

## The Status of Agricultural Equipment Fabrication Industry in Ekiti and Ondo States, Nigeria

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### ABSTRACT

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A survey study of the status of agricultural equipment fabrication industry in Ekiti and Ondo State was carried out with questionnaire distributed in sixteen (16) towns of the two states. Some of the parameters measured were; date of establishment, types of equipment fabricated, workshop ownership, staff strength, staff cadres, mode of training of fabricators, education qualification, years of experience, source of power supply, equipment used, mode of production, source of capital, source of raw materials, registration with professional body, marketing of products. A fully structured questionnaire was administered for the study, which were collated and analysis using descriptive, student t-test and correlation analysis. Out of the fifty (50) respondents 44% were from Ekiti State while 56% were from Ondo State. The result shows that population, infrastructural facilities have effect on numbers of equipment fabrication workshops and marketability of the fabrications. It was also revealed that majority 60% of the agricultural equipment fabricated are small household processing equipment, very few fabricators registered with relevant professional bodies, majority of fabricators personnel were half literate, equipment fabricated do not meet the local demands. The epileptic supply of electricity and high tariff has contributed greatly to the under development of the agricultural equipment fabrication in the state.

**KEY WORDS:** *Equipment, fabrication, workshop, cottage production, agricultural, small scale, established manufacturers*

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### I. INTRODUCTION

Agriculture remains the engine of economic growth and plays a critical role in the entire life of a given economy. Ekiti State and Ondo States in the western region of Nigeria with over 70% of the population engaged in Agricultural production. The modern equipment used in production and processing of Agricultural products are majorly been imported into the country ( Igbeka ,1997), not until late eighties that Nigerians began to look inward for the fabrication of Agricultural equipment from locally available materials.

Government in Nigeria have been making efforts to encourage local production of agricultural equipment but has been faced with some problems. Among these is the fact that industrial scale of agro-based raw materials depend largely on imported technologies and machinery (RMRDC, 1996). Apart from the enormous attendant cost, the issue of unavailability of spare parts for the sophisticated equipment and in some cases relevant manpower to operate and service the equipment have given rise to the need to look inward for locally fabricated equipment.

Onawumi and Jekayinfa (2000) reported that most of the locally fabricated equipment are sub standard and easily prone to corrosion, wear, vibration and subsequently food poison.

The dwindling of the nation's foreign exchange has made the cost of imported machineries, spare parts and skills from overseas exorbitant (Aribisala-1991). This has created an urgent need for concerted effort to indigenise technologies for the exploitation of our natural resources. Apart from established companies like Dizengoff, John Holt, Hagco and few others, who assembles imported components of tractors and other machines. There exist today many fabricators including local blacksmiths with varying level of educational background, training, equipment possession and financial capabilities The production of any equipment or machinery require the use of appropriate technology, man power, raw material and finance (Ogazi and Aliyu,1991) Raw material Research and Development Council (RMRDC) in 1989 carried a survey in Nigeria to identify those equipment and machinery that have been designed and fabricated locally, the survey revealed that

about 500 individual enterprises engaged in the activities, and are geographically spread all over the country. However about 80% of the enterprises are located in the southern states. The equipment manufacturing exist in three categories namely established, cottage-level and the road side (Ogazi and Aliyu, 1991)

#### **Categories of Fabrication Workshops.**

- (a) **Road side/Cottage Level Fabricators:** These are fabricators who have very small workshops, mostly welders. It either attached to their houses or by the road side.  
The equipment produced are common household crop processing equipment such as burr mills, knife, pepper grinder and small agricultural handling implements. The workshop are characterised with small portable welding accessories which are portable and could be transported away after the close of the day's work. The fabricators in this category do not make use of detailed working drawings for the equipment fabricated. It was also observed that majority in the category are semi or stack illiterates. 76% of the fabricators observed fall under this category.
- (b) **Small scale fabricators:** These fabricators are a little more advanced than road side fabricators in the area of working machineries and calibre of workers they possess. Detailed drawings are being used for the production of equipment. The owner/workers are fairly educated and teachable. Their products are more than ordinary household processing equipment. Nine or 18% of the workshops are in this category.
- (c) **Established fabricators:** The fabricators in this category are well trained, with better equipped workshops. They produce better products which could stand side by side with imported agricultural equipments. Work equipment such as lathe machine, Shaping machine, hi-tech welding machine etc are found in their workshops. Three (3) or 6% of the workshops could be found in the two states.

