



ACTIVITY BASED CLASSIFICATION ANALYSIS OF SACHET TABLE WATER PRODUCTION ENTERPRISE IN GOMBE STATE, NIGERIA

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ABSTRACT

The study examined the activity based classification (ABC) analysis of sachet table water production enterprise in Gombe state, Nigeria. A random sampling technique was used for the study. Gombe Central enterprises, Gombe South enterprises and Gombe North enterprises were purposively selected. In the study area 45 production enterprises were selected from Gombe central, 15 production enterprises from Gombe South and 10 production enterprises were selected in Gombe North. The total sample size used amounted to 70 enterprises. The data were analyzed using ABC analysis with the aid of quantitative management software. The results revealed that Gombe Central (group A) generated ₦41.18 million/annum with average (₦2.06 million/annum); (group B) ₦6.11million/annum with average (₦0.32 million/annum) and group C generated ₦9.81 million/annum with average (₦1.63 million/annum). Gombe South (group A), ₦2.29 million/annum with average (₦0.20 million/annum) and group B, ₦8.49 million/annum (₦2.12 million/annum). Gombe North (group A), ₦0.51 million/annum (₦0.12 million/annum) and group B, ₦1.49 million/annum average (₦0.24 million/annum). The sum of ₦57.1 million/annum with an average of (₦0.81 million/annum) was generated in Gombe central; Gombe south generated the sum of ₦10.78 million/annum, average (₦0.71 million/annum) and Gombe North generated the sum of ₦2 million/annum, with an average of ₦0.20 million/annum. This implies that in Gombe State sachet table water production enterprises generated ₦69.88 million/annum with an average of (₦0.99 million/annum). There were more experienced managers in Gombe Central followed by Gombe South then finally Gombe North. With regards to inventory, the enterprises that fall under group B were 19 where each enterprise had 30% of items in the inventory which generated 15% of the total income invested in the enterprise annually, where ₦6.11 million/annum was realized in group B with an average of ₦0.32 million/annum. The study recommended that the people in Gombe State should engage in sachet table water production because it will improve the productivity of the citizens and the country at large.

Keywords: Activity, Based, Classification, Enterprise, Production, Sachet and Water.

INTRODUCTION

Water is the most abundant substance in nature and occupies about 70% of the earth's crust (Anyamene and Ojiagu, 2014; and Thliza, *et al.*, 2015). Due to its natural abundance and because the protoplasm of many living cells contain about 80% water and most biochemical reactions which occur in the metabolism and growth of living cells involves water medium it is considered a universal solvent. Water is food, because food is any substance which when ingested through the mouth will nourish the body to sustain life (Sites Power Dubai Courses [SPDC], 2017). It is a biological medium which exists as solid, liquid and gas. Importance of



ample water quantity for drinking and other purposes was apparent to our ancestors while an understanding of drinking water quality was not well known or documented. (Thliza *et al.*, 2015).

Water is a necessity, a resource and at the same time a major contributory factor in the contamination or pollution problems. Its importance to life, therefore, can never be overemphasized, as it encircles life all round. To maintain good health, water must be kept safe and free of contamination of any type. Good drinking water supply to Nigeria’s teeming populace is a perennial problem that has defied solution (Omoniyi and Abu, 2012). As such, it has often attracted rhetorical commentaries with little or no practical solutions. Therefore, great concern must be given to the quality of drinking water as it is very critical for the overall socio-economic development of any society and, should engage the attention of individuals, groups, government and non-governmental organizations (Omoniyi and Abu, 2012).

