigs from diseases. Moreover, at the end of the dry season, livestock farms suffer from lack of water for the regular maintenance of pig farms. Breeders are sometimes forced to dig water wells at their residents to feed the animals and to allow easy cleaning of the pig fences, leading to sludge deposits in the vicinity of such fences.

The type of pig farming, geographical location and breeding size was noted. In the study area, the four (04) urban districts (Etoudi, Madagascar, Biyem-Massi, Nkoabang) and two peri-urban areas (Obala and Mfou) practiced two types of pig-breeding systems and at least one of them was encountered in the 201 farms sampled i.e. ground-farming system (Figure 3), stilt-breeding system (Figure 4) and block-house breeding style (Figure 5).



Figure 3. Ground farming system in a pig farm in Madagascar [1].



Figure 4. Pig rearing on stilts (Suspended wood-fences) in the Madagascar [1].

These breeders are from different geographical origins with a greater fraction (80%) being non-native farmers. Pigs of the latter generally came from the Western and Northwestern regions of Cameroon. The average age of farmers was between 30 and 40 years with majority of them being men (75%). Those with a certain level of

education applied better production techniques. Breeding was sometime carried out on stilts with reduced surface area. Some farms were made in marshy areas (Figure 3) while others were attached to the walls of living houses. The size of pig farms ranged from five to ten pigs and around two to three animals in small farms (Table 1, Figure 6).



Figure 5. Pig fence associated with house of individuals in Madagascar, Yaounde [1].

Table 1. Pig breeders and the number of animals per farm in the study sites.

Sites	Proportion of breeders (%)	Proportion of the number of animals per farm (%)
Urban		
Etoudi	6.46	3.72
Madagascar	8.95	8.50
Biyem Massi	12.43	6.72
Nkoabang	12.93	9.38
Suburbs		
Obala	31.34	43.72
Mfou	27.86	27.94
Total	100	100

Source. Survey of 201 farms in the urban and suburbs of the city of Yaounde [1]

There was a statistical significant difference ($P < 0.05$) in the proportion of animals per farm (Figure 6) and number of breeders (Figure 7) in the different type-localities. It was observed that a high proportion of pig breeders resided in the suburbs as compared to urban areas and this could be linked to the limited space for the activity in the urban sites as compared to suburbs.

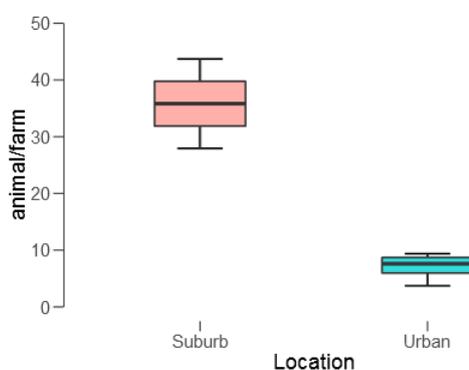


Figure 6. Proportion of pigs per farm in the different locations.

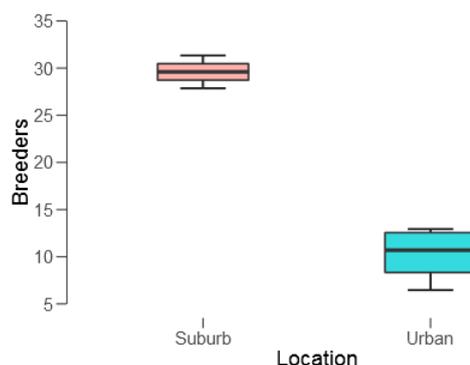


Figure 7. proportion of pig breeders in the different locations.

The study found that high demand for pork meat in roasting spots located at each cross-road in Yaounde makes it possible to understand the motivations of breeders in this activity. The number of breeders increased with the number of animals reared. The peri-urban zone had a high rate (60%) of breeders as compared to the urban. The percentage differences in breeding in the different geographical locations can be likened to the availability of land since there is the scarcity of land in towns than in the suburbs.

Breeders find a reason for rapid proximity to cities in order to facilitate access to the city pork merchants. But because of low urban land tenure, pig-breeders tend to breed on stilts or on the ground (5 to 10 animals) with rapid gain i.e. 200 000 Fcfa/animal on average as well as easy transportation to town-market. But this activity poses real problems such as the interaction of pigs with humans, leading to an epidemiological situation known as zoonosis. The study of Zoli et al., [13] in Cameroon revealed that pig meat transmits *Taenia solium* to humans.

