

*Full Length Research Paper*

# Awareness and effectiveness of vegetable technology information packages by vegetable farmers in Adamawa State, Nigeria

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Dry season vegetable production plays a key role in agricultural economics of Adamawa state, as a basic source of food, income and employment especially for resource poor farmers. This study evaluates the awareness and effectiveness of agricultural technology information by dry season vegetable farmers in Mubi region. Findings revealed that the vegetable production is gender sensitive to the male sex. Most household depend on family as a reliable source of labour. Awareness was high for vegetable production information packages. The farmers indicated the need for agricultural extension services, the dearth of which limits achieving high productivity. The use of mechanized land preparation techniques was less effective among the farmers interviewed. Vegetable technology information as seed dressing, availability of improved seeds, planting methods, weeding, water and disease management, pest control, harvesting and use of fertilizer were found to be very effective among the farmers. This could influence positively vegetable production in the study areas. The low effectiveness rating for mechanized land preparation and water management practices may be associated with the complex and expensive nature of these technologies.

**Key words:** Dry season farming, agricultural technology information, complex technology, effectiveness, awareness.

## Introduction

Vegetable (leafy and fruits) are widely cultivated in most parts of sub Sahara Africa, as a cheap and reliable source of protein, vitamins, zinc and iron. They constitute between 30% and 50% of iron and vitamins A in resource poor diet. Vegetable production in Nigeria is characterized by use of crude implements, non availability of inputs (Mofeke et al., 2003), illiteracy, expensive and complex technologies. In the north eastern Nigeria production is noticed under rain fed and constantly inundated soils. Dry season production of vegetable in Adamawa state is common along the banks of rivers that cut across cities and towns, inundated lands closer to cities or towns characterize by high population density (Sabo and Adeniji, 2007). Dry season vegetable production has been on going for decades providing employment and income for the increasing population during the prolong

dry season. However production is constrained by inadequate infrastructure, agronomic and socio-economic variables. This manifest as reduced number of practicing vegetable farmers and yield. The benefits of improved technology to agricultural development are realized in terms of increase farm output, higher income, and improved standard of living (Hart et al., 2005). To some extent, dry season vegetable farmers may or may not be aware of vegetable production technologies. The effectiveness of these technologies is imperative for adoption and consequently increased yield and income. Its ineffectiveness may be associated with a high cost and complex technologies.

Michika, Mubi north and Madagalli local government area serves as hub for vegetable production, they provide fresh vegetables to residents of Mubi region (Mubi, Michika, Madagalli, Maiha) and Maiduguri metropolis (Borno state). This study is important because vegetable cultivation is profitable; besides dry season vegetable farmers are on the increase. The contributions of vegeta-

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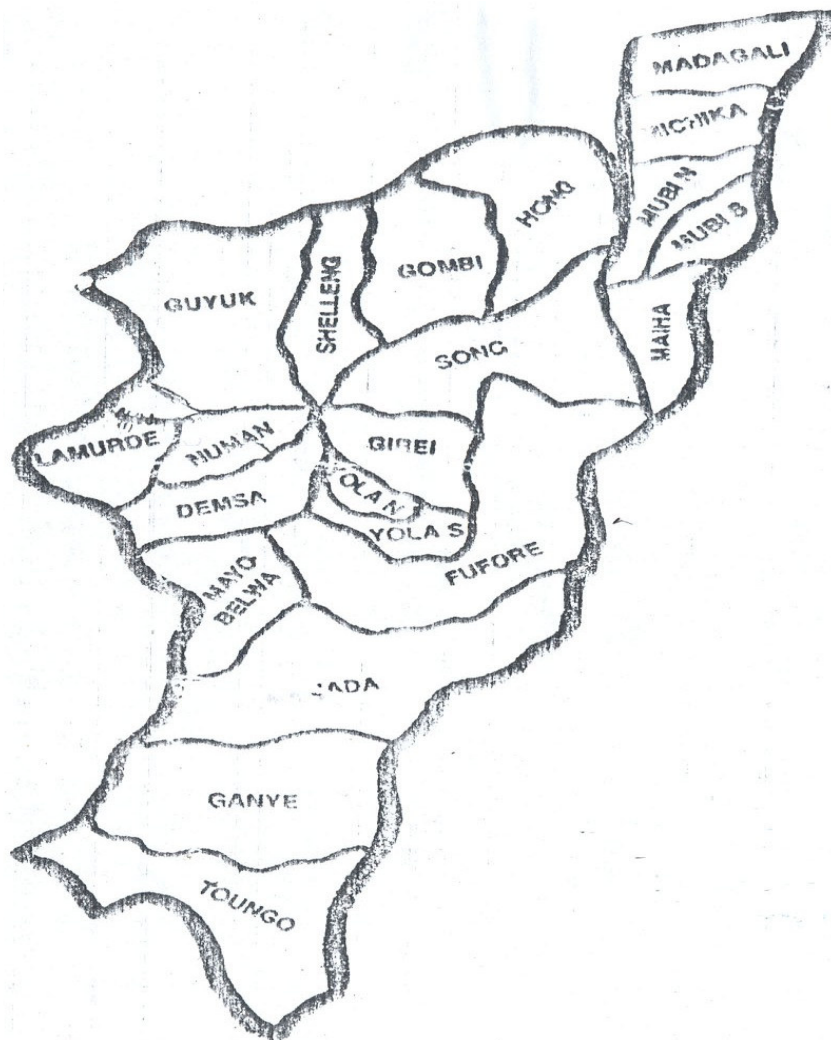