The ABC-Analysis deals with a simple method of material classification that concerns value and quantity. It is a well-established categorization technique based on the Pareto Principle for determining which items should get priority in the management of a company’s inventory (Handanhal and Ram, 2014). Generally, it can be expressed as a process which identifies the important kinds of customers, suppliers or articles. Pareto principle indicates that the following is valid for many phenomena: 80% of effects are reached by 20% of causes. The conceptual framework of Activity-Based Classification (ABC) is based on multiple criteria approach of modern ABC analysis. ABC Analysis is based on Pareto Analysis which says 20% of the items contribute to 80% of sales. It implies that a small portion of items in Inventory contribute to maximum sales. Typically less than 20% of items classified as A, contribute as much as 80% of the revenue. The next 15% contribution to revenue is done by B class Items. The last 5% revenue is generated by items classified as C’ (Ching-Wu *et al.*, 2008).

MATERIALS AND METHODS

The Study Area

Gombe state is located between latitude 9°12’ and 12° 30’N; longitudes 8°45’ and 11°45’E of the Greenwich Meridian. It lies within the Northeast region of Nigeria and occupies a total land area of about 20,265km². Open and close ended structured questionnaires were used for the study.

Sampling Techniques

The sample size was determined by Taro Yamane’s formula, for a finite population. This model was adopted from Titus *et al.* (2008) due to the nature of the population which was definite. Gombe Central, Gombe South and Gombe North were the senatorial zones selected for the study based on the density of the production enterprises in the Gombe State. The list of the 45 sachet table water production enterprises in Gombe central; 15 in Gombe south and 10 in Gombe north was generated and used as a sampling frame. The sample size was estimated using the Yamane’s (1967) formula:

$$n_{mgt} = \frac{N}{1+N(e)^2} \dots (1)$$

where;

n_{mgt} = sample size of the production enterprise in Gombe State.

N = total number of the functional sachet table water production enterprise in the list generated.

e^2 = error term (0.05²)

The total number of enterprises in the research work was 70 sachet table water production enterprises. The formula used for the classification was obtained using the following parameters that were considered in each inventory in the sachet table water



production enterprise: total consumption during the reference period (quantity/annum) or (q/p) and unit value in the reference period (₦/annum) or (v/q). Based on these parameters the usage value of an inventory was determined as mathematically as presented:

$$VI_k = q_k \cdot v_k \text{ (₦/p)} \quad \dots (2)$$

where;

VI = Usage value (₦)

k = Sachet table water production enterprise

q = Quantity

v = Value (₦)

₦ = Naira (Nigerian currency)

p = 1 year (reference period)

The sachet table water enterprises were listed according to their usage value in decreasing order which gives allowance to define the total cumulate value which was mathematically presented as:

$$VC_k = \sum_{i \leq k} VI_i \text{ (₦/p)} \quad \dots (3)$$

where;

VC = Cumulative value

k = Sachet table water production enterprise

Σ = Summation

i = Inventory

VI = Usage value

₦ = Nigerian currency (Naira)

p = 1 year (reference period)

The percentage of the total cumulative value of the sachet table water production enterprise was calculated as follows:

$$VC_k \% = \frac{VC_k}{VC_n} \times 100 \quad \dots (4)$$

where;

VC = Cumulative value

k = Sachet table water production enterprise

n = Total usage value of all the sachet table water production enterprise

RESULTS AND DISCUSSION

Activity Based Classification (ABC) Model

A typical analysis of stock items could be classified based on annual consumption as Class A, Class B and Class C. ABC analysis is based on Pareto principles (20% - 80%, 15% - 30% and 5% - 50%) rule. Table 1 shows the categorization and summary of activity based classification (ABC) analysis that indicated the cumulative annual value of an inventory in naira, cumulative percentage of annual value and the category assigned to each sachet table water enterprise in the study area.

Twenty (20) enterprises out of 45 sachet table water enterprises as presented in Table 1 were found to be under class A based on categorization considering the managerial abilities of the enterprises based on Pareto principles of 80-20%. The implication of this is that the enterprises in the study area had tight inventory control under more expert management, type of record was accurate and complete, the frequency of review was continuous, had low safety stock and more frequency reorder in order to maximize profit. Also, 20% of items in each and every enterprise had contributed to 80% of the revenue generation of that particular enterprise.



