

# Analysis of Post-Harvest Handling Techniques of Tomato in Batagarawa Local Government Area, Katsina State Nigeria

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## ABSTRACT

This research was conducted in Batagarawa Local Government Area of Katsina State to analyse the current post-harvest handling techniques of tomato. Five wards were purposively selected from, the ten wards of Batagarawa Local Government Area. The wards were Ajiwa, Bakiyawa, Batagarawa, Dabaibayawa, and Yargamji. Ten structured questionnaires were randomly administered to the tomato farmers/handlers from each of the selected ward, which gave a total of fifty tomato farmers/handlers as the sample for the study. The data generated were carefully analyzed using simple descriptive statistics (frequency and percentages). Result obtained indicated that 70% of the tomato handlers/farmers had acquired education below tertiary level. The result also showed that 74% of the tomato handlers/farmers harvested tomato when it was ripe. The packaging materials used were Geza and Raffia baskets (60 and 80% respectively). The result also showed that 46% had transportation problems which were due to poor rural roads. Seasonality was identified as the primary causative factor of tomato spoilage.

**Keywords :** Post-harvest, Handling, Tomato, Batagarawa, Katsina State, Nigeria

## I. INTRODUCTION

Tomato (*Lycopersicon esculantum*) is vegetable staple fruit and it has become an important cash and industrial crop in many parts of the world (IAR & T. 1991). In Nigeria alone, a total area of one million hectares was reportedly being used for its cultivation (Anonymous, 1989, Bodunde et al. 1993). Despite the positive achievement made in increasing food production at the global level approximately half of the third world countries populations do not have access to the adequate food supplies. There are many reasons for this, one of which is food losses occurring in the post-harvest and marketing systems (FAO, 2002). Among the major factors responsible for post-harvest produce losses include poor pre-harvest measures and adoption of poor production techniques (Mujibu et al., 2007). Also, responsible are non-application of pre-harvest recommended treatments, harvesting at improper stage, dumping produce, moisture condensation, and packaging in bulk without sorting or grading, poor storage, distance and timely distribution to markets (Mujib et al., 2007). These losses brought low return to the growers, processors, traders and the country at large

may suffer regarding foreign exchange earnings (Kadir, 1992).

In 3<sup>rd</sup> world countries like Nigeria where most of the tomato and other vegetable production is done by poor farmers or small-scale farmers, storage, packaging, transportation and handling techniques are poor (Mbuk et al., 2011). Post-harvest activities were highlighted as one of the determinants of food problems in most developing countries like Nigeria (Ojo, 1991, Babalola et al., 2010).

This reason that encouraged the interest of the researcher in conducting this kind of research is identifying the problems that are likely to be encountered in tomato post-harvest handling and look for possible solutions to the associated problems.

### A. Objective of the study

The aim of the study was to analysed the post-harvest handling techniques and losses of tomato in Batagarawa Local Government Area of Katsina State.

## II. METHODOLOGY

An open-ended structured questionnaire was used to generate the survey data from the tomato handlers/farmers. The researcher asked several research questions. The questions were:

- a. What are the socio-economic characteristics of the tomato handler/farmers?
- b. What are the preventing post-harvest practices in the study area?
- c. What kind of packaging materials used by the farmers/handlers?
- d. What are their means of transportation for farmers/handlers of tomato?
- e. What kind of problems faced by the farmers/handlers during the post-harvest period?

### A. Study Area

The study was conducted at Batagarawa Local Government Area of Katsina state. The Area is located in the North-western part of Nigeria; it has a population of 184,575 people (NPC, 2006). It lies between latitude  $12^{\circ} 54' N$   $7^{\circ} 37' E$  with longitude  $12^{\circ} 9' N$   $7.617^{\circ} E$ . The people of the area are predominantly farmers. Crops grown mostly in the area are millet, sorghum, and cowpea. The species of animals in the area are cattle, sheep, and goats. The main annual rainfall is between 600mm-900mm per annum and an average temperature of  $35^{\circ}$  to  $42^{\circ}C$ , and it has a total land area of  $433km^2$  (weather in Africa, 2011).

### B. Sampling Techniques and Sampling Size

The purposive sampling procedure was used to select five wards from the ten wards in the area of study. The wards were; Ajiwa, Bakiyawa, Batagarawa, Dabaibayawa and Yar'gamji. Ten tomatoes handler/farmer was drawn randomly from each of the five wards selected. These gave the total of fifty tomato handlers/farmers as that provided the total sample of the study.

## III. DATA ANALYSIS

The data generated from this study were summarized and analysed using simple descriptive statistic which includes only frequencies and percentages.