Figure 1. Map of Adamawa state showing the study area.

ble production to the Gross Domestic Product (GDP) have been recognized. But research information on the effectiveness of dry season technology information packages is limited as compared with cereals and legumes. An accomplishment of this study will assist resource poor farmers and extension personnel in providing ameliorations where limitations are encountered. This study intends to determine the socioeconomic characteristics of vegetable farmers and evaluate their awareness of and effectiveness of dry season vegetable technology information.

#### Hypothesis

Ho=No similarities exist among socioeconomic characteristics of dry season vegetable farmers.

Ha=Similarities exist among socioeconomic characteristics of dry season vegetable farmers.

#### METHODOLOGY

A multistage sampling procedure was adopted for the study. Three

(Figure 1) were purposively selected due to high number of dry season vegetable farmers and preponderance of dry season vegetable production activities. From each local government, two districts Michika and Bassa, Gulak and Duhu, Mubu and Ba'a, Guda and Mugulvu form Michika, Madagalli, Mubi north and Mubi south local government respectively. The survey was carried during the 2005/06 and 2006/07 dry season vegetable production. For 2006 evaluation, one hundred and seventy dry season vegetable farmers were interviewed. While in 2006/07 evaluation one hundred dry season vegetable farmers provided information for the study.

#### Personal Characteristics:

**Age:** Age of the respondents was measured by asking them to provide their actual age in years.

**Marital Status:** Marital status of the respondents was determined local government areas namely; Mubi, Michika and Madagalli by asking them to indicate the most appropriate option that reflected whether they are married, single, divorced or widowed.

**Years of experience of vegetable production:** This was estimated by counting the number of years the farmers have been involved in vegetable production.

**Table 1.** Socioeconomic characteristics of the vegetable farmers in Mubi region.

Variable	Frequency	Percentage (%)	df	Chi	Prob>Chi
<b>Sex</b>					
Male	250	92	1	88.0	0.001
Female	20	7			
<b>Status</b>					
Single	40	51	2	239.60	0.01
Married	200	49			
widowed	30				
<b>Number of wives</b>					
1	30	11	5	112.16	0.01
2	100	37			
3	94	35			
4	25	9			
5>	21	8			
<b>Educational level</b>					
Quaranic	60	22	2	80.84	0.01
Primary	180	67			
No schooling	30	11			
<b>Type of farming</b>					
Crop farming	200	74	2	35.54	0.01
Lives stock	20	7			
Crop and livestock	50	19			
<b>Farm acres</b>					
0.5 acre-3 acre	100	37	2	35.27	0.05
4-5 acres	120	44			
6-12 acres 13 >	50	19			
<b>Source of farmland</b>					
Inheritance					
Rented	60	22	3	218.88	0.01
Lease	190	70			
Purchased	13	5			
	7	26			

Source: Field survey 2005-2007.

