

A SURVEY OF LIVESTOCK STRUCTURES IN SOUTH WESTERN NIGERIA

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ABSTRACT: A survey involving the use of structured questionnaires and personal communication was undertaken in South Western Nigeria to identify the livestock in the area, and their housing methods. Chicken, pigs, rabbits, goats, sheep and cattle were the major animals found while the housing structures include baskets, battery cages, deep litter houses, cages, hutches, pens, sheds and yards. In about half of the sites surveyed animals kept were not provided with housing, while in the other places where they were provided the structures were poorly equipped and overstretched to cope with the population of animals kept. Wood products are the predominant materials of construction accounting for as much as 50 to 70% of the total volume of materials used in the construction of some of these structures. Others are natural fibres, concrete, wire mesh and corrugated roofing sheets. Poor waste management, decay in wood members, and pitting and cracking of concrete were some of the flaws identified. Integrated designs to reduce the burden of waste collection and increase its effective utilization, use of durable timber species and preservative treatment to further improve the length of service, and the use of good quality concrete constituents and mixture are recommended.

I. INTRODUCTION: Livestock, as domesticated animals, are kept by human beings on whom they depend substantially for protection and provision of food and shelter. The art of domesticating animals dates back to 10,000 B.C. [1] when, as a result of increasing human population, hunting became inadequate as a source of supply of animal products required by human beings for food. The initial objective of domestication was therefore to increase the supply of those animal products that served as food. This has now expanded to include the supply of industrial and agricultural raw materials. Tangential to these is the provision of source of employment and income, social and sporting activities, and beasts of burden. If the animals had to satisfy the expectations of human beings in the provision of these products and services, an environment that would ensure maximum productivity of the animals was important and hence the need for livestock structures.

Livestock structures are facilities, either primarily designed or remodelled, to house animals with the aim of providing them with physical well-being, health, comfort, longevity and enhanced productivity. Livestock structures which have metamorphosed from very crude to highly sophisticated forms vary, depending on climatic environment and animals to be housed. The advent of animal housing has greatly improved the quality of animal products and services, and reduced the drudgery of animal husbandry. Animal housing ensures that the animals are kept in a place and provided with feed and medical attention thus eliminating the daily routine of long trek in search of food, if not sheltered, during which a substantial part of the energy from the feed consumed is dissipated. Undissipated energy for sheltered animals is used in body building and improvement of the quality of products and services. The sheltered animals are protected from weather hazards, pilferage and predators. Because the husbandman treks less, he has more time to attend to other activities on the farm and the job is less laborious.

South -Western Nigeria falls under the influence of a warm, humid tropical climate, which is characterised by high temperatures with maximum values ranging from 27°C in July/August to 37°C in February/March. The

area experiences a bi-modal type of rainfall, with annual precipitation ranging from 1450mm to 1570mm for places such as Ibadan [2]. The natural vegetation is the tropical rain forest but long periods of human activities have deforested many parts of the area, replacing them with derived savannah, especially towards the Northern part. The climate and vegetation of the area favour the survival of many types of animals especially the trypanosome-resistant ones, and with adequate housing, these could be raised on a large scale to meet the requirements of the populace within and outside the area.

The survey work reported in this paper was undertaken to evaluate the extent of availability and suitability of the existing livestock structures in South Western Nigeria and recommend ways of eliminating any inadequacies that may be identified.

2. METHODOLOGY: This survey was carried out in a portion of South Western Nigeria comprising Ekiti, Ogun, Osun and Oyo States. Information gathering was accomplished through the use of structured questionnaires which sought information on the type of animals kept, population and housing facilities, materials from which the structures are constructed, problems experienced with the use of the structures and identification of areas requiring intervention. Additional information items were gathered through personal communication and on-the-spot assessment while administering the questionnaires.

A total of 150 locations were used for the survey. These were evenly spread over the area and cut across private commercial farms and households (62%); government farms (25%); farms for teaching, research and educational institutions (10%), and livestock markets and transit points (3%).

3. RESULTS AND DISCUSSION: As summarized in Tables 1 and 2, the major livestock found in the area are chicken, pigs, rabbits, goats, sheep and cattle. Although a few of the private commercial farms keep a high population of as much as 10,000 chicken, the bulk of the aggregated chicken found in the area is in the households.

The livestock structures found in use in the surveyed area include palm frond woven baskets, deep litter houses and battery cages for chicken, hutches for rabbits and pens, sheds and yards for pigs, goats, sheep and cattle.