Government have played a vital role in accelerating engineering development in Nigeria by establishing some organisations to promote the development of small medium scale industries in Nigeria (Aderoba 2000). These organisations include:

- i. Industrial Development centre (IDC) established in many of the state capitals to assist small scale industries with feasibility studies and technical advice.
- ii. Technology Business Incubation Centre(TBIC) to nurture the start and expansion of small and medium scale enterprises in Nigeria
- iii. National office for Technology Acquisition and Promotion (NOTAP) for promoting the acquisition of appropriate foreign technology required for facilitating the technological and industrial development.
- iv. Rural Agro-industrial Development Scheme (RAIDS) to develop appropriate technology to process agro products.
- v. Engineering Materials Development Institutes (EMDI), Akure. The mission is to develop engineering process that can be duplicated and mass produced by entrepreneurs.
- vi. National Centre for Agricultural Mechanization (NCAM), Ilorin with the aim of developing locally fabricated agricultural equipment.

There is therefore the need to establish the status of equipment that are fabricated for Agricultural operations with the aim of improving their performance in the area of the nation where 70% of the population engage in Agricultural production.

## **II. METHODOLOGY**

### **Plan of survey area**

The survey was conducted in Ekiti and Ondo States in the South Western part of Nigeria where over 70% of the population depends on agriculture for their livelihoods. Well structured questionnaires were distributed to the functional Agricultural equipment fabricators in the selected area. The study was limited to Ekiti and Ondo States in the South western part of Nigeria so as to get to all the possible categories of fabricators in the study area.

### **Background of Ekiti State**

Ekiti State is one of the 36 states in the Federal Republic of Nigeria with abundant and good agricultural base. Over 70% of the population depend on agriculture for their livelihoods.

Ekiti State is located between longitudes 5°15' and 5.250° East of the Greenwich meridian and latitudes 7°40' and 7.667° North of equator covering an area of 6,353 kilometres square. The state has a population of 2,737,186 people according to the estimated National Population Census (NPC) of 2006.

### Background of Ondo State

Ondo State is one of the states in the Federal Republic of Nigeria with abundant and good agricultural base. Over 70% of the population depend on agriculture for their livelihoods.

Ondo State is located between longitudes 5 °05' and 5 .083° East of the Greenwich meridian and latitudes 7°10' and 7.167° North of equator covering an area of 15,500,000 kilometres square. The state has a population of 3,440,000 people comprising 1,761,263 males and 1,679,761 females.(NPC, 2006).



Fig. 1 Map of Nigeria showing States.

### Survey data collection

Questionnaire were produced and distributed in sixteen (16) towns in Ekiti and Ondo States out of which 50 copies were completed and returned representing. On the spot assessment of the various fabrication workshops were made.

### Collection and analysis of data

Descriptive statistic (frequencies and percentages) data analysis was used in the data collected from the respondents. Also the student t-test was used to compare some of the data obtained from the states for determining level of significant different.

The model is given as:

$$T\text{-test} = \frac{|\bar{X}_1 - \bar{X}_2|}{\sqrt{S^2P \left[ \frac{1}{n_1} + \frac{1}{n_2} \right]}} \dots\dots\dots(i)$$

Where  $\bar{X}_1$  = Means of data obtained from Ekiti State.

$\bar{X}_2$  =Means of data obtained from Ondo State

$S^2P$  =Painted Variance

$n_1$  = Total number of respondent in Ekiti State

$n_2$  == Total number of respondent in Ondo State

$$S^2P = \frac{(n_1-1)s_1^2 + (n_2-1)s_2^2}{(n_1+n_2)-2} \dots\dots\dots(ii)$$

$S_1^2$  = Variance of data obtained from Ekiti State

$S_2^2$  = = Variance of data obtained from Ondo State

The parameter s compared for significant difference ( $P \leq 0.05$ )

Correlation statistic was also used to express the degree of association between variables such as type of equipment produced, form of ownership, staff strength, source of power supply, mode of training, types of equipment used and capital source.