This is in line with Flores and Whybark (1987), who stated that enterprises that fall under class A category of 80–20% most have attention of the top management (expertise).

Table 1: Categorization and Summary of ABC Analysis of Sachet Table Water Enterprises

Zones	No. of Enterprise	Category			% of Items in Inventory			Total Money Value (millions (₦))/annum			Total Money Value/annum (%)		
		A	B	C	A	B	C	A	B	C	A	B	C
GC	45	20	19	6	20	30	50	41.18(2.00)	6.11(0.32)	9.81(1.63)	80	15	5
GS	15	11	4	0	20	30	0	2.29(0.20)	8.49(2.12)	0(0)	80	15	0
GN	10	4	6	0	20	30	0	0.51(0.12)	1.49(0.24)	0(0)	80	15	0

Note: GC = Gombe Central, GS = Gombe South, GN = Gombe North; Value and numbers in brackets are average.

Table 1 also shows that enterprises that were found to be under class B category of 30-15% were 19 out of the 45 enterprises in the study area. This implies that the enterprises should have medium attention for control with the monitoring of potential evolution towards items of group A or in the contrary towards items of group C. The degree of control was moderate, type of record was good, frequency of review was occasional, moderate safety stock and reorders was moderate also. This is in line with the report of Malhotra (2015) and MMICPS (2015), that enterprises that were categorized under class B with 15–30% were under moderate attention for control with potential evolution towards items of group A and otherwise towards items of group C.

Table 1 also present that 6 out of 45 sachet tables water enterprises were found to be under class C category of 50-5% based on Pareto principles. This implies that the sachet table water enterprises were under a minimum attention and under simple observation. The degree of control was loose, with simple record keeping and less frequency reorders. This agreed with Liu and Huang (2006), view that a simple and minimum attention is enough in enterprises that were categorized under class C. The research findings found that most of the sachet table water enterprises in Gombe Central were managed well. The resources were effectively utilized considering the number (20) of enterprises that were under class A in the study area and that of class C (6) that were not managed well and that of class B that had 19 enterprises moderately managed. Sachet table water production is profitable in the study area considering the mean years of experience (4 years) of the production enterprise. There was good and experienced management that ensured that the resources were used to maximum advantage in turns maximum profit. And this might be the reasons of continuous entry into the market; most of the enterprises were newly established indicating that many entered the enterprises in recent years. Considering the educational status of the producers as having 35% tertiary level of education; others with one level of education or the other while none was illiterate and the enlightenment on entrepreneurship that has being going on. Individuals in this group have the tendencies to engage themselves in such enterprise that is not as tedious as farming in the farm.

As indicated in Table 1, in Gombe south 11 sachet table water production enterprises were found to be under class A category of 80-20% out of the 15 that were selected. The implication was that the enterprises were managed with tight inventory control under highly experienced management with accurate and complete record keeping, the frequency of the review was continuous, low safety stock level and the reorder was more frequently. This is in line with CGMM (2015) who stated that those enterprises that fall under class A category of



80–20% needs stringent attention of the top management (expertise). It also shows that the remaining 4 enterprises were under class B category of 15-30% base on Pareto principle. This implies that the enterprises were controlled with medium attention, which means that the degree of control was moderate; type of record was good, with occasional review, moderate safety stock and reorders. It was further reported that there was no class C of 5-50% the enterprises in Gombe South were utilizing their resources more effectively. The implication was that. Also, they had more qualified managers than that of Gombe Central. Considering the category of classes (A and B) the enterprises in the study area belong to. And this might be attributed to the consciousness on production activities that they had with experience on farm management, since almost all the populace in that area were agrarians and had better educational background than those in Gombe Central. This is in line with Akerele and Oyebanjo (2014) who reported that education is an important factor that makes an individual to have a sense of recognition and utilization of investment opportunities. It is also in line with Kolo *et al.* (2015) who had the view that years of experience have a positive effect of an individuals' managerial ability, decisions, perception and understanding of socioeconomic factors affecting farm activities.

