

## The Necessity of Farm Structures in Nigeria

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**ABSTRACT:** Farm structures provide a comfortable and conducive environment to plants, animals, farmers, machineries and equipment. Farm structures provides shelter and conducive environment for the preservation of quality and quantity of plants and crops, increase the productivity of animals and farmers, and ensure safety and good working condition of machineries and equipment. This paper discussed the benefits of farm structures; the types of farm structures like farm houses, livestock structures, crop production buildings, agricultural processing buildings, storage structures, equipment, tools and supplies buildings respectively, and miscellaneous structures and their functions; the problems, challenges and solutions to the challenges faced in farm structures respectively. Farm structures plays important role in agricultural sector and its importance cannot be neglected. It is an area of specialization that is relevant in agricultural engineering field; hence, implementation of the stated solutions to the challenges faced in farm structures should be given priority.

**KEYWORDS:** Farm Structures, Buildings, Environment, Challenges, Benefits.

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### I. INTRODUCTION

Farm structures can be defined as one of the branches of agricultural engineering that deals with planning, design and construction of farm buildings and other structures in the farm and outside the farm environment.

Farm structure involves both shelter and non-shelter, while farm buildings involve only shelter for accommodation of man, livestock and crops. Examples of non-shelter of farm structures are roads, bridges and fences.

There are some structures which may not be found within the farm premises and environment respectively but have functions related with agricultural activities could also be classified as farm structures. Examples of this type of structures are green house, ware house, cassava processing centers, machinery workshops, fruits and vegetables storages.

Farm structures have contributed significantly to agriculture in providing better housing, improvement in transportation and communication respectively, provision of modern conveniences and recreational facilities for good standard of living and working conditions of the farmers. Also, farm structure has brought improvement in productivity of livestock and reduction in post-harvest loss through improvement in animal houses and adequate storage facilities respectively.

There are some structures and facilities which are for other non-agricultural purposes, but were converted or remodelled for agricultural uses, for example, old residential buildings that are converted to crop storage structures or poultry buildings.

Farm structures are classified based on utilization or materials of construction. Construction materials of farm structures are concrete, earth, timber and steel. Although, steel is not a common material in farm building, because of its high cost that may be beyond the purchasing power of most farmers.

The definition of farm structures shows the necessity of farm structures in our nation, hence it is indispensable. It shows that no farm structures means no agricultural development, hence, no nation building.

## II. BENEFITS OF FARM STRUCTURES

**Regulation of the environment:** Environmental factors which are majorly temperature and relative humidity act together to make the environment harsh or conducive. Farm structures regulate temperature and relative humidity of the environment to attain maximum comfort for the farmers, livestock, stored crops and other stored farm products, for example, insulation materials and vapour barriers.

**Protection from physical attack:** Farmers, animals, crops and machinery need to be protected from the hazardous effect of rain, wind and sunlight respectively. The presence of farm structures protect farmers from enemies and carnivores' attack; improve farmers' performance; improve the performance and productivity of livestock respectively; maintain the quality and quantity of farm crops on farm and post-harvest period; increase machine efficiency by reducing rust, wear and tear of machinery components; reduce pilferage against livestock and stored products; reduce and prevent livestock attack by carnivores, reptiles and insects; prevents crops' attack by insect especially crops cultivated in green house.

**Transportation:** Roads, bridges, culverts are means of transportation of goods and farm inputs such as seedlings, agrochemicals, fertilizers, labour, farm machinery to the farm and transportation of farm outputs such as harvested produce, livestock to the villages and urban centers respectively. Farm structures increase the productivity of agriculture of the nation if not neglected.

## III. TYPES OF FARM STRUCTURES AND THEIR FUNCTIONS

- (i) **Farm houses:** They are used for accommodating family members and farm workers in the farm. They provide the necessary convenience, comfort and protection against harsh weather condition. Buildings previously for other purposes but remodelled and renovated to accommodate human beings on the farm are also termed farm houses.
- (ii) **Livestock structures:** livestock structures regulate the environmental factors, which are temperature and relative humidity to the optimum comfort of livestock. Livestock structures reduce drudgery of animal husbandry in searching for food over a long distance. Livestock structure ensures that the metabolism of animals is working effectively, thereby, ensuring the right feeds and water are taken, making the animals look healthy and increase their productive rate. This will bring better returns on the investment on the livestock. Example of livestock structures are battery cage and deep litter house for poultry; hutches for rabbits; barns, sheds, pens, and yards for animals like goats, sheep, pigs and cattle respectively. Example of livestock structures is shown in plate 1.



Plate 1: Battery cage house for poultry.