**Source of farmlands:** Farmers were asked to provide information on how they acquired their farmlands

## RESULTS AND DISCUSSION

Data collected for both years of survey were summarized, pooled and subjected to descriptive statistics as mean, percentages, and inferential statistics as Chi-square. This was used to discriminate among the options provided by the respondents. Evaluation of awareness of vegetable production technology was based on a four point Likert scaling test (4=very important, 3=important, 2=slightly important, 1= not important). The mean score for each technology information was determined. Technology information with a mean score of equal and above the cut-off mean of 2.5 was declared as information source perceived as important, and any mean score

lower than 2.5 was classified as information that is not important.

The demographic characteristics of the farmers interviewed is presented in Table 1. Majority of the vegetable farmers interviewed are of the male sex, married and are largely polygamous. This is an indication that dry season vegetable farming in this region is gender sensitive to the male sex. On the contrary Agboola, (2004) had noted that rural women in southern Nigerian provided up to 70% of labour required for dry season vegetable farming. In the same vein Gochkwoski and Ngoomba (1999) and Lumpkin and Wienberger (2003) reported the preponderance of women farmers in vegetable production in southern Cameroun and Tanzania. The polygamous family which predominate other forms could guarantee a reliable source of labour. Respondents interviewed are fairly educated, implying that vegetable technology information

**Table 2.** Irrigation technologies common among dry season vegetable farmers in Mubi region.

Variable	Frequency	Percentage (%)	df	Chi	Prob>Chi
<b>Water source</b>					
Rivers	200	74	3	218.88	0.01
Reservoir	10	4			
Boreholes	30	11			
Dugged well	30	11			
<b>Irrigation technologies</b>					
Motorized pump	200	74			0.01
Watering Carn	30	11	4	242.60	
Shadoff	10	4			
Tube well	10	4			
Wash borehole	30	11			
<b>Source of irrigation pumps</b>					
Market	240	89	2	165.68	0.01
ADP	20	7			
Fadama scheme	10	4			
<b>Irrigation methods</b>					
Surface irrigation	240	89	3	63.89	0.01
Sub surface	20	7			
Sprinkler	8	3			
Drop	2	1			
<b>Irrigation timing</b>					
Morning	245	92	2	364.00	0.01
Evening	20	7			
Both morning and evening	5	1			
<b>Quantification of water applied through intuition</b>					
Yes	260	96	1	51.86	0.01
No	10	4			

Source: Field survey 2005-2007.

communicated in clear and simple language will improve their production. Characteristically most of the farmers are resource poor; they cultivate less than five acres. This trend may be associated with the lack of capital. Expectedly, farmers in the study area use primitive tools and this is in line with conclusions of Mofeke et al., (2002) in a similar study among farmers in south western Nigeria. Because most of the farmers operate on a small scale, the use of Ox-drawn plough was common as compared with mechanized farming. Vegetable farmers interviewed have had substantial experience in vegetable production, and in most cases the land used for vegetable production are rented.

### Irrigation Technology

Vegetable farmers interviewed indicated that rivers and streams are the reliable source of water during the peak period of the dry season (Table 2). Therefore preference

is high for lands on the banks of rivers that cut across major cities. Most farmers use motorized pump, they are very effective in the distribution of water, but the cost of procurement, maintenance and servicing limits the individual ownership of the pumps, hence they hire and to a lesser extent they go into joint ownership. The preference for surface irrigation may be associated with low educational status, high cost and technical know-how associated with other technology. Respondents interviewed indicated that they irrigated their farms in the morning was common than in the evenings or both morning and evening. Majority of the farmers do not quantify the amount of water to be applied to their farms, but use their own intuition to determine when the water supply was adequate.