Table 1: Major Livestock in South Western Nigeria and their Housing Methods

Animal	% of Survey sites where animal was found	Population range of animals kept per location	Areas where majority of the animals are kept	Housing methods
Poultry (Chicken)	62	150-5000	Private commercial farms and households	Palm frond woven baskets, battery cages, deep litter houses
Pig	19	5-150	Private farms and households	Pens, sheds yards
Rabbit	18	10-100	Mainly government and a few private farms	Hutches
Goat	17	5-50	Private farms and households	Pens, sheds, yards
Sheep	10	6-35	Private farms	Pens, sheds, yards
Cattle	7	50-100	Government farms, Teaching and Research Institutes	Sheds and yards

These structures are analysed on the basis of availability and capacity, efficiency of materials of construction, and management.

There were identified some moderate attempts at providing viable livestock structures in government-owned farms, in a few of the large-scale commercial farms and in Teaching and Research Farms of Universities. The household farms

which contain over 75% of the livestock are making no worthwhile attempts in this direction. Animals kept in households are either not provided with any housing at all or are provided with poor-quality housing. There were observed some goat keepers each with animal population of up to thirty, providing no structure to house the

animals. The goats are herded to the owners' backyards where there is not even a shed to protect the goats from rain. The best that some goat owners tolerate is to allow the goats to occupy verandas and corridors only during hazardous periods, including inclement weather.

The use of garages as poultry houses is very popular. Poor ventilation in these garages results in heat stress and reduces the gain in body weight per feed consumed.

In about half of the sites surveyed, standard livestock buildings were provided but about one-third of such buildings were poorly equipped in terms of facilities such as lighting, feed and water troughs, and waste-handling methods. In the two-thirds that were adequately equipped the facilities were, in most cases, overstretched to cope with the population of animals kept. This tends to defeat the objectives of providing the structures as overcrowding increases the chances of disease outbreak and spread. Sainsbury et. al [3] reported increased mortality rate and reduced gain in body weight per feed consumed for animals accommodated under such conditions. Inability to acquire, rather than the lack of awareness, is responsible for the non-provision of appropriate livestock structures by the households. With very little capital at their disposal, it is considered more economical to invest it on more animals rather than sharing it between a few animals and good livestock structures.

The materials used for the construction of livestock structures in the area of study are grasses, palm fronds, bamboo, timber, concrete, wire mesh and corrugated iron roofing sheets. Because timber and the technology to work it are readily available in the area of study, wood products are the most commonly used materials of construction for livestock structures. It accounts for between 50 and 70% of the total volume of the materials of construction in most structures. Wood products, either as plywood or solid wood, are used for the construction of walls, elevated floors and feed troughs (Plates 1 & 2). Solid wood is used for beams, columns and roof trusses. The use of non-durable timber species and lack of preservative treatment either before use or while in service were observed in some places. These lead to deterioration while in service. There were incidences of

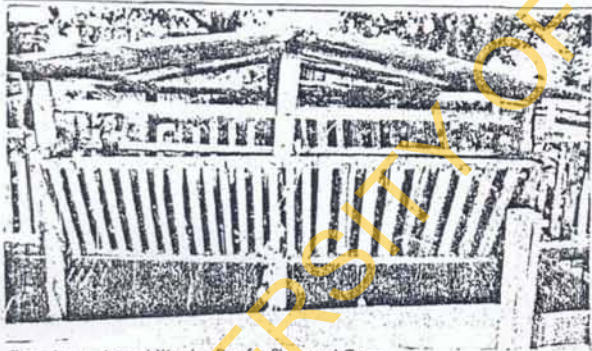


Plate 1: An elevated Wooden Pen for Sheep and Goats.

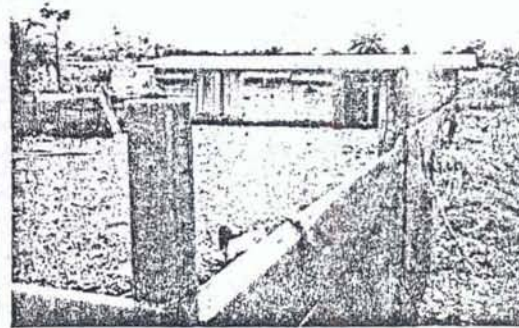


Plate 2: A yard/shed for Sheep and Goats.

structural failure of wood frames in some of the buildings caused by animals such as pigs and rabbits gnawing on the frames and, in some cases, by the animals leaning heavily on the wooden frames.

Pitting and cracking of concreted floors were traced to the use of inferior quality aggregates, lean mixture as low as 1:3:8 and poor workmanship. These are further aggravated by the foot pressures of animals and action