**Source:** <https://www.google.com.ng/search?q=picture+of+battery+cage+house+for+poultry>

(iii) **Crop production buildings:** These types of farm structures are common for research works on plants. They are used for modification of the plants' environmental condition to environmental requirements of plants, to achieve a desired result. Examples of these types of farm structures are green house, screen house, glass house, and growth chambers. A greenhouse shown in plate 2 is an example of crop production building.



Plate 2: Picture of Green house for crop production.



**Source:** [www.wisegeek.com/what-is-the-difference-between-a-conservatory-and-a-greenhouse.htm](http://www.wisegeek.com/what-is-the-difference-between-a-conservatory-and-a-greenhouse.htm)

(iv) **Agricultural processing buildings:** The buildings provide a friendly environment for the workers' activities at the processing unit. The building should be spacious for aeration and sanitized to make the workers perform the activities in healthy condition. Examples of these types of buildings are abattoir, fish smoking kilns, oil palm and cassava processing unit. An example of agricultural processing buildings is shown in plate 3.



**Plate 3:** Galler cassava processing equipment at cassava processing unit in IITA Ibadan, Nigeria.

**Source:** <https://www.flickr.com/photos/iita-media-library>

(v) **Storage structures:** They retain agricultural produce for a long period of time, thereby retaining the quantity and quality of the stored products. They are able to withstand the pressures of the imposed load from the stored products. Storage structures are always made with materials that are strong, durable and less resistant to corrosion. Example of storage structures are cold rooms, platform, barns, warehouse, cribs, silos and evaporative coolers. Example of warehouse for storage is shown in figure 1.

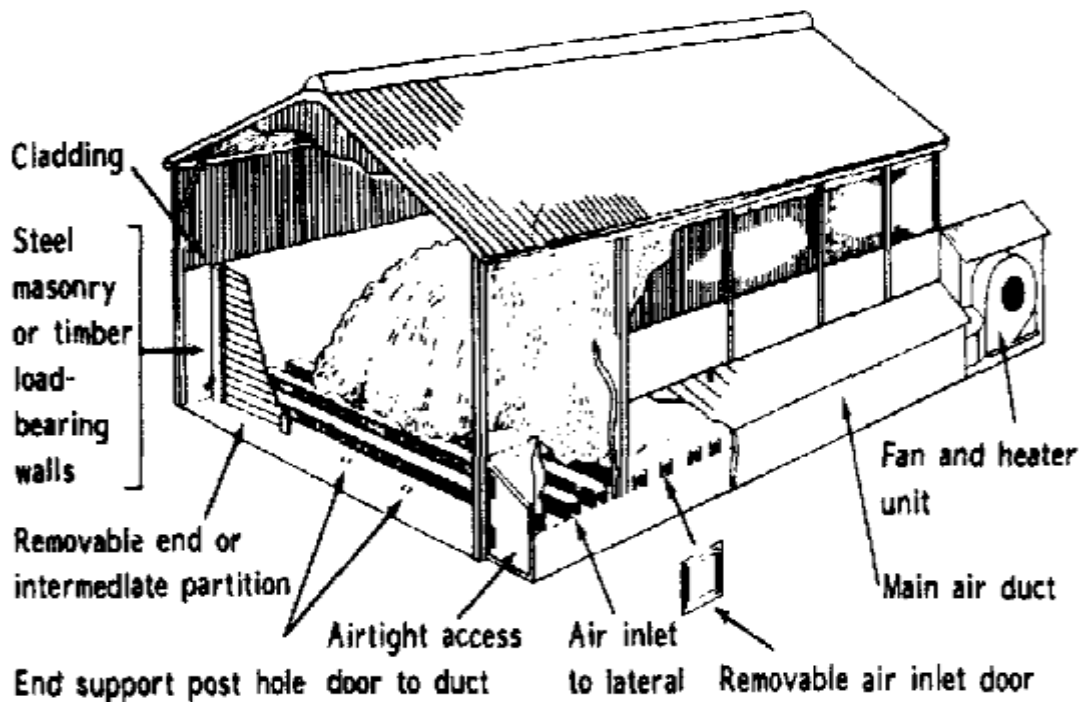


Figure 1: warehouse-type of building with floor drying system

Source: <http://www.fao.org/docrep/x0039e/X0039E04.htm>

(vi) Equipment, tools and supplies buildings: They are used as shelter for packing farm machineries, store for the supplies like fertilizers and fuel brought to farms. Examples of these buildings are fuel depots, garage, farm shops, implement sheds and workshop. Example of these types of buildings is shown in plate 4.



Plate 4: Implements shed

Source: <https://www.sheds.co.nz/rural/implement-sheds/>



- (vii) Miscellaneous structures: these structures are not for habituating human beings, livestock, crop or equipment, but are infrastructures that are necessary in the farms. Examples of these types of structures are bridge, culverts, fence, gates and roads. A structural example is shown in plate 5.