3.2. The Development Challenges and the Parasitic Pressure of Pig Production in Yaounde

Urban planning indicates that pig farming has no place in urban areas and such claims have led to its marginalization. On the contrary, its expansion in Yaounde emanates from the will of farmers and not from the policy of town planning. Urbanization and the problems it poses in the maintenance of pigs especially the odor it produce are enormous. For the breeders, pig breeding generates a rapid income in the urban markets through the supply of live animals to satisfy the consumers. Others say pigs also produce a lot of fat, which is part of the traditional food of the people of South Cameroon. The study found that several breeds are reared: local breeds, exotic breeds (Large White, Danish and Berkshire) and crossbreeds.

The negative impacts of this breeding are more visible and cause neighborhood conflicts. These effects endanger the breeder who is also subject to the risk of contamination by parasitic diseases. During interviews, no breeder was reported to be sick because of this activity. Parasitic and virus infections were reported to be abundant during the rainy season and dry season. Some parasites tend to be endemic (ascariasis, cysticercosis, scabies, lice etc). The intensity of swine mortality (0.83%) recorded was mostly caused by the capacity of breeders to master the techniques of breeding. Dead animals were not reported to the veterinary service. Public authorities talk about clandestine breeding and threaten to penalize such breeders.

3.3. Pig Rearing and Environmental Problems

From our study, the number of pigs differed from one breeder to another in terms of size and according to the available urban space. We observed that the increase in breeding developed multiple problems such as noise produced by the animals [14,15,16]. The use of water to clean excrements and urine in pig fences goes to neighboring houses. These effluents affect surface water and groundwater by creating smelling sludge. This environmental pollution often emits gases when the sun hits them. These gases are of concern to neighbors. Examples of such gases emitted from pig waste include: carbon dioxide (CO₂), ammonia (CH₃) and carbon monoxide (CO) which are very dangerous to human health [17,18]. The effects of pig breeding to individuals in urban and peri urban areas have already been documented by Strom et al., [16]. The water from such pig fences favours the proliferation of water and soil parasites of public health importance (Table 2). The administration pays little attention to the pollution and noises produced from pig farms in the city of Yaounde, which often provoke neighborhood conflicts. Instead, municipalities are interested in pollution related to non-agricultural activities [plastics (non-biodegradable)].

Table 2. *The gaseous pollutants emitted from the pig breeding system.*

Chemical composition	Production	Environmental impact
Carbon dioxide	Degradation of micro-organisms found in faeces	Greenhouse effect, poisonous etc.
Odors	Microbial degradation of animal dropping caused by anaerobic bacteria	Foul odors, Nuisance etc.
Ammonia	Animal dropping	Disrupts the ecosystem, generates respiratory diseases etc.

Source: Survey of 201 farms at the border and urban areas of Yaounde [1]

3.4. Types of Urban Conflicts Caused by Pig Rearing

The rejection of urban pig rearing by non-breeders is obvious due to the nuisance and pollution caused by this activity [13,19]. It was observed that local policies favoured economic than social development. Thus we observed the absence of urban planning texts that prevented the rearing of pigs in the city. The lack of text increase the trauma and developes conflict between the different breeders and their neighbors.

Conflicts between breeders and their neighbors are caused by the polluting gases emitted by the urban breeding system. The environmental risk assessment entities seem to rule-out the ban on pig farming in urban areas, but the law of noise is applied in case of nuisance. It appears that the neighbors regularly complain of foul odors and nuisance of the pigs that cause conflict between breeders and their neighbors. We recorded three (03) cases of lawsuits in court in Yaounde because of the smell and noise of this activity. Overall, non-breeders perceive urban pig rearing as an embarrassment for the residential area. Risks associated with the use of veterinary products have been reported to be of public health concern [20,6].

3.5. Conflicts Between Breeders and Urban Pig Bandits

The study revealed that pig stealing is a common problem among breeders. We recorded five (5) cases of pig theft during the study. Theft is more frequent during the holiday period. Stealing mostly occurred during heavy rainfall. Breeders often lay hands on bandits during or after the activity.

4. Conclusion

The text on town planning does not allow the establishment of pig breeding in urban areas. Municipal action plans to prohibit the practice of urban pig farming. In cities, this activity is carried out by taxi men, traders and civil servants. The common nature of the activity in the city is proof of the lack of control of the activity in the area. The nuisance caused by this activity are numerous and of yet not been solved. Urban livestock (poultry, goat and sheep) activity is linked to a set of socio-economic conditions [16]. Thus, pig is bred in town by cheating. In urban areas, intensive livestock farming systems require the use of water for cleaning. Residues of veterinary products may contaminate groundwater. Conventional livestock farming remains favorable for pigs and not for urban areas.

Conflicts of Interest

The authors declare that there is no conflict of interest regarding the publication of this article.

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