### Results and Discussions

Table 1 revealed that 60% of the tomato handlers/farmers fall within the age range of 31-40

years, this is considered to be the active labour force (KTARDA, 1998). It also showed that 100% of the tomato handlers/farmers were males and 92% of them were married, this finding is in agreement with the results obtained by Garba et al. (2012), which states family responsibilities as the reason they engaged into farming. The result also revealed that over 60% of the tomato handlers/farmers had a family size of more than 15. On literacy level, a vast majority of the tomato handlers/farmers 70% had a level of education lower than tertiary level, while only 12% had tertiary education. This implied that majority of the tomato handlers/farmers had a lower level of education, but at least they can read and interact with customers. This agreed with the findings of Garba et al. (2012) that literacy helps farmers and handlers of food and vegetables in using modern post-harvest techniques.

Table 2 showed that 52% of the tomato handlers/farmers had up to 15 years of experience in the tomato business. This implied that the farmers level of experience showed that they were infinite in the system and so the information obtained from them was an actual manifestation of the farming system. This tallied with the findings of Olayemi et al. (2010) in their study on assessment of the post-harvest constraints faced by small-scale farm holders of tomato, bell and hot pepper in some local government areas of Kano state, Nigeria. The study revealed that the farmers level of experience shows that they are vast in the system and so the information obtained from them is mostly an accurate reflection of the farming system. The study also revealed that 27% of the tomato handlers/farmers harvest their tomato when it is ripe. Clearing is the post-harvest practice employed 80% by the tomato handlers/farmers. The study also revealed that 80% of the tomato handlers/farmers use palm baskets in packaging their tomato and also 80% of the tomato handlers/farmers uses medium sized baskets.

Table 3 showed the distribution of tomato handlers/farmers based on means of transportation, transportation problems, and causes of tomato damages. The result revealed that 48% of the tomato handlers/farmers transport their tomato in cars, lorry or van. The study also showed that poor roads 46% are the major problems of transporting tomato. The study also revealed that seasonality is the primary causative factor of tomato damage.

**Table 1.** Biodata of the tomato handlers/farmers

Parameter	Frequency	Percentage
<b>Age</b>		
20-30	5	10.0
31-40	30	60.0
41 and above	15	30.0
<b>Total</b>	<b>50</b>	<b>100</b>
<b>Sex</b>		
Male	50	100
Female	0	0.00
<b>Total</b>	<b>50</b>	<b>100</b>
<b>Marital status</b>		
Married	46	92.0
Single	4	8.0
<b>Total</b>	<b>50</b>	<b>100</b>
<b>Family size</b>		
1-5	6	12.0
6-10	8	16.0
11-15	7	14.0
16-20	17	34.0
21 and above	12	24.0
<b>Total</b>	<b>50</b>	<b>100</b>
<b>Educational background</b>		
Primary	25	50.0
Secondary	10	20.0
Tertiary	6	12.0
Quranic	9	18.0
<b>Total</b>	<b>50</b>	<b>100</b>

**Table 2.** Experience stage of harvesting, Time of harvest, past harvest method employed and Baskets used for packaging

Parameter	Frequency	Percentage
<b>Years of Experience</b>		
1-10	12	24.0
11-15	26	52.0
16 & above	12	24.0
<b>Total</b>	<b>50</b>	<b>100</b>
<b>Harvesting Stage</b>		
Ripe	36	72.0
Unripe	14	28.0
<b>Total</b>	<b>50</b>	<b>100</b>
<b>Time of harvest</b>		
Anytime	8	16.0
Morning	25	50.0
Afternoon	7	14.0
Evening	10	20.0
<b>Total</b>	<b>50</b>	<b>100</b>
<b>Post-harvest practice employed</b>		

Cleaning	40	80.0
Grading	15	30
Sorting	2	
<b>Total</b>		

Table 3. Means of Transportation, Transportation problems and Causes of damage

Parameter	Frequency	Percentage
<b>Means of transportation</b>		
Animal cart	8	16.0
Bicycle	3	6.0
Motorcycle	15	30.0
Car, lorry, van	24	48.0
<b>Total</b>	<b>50</b>	<b>100</b>
<b>Transportation problems</b>		
Mechanical breakdown	14	28.0
Poor roads	23	46.0
Delay in getting vehicle	6	12.0
Use of passengers vehicle	7	14.0
<b>Total</b>	<b>50</b>	<b>100</b>
<b>Damage causes</b>		
Distance	10	20.0
Seasonality	33	66.0
Low demand	7	14.0
<b>Total</b>	<b>50</b>	<b>100</b>

#### IV. CONCLUSION

#### VI. REFERENCES

The study showed that post-harvest handling techniques mainly employed by the farmers/handlers were clearing. Seasonality was also found to be the significant causes of tomato damage.

#### V. RECOMMENDATIONS

- To harvest at the unripe stage so that by the time consumers will use the tomato will be at complete stage of ripeness which will reduce the post-harvest loss
- The harvesting should be done in the morning so that it can be purchased and consume before the crop damage.
- The method of packaging the tomatoes should be improved from the traditional Raffia Geza to the other techniques that will prevent the bruises and cut-off the tomato surfaces.
- The government can assist in reducing the post-harvest losses by constructing good roads for easy transportation of the farm product.

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