**Plate 5:** Gate of a farm land

**Source:** <https://www.pinterest.com/pin/>

#### IV. PROBLEMS AND CHALLENGES FACED IN FARM STRUCTURES

It is a great concern that Nigeria is still facing food and agriculture problems, and one of the problems in agriculture is in the area of farm structures. These challenges include:

- (i) **Poverty:** This is one of the challenges faced by agricultural farmers in Nigeria. Despite the fact that Nigerian farmers are hardworking and industrious, majority of farmers lack the financial strength to procure the needed farm structure facilities to improve food production.
- (ii) **Ignorance:** An average Nigerian mentality of agriculture as poor people's job and as job meant only for the illiterate rural people general has also affected low interest in the farm structure specialization.
- (iii) **Illiteracy:** Most of the Nigerian farmers lack modern agricultural education. Usage of foreign languages in education has not brought the required improvement in passing information on adapting to better methods of usage and construction of farm structures that can improve agriculture and food productions, because most of our farmers are familiar with our local language.

- (iv) Use of old ancestral method: Many farmers are still addicted to old structures, and are not flexible in adopting to new modern structures that are more durable and function more effectively than the ancestral structures.
- (v) Lack of good roads: Majority of miscellaneous structures like rural roads are at dilapidated condition, with no or little maintenance on them. Hence, it poses set back to agriculture. As reported by Mijinyawa *et al.*, (2005), the pains of the Nigerian small scale farmers are worsening daily because of bad roads, thereby making their farm harvest not getting to the market on time for adequate compensation. A case study of bad rural roads in Nigeria is shown in plate 6.



**Plate 6:** State of rural road in Eha-Amufu community of Enugu state, Nigeria.

**Source:** Ojedelet *et al.*, (2017).

- (vi) Scarcity of structural materials: There are some farm structures, components and materials respectively that are not easily available in the market in time of need. Therefore, scarcity can be a setback to utilization and the development of farm structures. Some of the components for farm structures and facilities that are beneficial to farmers are out of reach, just like how tractor hiring services were rendered impotent because their service could not get to where they are actually needed according to report by Oni (2013), Makanjuola (2004) and Mijinyawa (2017).
- (vii) Government concern: Lack of government support in the area of research and financial support to farmers in purchasing some of these farm structures are hindrances to the usage of many farm structures by farmers for the improvement in good farming activities and comfort to the farmers, animals, crops and machineries.

- (viii) Lack of scientific and technological skill: Many high institutions in Nigeria do not have farm structures' laboratory, therefore, majority of the lecturers and students' knowledge end up to be based only on theoretical aspect of farm structures.
- (ix) Unaccountability: Most farmers do not keep proper record of their farming activities for accuracy and discover their agricultural gain and loss. Improper record of farming activities cannot make farmers to discover where there will be improvement for further research on the type of farm structures used in the farms.

## V. SOLUTIONS TO THE CHALLENGES FACED IN FARM STRUCTURES

- (i) Provision of loans through cooperatives, banks, government, non-government organizations can help the farmers to procure the necessary farm structural facilities needed in farms. In addition, government can also assist farmers through subsidizing some of the imported farm structures for actualization of their target, and also for millennium development goals.
- (ii) Farm structures and materials respectively that are imported can be produced locally to reduce cost of purchase and increase availability of the components in the markets.
- (iii) Farmers should be enlightened through adult education about agriculture.
- (iv) Youths need to be encouraged to be involved in agriculture, as this would improve much interest to farm structure specialization.
- (v) The use of old farm structures may be as a result of rigidity of farmers to old structures or weak financial strength. Farmers should be enlightened to be flexible in adopting and choosing new structures that were originated from research work that have better properties than old ancestral structures through improvement on the old structures.
- (vi) Most of the rural roads are in dilapidated and deteriorating condition. Agriculture would be improved if rural roads maintenance and rehabilitation is given attention.
- (vii) Government should support higher institutions in Nigeria for the construction and supply of laboratories and laboratory equipment respectively, so that there will be practical teaching on farm structures properly. Therefore, theoretical knowledge should be complimented with practical skills.

## VI. CONCLUSION AND RECOMMENDATION

The review on the importance of farm structures to Nigerian farmers shows that farm structures are inevitable; the absence of it means no agricultural growth and productivity respectively. Hence, factors like Poverty; Ignorance; Illiteracy; Use of old ancestral method; Lack of good roads; Scarcity of structural materials; Government concern; unaccountability; Lack of scientific and technological skill respectively that may hinder interest in farm structures for agricultural growth and development should be tackled immediately. If there will be a substantial development in agriculture, farm structures should be of priority to Nigerian farmers and government respectively.

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