The correlation model is given as;

$$r = \hat{\beta} \frac{S_x}{S_y} \dots\dots\dots(iii)$$

Where  $\beta_1$  = Least square slope

$S_y$  = Standard deviation of y

$S_x$  = Standard deviation of x

When  $r \longrightarrow 0$  little or no linear relationship

$r \longrightarrow 1$  or  $-1$  Strong relationship

### III. RESULT AND DISCUSSIONS

Questionnaires were distributed in sixteen communities in both Ekiti and Ondo States, out of which fifty (50) copies were returned. Twenty-two (22) copies or 44% from Ekiti State and twenty-eight (28) copies or 56% returned from Ondo State as shown in table 1. Some of the parameters measured are; date of establishment, types of equipment fabricated, workshop ownership, staff strength, staff cadres, mode of training of fabricators, education qualification, years of experience , source of power supply, equipment used, mode of production, source of capital, source of raw materials, registration with professional body, marketing of products etc.

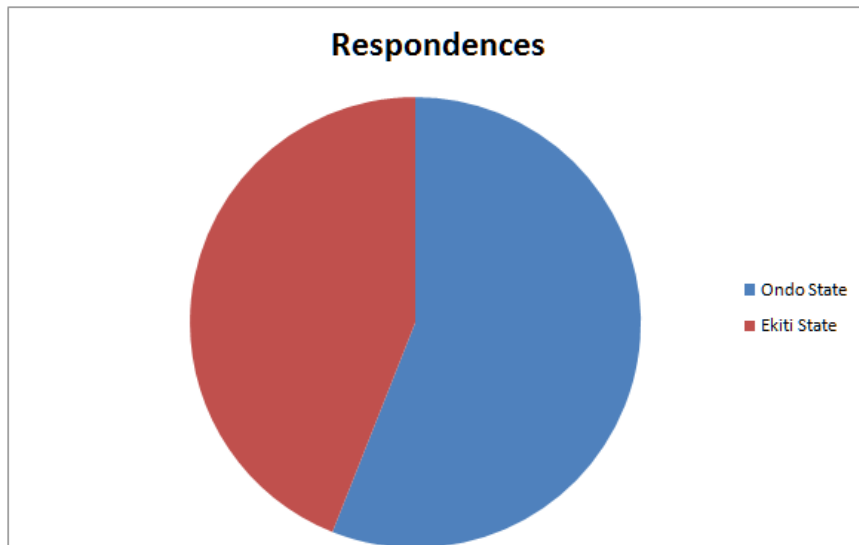


Figure 2. Number of Respondents

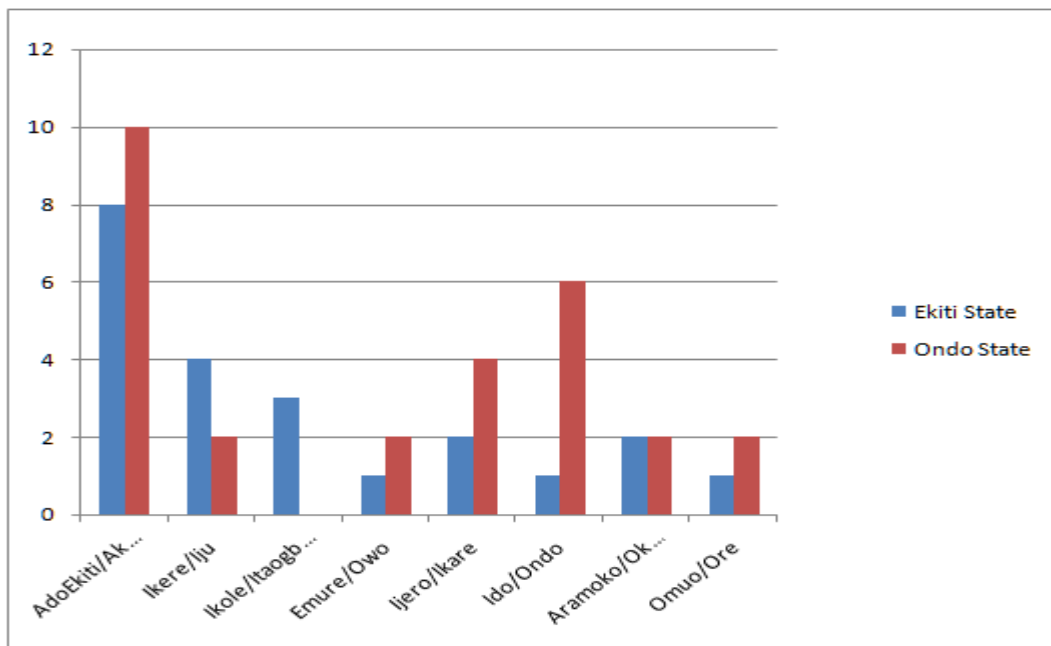


Figure 3. Respondents per Community.

One could observe from the results that there are more fabrication workshops in the state capitals and other big towns in the two states. The reasons could be traced to the followings:

1. Large population: The number of fabrication workshop is synonymous to the population of the community
2. Improvement in infrastructure facilities: Infrastructure facilities such as electricity, pipe born water, good roads which are far better in the cities and towns contributed to the increase in the number of fabrication workshops.
3. Road Marketability: Large population aids the sales of fabricated products.
4. Cheap publicity and display of goods by the road sides by the fabricators.

## **Correlation Analysis of Results**

**Correlations analysis of result at 5% level of significance in table (2) shows that:**

- (i) There is strong relationship between form of capital source and the type of equipment used, capital source and the type of equipment produced. The development (positive or negative) effect on the type of equipment produced.
- (ii) There is no strong relationship between staff strength, power supply and the type of equipment produced. The implication is that increase or decrease in any of parameters (staff strength, power supply) may not affect the type of equipment produced.
- (iii) There is strong relationship between mode of training of the fabricators, type of equipment used, capital source and form of ownership. A new development in form of ownership of the fabrication workshops may have effect on the other parameters.

## **CONCLUSION**

In the study of the status of agricultural equipment fabrication in Ekiti and Ondo States part of the south western states of Nigeria. The following conclusions were deduced:

- i) Majority (60%) of the agricultural equipment fabricated are small household processing equipment.
- ii) Very few of the fabricators registered with appropriate professional body (COREN). Hence many of their products are substandard.
- iii) Metals which are the major raw materials for fabrications are readily available in the country.
- iv) Three categories of agricultural equipment fabrication workshops were identified in the two states namely
  - Road side/cottage workshop which form 76%
  - Small scale workshop
  - Established manufacturer
- v) The epileptic supply of electricity and the high tariff has contributed greatly to the underdevelopment of the agricultural equipment fabrication. The high cost of fuel to operators and the scarcity worsen the situation. Nigeria is a country where electricity are not supplied by the expected consumers paid.
- vi) Majority of the fabrication personnel are literate or half-literate. However, they are not properly trained in the act of equipment fabrication. Training and retraining of these workers are required for better performance.
- vii) Among the staff cadres, females were not common. They were only used as cleaners and secretaries in few workshops. This could be attributed to the stressful nature of the job and the hazard involved.
- viii) The equipment fabricated do not meet the local demands.
- ix) There are yet many agricultural equipment such as land preparation, spraying and harvesting equipment that are not being produced in the area under investigation.

## **RECOMMENDATIONS**

Based on the study the following recommendations are being made:

- i) Government should provide enabling environment for the establishment of agricultural equipment fabrication workshops. These involve infrastructural development (Road, pipe borne water, improvement in electricity supply).
- ii) Establishment of equipment fabrication training school where all interested school leavers can undergo well structured training programmes before taking up the vocation. This will go a long way in reducing unemployment in the country.
- iii) Government should sponsor collaboration with developed countries for technology transfer in the area of equipment design and fabrication.
- iv) Fabricators should expose themselves to new scientific and technical developments so as to ensure sustain developments of their capacities.
- v) Fabricators should register with relevant engineering bodies and attend related seminars and workshops where latest technologies could be discussed.
- vi) Fabricators should provide after sales- services to their customers.
- vii) They should document their design parameters with a view to ascertain performance specifications, machine life, and aesthetics and cost effectiveness in manufacturing.

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