### Agricultural extension practices

The study area constitutes the zone 1 of the Adamawa

**Table 3.** Extension activities among the dry season vegetable farmers in Mubi region.

Variable	Frequency	Percentage (%)	df	Chi	Prob>Chi
<b>Awareness of extension agent</b>					
Yes	250	93	1	174.02	0.01
No	20	7			
<b>Frequency of visit by the Extension Agent</b>					
Always	30	11	2	8.20	0.01
Occasionally	50	19			
Never	190	70			
<b>Usefulness of extension agents</b>					
Very useful	190	90	2	40.64	0.01
Useful	30	11			
Fairly useful	25	9			
Not useful	20	7			
<b>Source of extension information</b>					
Extension agent	4	1	5	26.6	0.05
Sales men	50	18			
Neighbor	170	62			
Friends	25	9			
Newspaper	0	0			
Radio and Television	25	9			
<b>Seed source</b>					
ADP	20	7	3	98.23	0.01
Seed dealer	200	79			
Friends	30	11			
From previous cropping	20	2			
<b>Types of fertilizer used by respondents</b>					
Organic	40	15			
Inorganic	230	85	1	38.44	0.01

Source: Field survey 2005-2007.

state Agricultural Development Project. Hence logistics and manpower have been provided by the government. The dry season vegetable farmers acknowledged the presence of the Village Extension Agent. They complained that the frequency of visit by the VEA was inadequate (Table 3). However, vegetable farmers source for vegetable technology information from their fellow farmers or vegetable seed agent in their communities. The study indicated that awareness was high for vegetable production technology information as weeding, seed source, disease management, pest control, harvesting, market information and fertilizer use. Conversely, the use of improved land preparation technologies, water management, storage methods recorded less awareness among farmers (Table 4).

The effectiveness rating of vegetable technology information (Table 5) showed that the use of mechanized land preparation techniques was less effective among the farmers interviewed. This is sequel to complex technology and inadequate capital to acquire this technology. Ogunfeditimi (1987) had noted that complex and expensive technologies recorded low adoption; same could be

**Table 4.** Dry season vegetable farmers' awareness of dry season vegetable production information technology (n = 270).

Variable	Aware	Not aware
Seed dressing	250	20
Improved seeds	250	20
Land preparation	67	203
Weeding	137	133
Water management	160	110
Soil management	104	166
Disease management	134	136
Pest control	161	92
Harvesting	225	45
Storage	215	55
Processing	185	85
Market information	114	156
<b>Fertilizer use</b>	233	37

Source: Field survey 2006-2007.

could be said for effectiveness of such technologies.

**Table 5.** Effectiveness rating of dry season vegetable production technologies (n = 220).

Technology	Very effective	Effective	ineffective	Very ineffective	Mean score (XS)
Mechanized land preparation	10(0.2)	10(0.15)	60(0.55)	170(0.70)	1.60
Seed dressing	233(3.45)	32(0.35)	3(0.02)	2(0.007)	3.83
Improved seeds	243(3.6)	20(0.22)	4(0.03)	3(0.01)	3.86
Planting methods	215(3.18)	32(0.35)	20(0.15)	3(0.01)	3.69
Weeding	250(3.70)	20(0.22)	0.00	0.00	3.92
Water management	208(3.08)	36(0.40)	20(0.15)	6(0.02)	3.65
Disease management	250(3.70)	20(0.22)	0.00	0.00	3.92
Pest control	250(3.70)	20(0.22)	0.00	0.00	3.92
Harvesting	251(3.70)	19(0.21)	0.00	0.00	3.91
Storage	28(0.41)	0.00	22(0.16)	220(0.81)	1.38
Processing	0.00	20(0.22)	30(0.22)	220(0.81)	1.25
Market information	0.00	20(0.22)	50(0.37)	200(0.74)	1.33
Fertilizer use	263(3.89)	7(0.07)	0.00	0.00	3.96

Source: Field survey 2005-2007.

Vegetable technology information as seed dressing, availability of improved seeds, planting methods, weeding, water and disease management, pest control, harvesting and use of fertilizer recorded mean score above 2.50. They were found to be very effective among the farmers. This could have positively influence vegetable production in the study areas. The educational status of the respondents might have contributed to their poor awareness and effectiveness rating for most of these technologies.

The study indicated that vegetable production is high among farmers in zone 1 of Adamawa state Agricultural Development Project. Constraints and challenges to dry season vegetable production have been emphasized. Awareness and effectiveness of vegetable production technology is high among the farmers. Low awareness and effectiveness noticed for some technology could be improve through participatory training between the extension unit and the farmers. The need to enhance the performance of the extension unit for proper delivery was emphasized.

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