Table 2

LIVESTOCK STRUCTURES USED IN SOUTH WESTERN NIGERIA AND THEIR MATERIALS OF CONSTRUCTION

Structure	Animals for which Structure is Used	Components of Structure and Materials of Construction
Baskets (Kuku)	Poultry (chicken)	Flat-bottom and arch-shaped housing type of basket woven wholly from fibrous palm fronds. The bigger ones are used for transporting animals
Hutches and Cages	Rabbits and Poultry (chicken)	The frame is made of sawn timber while the walls and floor are made of wire mesh. This is for effective ventilation through the walls and easy passage of faeces/urine through the floor. Corrugated iron sheets, bamboo or thatch could be used for the roof
Deep litter houses	Poultry (chicken)	The floor could be paved or hard compacted soil overlain with a layer of sawdust, wood-shavings or other similar materials. The walls consist of a dwarf portion made from either timber or sandcrete blocks and completed to the eaves with wire mesh. A plastic sheet which can be rolled over the wire mesh is attached for the purpose of temperature regulation. Timber columns and trusses provide a support for the corrugated-iron sheet or asbestos roof
Battery Cages	Poultry (mainly for layers).	Manufactured wholly from galvanized wire mesh to facilitate good ventilation and easy passage of dropping through the floor. They are arranged in steps attached to a metal frame
Low Cost elevated Pens	Goat, sheep	A slatted wooden floor and wall structure with the floor elevated about 0.6m above the ground and supported on wooden columns. The roof is corrugated iron sheet attached to timber truss. Where it is available, bamboo could also be used for the walls and roof
Pens	Goat, sheep, pig	Paved concrete floor for ease of washing, dwarf wall usually of sandcrete blocks but occasionally timber could be used. Pig eat wood and their pens are partitioned with sandcrete blocks. Corrugated iron sheet or asbestos is used for roofing supported by a timber truss
Sheds and Yards	Mostly for cattle but could also be used for goats, sheep and pigs	A yard is usually an expanse of land demarcated with a wire or sandcrete block or wooden fence within which animals may graze while sheds pitched at various locations within the yard protect the animals from harsh weather conditions and provide sleeping places. A typical shed consists of a paved floor and corrugated iron sheet roof supported on a timber column. There may or may not be a dwarf wall made of either sandcrete block or timber.

of their urine which occasionally accumulate due to poor drainage system of the floor.

Animal husbandmen interviewed acknowledge the immense contributions of the available livestock structures in reducing the drudgery of animal husbandry. However, there were complaints about the burden and rising cost of replacing bedding materials especially in deep litter houses. The litter should be changed at regular intervals, in order to avoid the risk of disease outbreak. This regular change of litter is laborious while the current increase in the demand for litter materials as sources of household energy is escalating the cost of replacement.

4. CONCLUSION: The livestock found in South Western Nigeria are in order of popularity chicken, pigs, rabbits, goats, sheep and cattle. Palm frond woven baskets, deep litter houses, battery cages, hutches, pens, sheds and yards are used for housing the various animals found in the area. In about half of the sites surveyed animals kept were not provided with any housing, while in the other places where the structures were provided they were either poorly equipped or adequately equipped but over-stretched to cope with the population of animals kept. Timber is the major material of construction constituting as much as 50 to 70% of the total volume of the materials of construction of most structures. Other materials of construction are natural fibres, concrete, wire mesh and corrugated roofing sheets. Some of these materials have performed quite satisfactorily. Decay in wood members, and cracking and pitting of concrete are some of the problems experienced with the use of these materials. Waste-handling especially in deep litter houses remains a bottleneck.

5. RECOMMENDATIONS:

- Efforts should be made to provide adequate housing for all animals kept. This will increase the economic return of the enterprise and the capital invested on such housing even if obtained as a loan can be liquidated within a short period.
- Naturally durable timber species such as *Lophira alata* and *Mansonia altissima* should be used for construction to curtail the attack of fungi and insects which are the major agents of wood deterioration in service. Wood preservatives such as Wolman salts and zinc chloride which have been reportedly used to extend the service life of timber to between twenty-five and forty years could be used to further extend the service life of the timber components. [4,5]
- The use of good quality concrete constituents, rich mixture such as 1:2:4 and good workmanship during construction will reduce the incidence of cracking and pitting in concreted floors.
- Livestock waste especially from chicken is a potential source of plant nutrients and feed for fishes. It is presently under-utilised. There is the need for improved integrated designs to reduce the burden of collection and effectively utilize it.

REFERENCES

1. Johnson, R.R. (1971). "Agricultural Science (Animal)" in McGraw-Hill Encyclopedia of Science and Technology. Vol. 1. McGraw-Hill Book Company, New York.
2. University of Ibadan Meteorological Station (1997). "Climatic Data for 1985-1995".
3. Sainsbury, D. and P. Sainsbury (1979). "Livestock Health and Housing". Bailliere Tindall, London.
4. Standards Organisation of Nigeria (1973). "NCP 2:1973. The Use of Timber for Construction". Federal Ministry of Industry, Lagos.
5. DeGroot, R. C. and G.R. Esenther (1982). "Microbiological and Entomological Stresses on the Structural Use of Wood: in Proceedings of a Symposium on Structural Use of Wood in Adverse Environments. Roberts W. Meyer and Robert M. Kellogg (eds). Van Nostrand Reinhold Company, New York.