The result in Table 1 further shows that in Gombe North 4 enterprises out of the 10 selected enterprises in the study area falls under class A category of 80-20%. And this implies that the enterprises were managed with tight supervision under more experienced management, accurate and complete record keeping, continuous review, low safety stock and more frequent records. While the other six (6) enterprises were found to be under class B category of 15-30% based on Pareto principles of 80-20 rule. This indicates that the enterprises had a moderate degree of control, had a monitoring of potential evolution towards class A or on the contrary toward class C. The type of record was good, frequency of review was moderate and the reorder was moderate also. The implication of the result of Gombe North was that people in that area were farmer and are backward in education which contributed to their commitment on the sachet table water production as an easiest enterprise that can generate income than farming which is more tedious. Considering their mean age which was 53 years; household size was 13 person/household with the dominance of men indicating that they are the active age and responsibilities being the breadwinners in the study area. This might attribute to their commitment in the managing of the enterprise in order to generate more income to sustain their family. This is in line with Bakari *et al.* (2015) who opined that in most households men were the headed and they had to earn more in order to carter for the family.

Table 1 presented the categorize and summarize of the percentage of items in the inventory, total money value and the percentage of total money value of enterprise using the 80-20 rule of Pareto analysis. The result (Table 1) revealed that 20 enterprises in Gombe Central (GC) were in group A. Those enterprises were the ones that had 20% of items in inventory which generated 80% of total income in the enterprises and the total money value of ₦41.18million/annum was released with an average of ₦2.06million/annum. The enterprises that fall under group B were 19 where each enterprise had 30% of items in the inventory which generated 15% of the total income invested in the enterprise annually, where ₦6.11million/annum was realized in group B with an average of ₦0.32million/annum. Meanwhile, Group C had only six (6) enterprises where each had 50% of items in inventory which contributed 5% of the total money generated and ₦9.81million/annum was realized as revenue generated with an average of ₦1.63million/annum. The results (Table 1) also showed that in Gombe South (GS) 11 enterprises were in group A. Those enterprises had 20% of items in inventory which contributed 80% of total money value and the total money value of



₦2.29million/annum was generated with average (₦0.20million/annum). The enterprises that fall in group B were 4 where each enterprise had 30% of items in the inventory which consumed 15% of the total money value invested in the enterprise annually, while ₦8.49 million/annum was realized as total money value for the whole enterprises in group B with an average of ₦2.12million/annum. The Table 1 also showed that in Gombe North (GN) 4 enterprises was in group A. Those enterprises had 20% of items in inventory which contributed to 80% of total money value and ₦0.51million/annum was generated with average (₦0.12million/annum). The enterprises that fall in group B were 6, and each enterprise had 30% of items in the inventory which contributed to 15% of the total money value invested in the enterprise annually, while ₦1.49 million/annum was realized with an average of (₦0.24 million/annum) as total money value for the whole enterprises in group B. Sachet table water production enterprises in Gombe central (GC) generated ₦57.1 million/annum with an average of ₦0.81 million/annum. Gombe South (GS) generated ₦10.78 million/annum, average (₦0.71 million/annum) and Gombe North (GN) generated ₦2 million/annum, with average of ₦0.20 million/annum. This implies that in Gombe State sachet table water production enterprises generated ₦69.88 million/annum, with an average of (₦0.99 million/annum).

CONCLUSION AND RECOMMENDATIONS

The viability of sachet table water production was revealed and evaluated in this study. Sachet table water production in Gombe Central was profitable. There were more experienced managers in Gombe Central. The citizens of Gombe State should engage in sachet table water production because it is a profitable venture. Therefore, the study recommended that the consumers and or people of Gombe State should engage in sachet table water production because it is a profitable venture, it will improve the productivity of the citizens and

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