



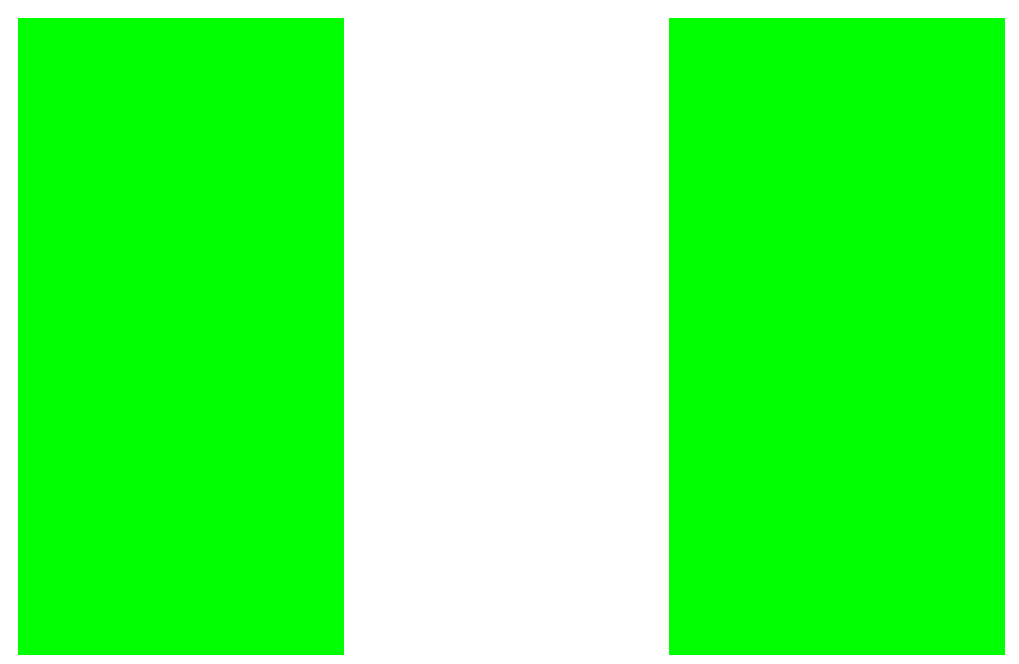
# Principal Component Analysis of Cocoyam Production in Western Nigeria

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## INTRODUCTION

In spite of the many potentials and advantages of cocoyam production, the crop is treated as a minor crop in Nigeria and the average output levels is declining (Ogunniyi, 2008). One of the reasons for this may not be unconnected to dismay and little attention farmers give to cocoyam when compared to cassava and yam that are close substitute root tuber crops (Okoye *et al*, 2008).

In view of the above, this study examined the socio-economic characteristics of the cocoyam farmers in the study area and determined the gross margin of its production in the study area. Finally, the study determined the key determinant of cocoyam production in the study area.

## RESEARCH METHODOLOGY

### Study Area

The study was carried out in Ondo State. The State is one of the six States in Western Nigeria. The State is made up of 18 Local Government Areas with a total population of about 3.4 million inhabitants (National Population Commission (NPC), 2007).

### Data Collection

A multi-stage sampling technique was used to select respondents for the study. Ondo State the highest producers of cocoyam in Western Nigeria (NBS, 2012) justified the reason for selecting the State as the study area. In the second stage data on cocoyam production was collected from six Local Government Areas (LGAs) that are the highest producers of cocoyam in Ondo State. In each LGA, 50 cocoyam farmers were selected and data were collected with structured questionnaire.

### Data Analysis

Descriptive statistics was used to summarize the socio-economic characteristics of cocoyam farmers. The farm budgeting analysis was used to analyze the data collected. In determining the major components of cocoyam production in the study area, the eigenvalue-one criterion was used to solve the problem of number-of-components. The projection of the cocoyam production in the study area  $i$  along the axis defined by the principal component is:

$$a'_{ij} = \sum_{t=1}^n a_{it}v_{tj}$$

Where  $V_{tj}$  is the  $t^{\text{th}}$  coefficient for the  $j^{\text{th}}$  principal component;  $a_{it}$  is the expression measurement for the cocoyam production in the study area.  $a^j$  is the data in terms of principal component.

## SUMMARY OF FINDINGS

Table 1: Socio-economic Characteristics of the Respondents

Socio-economic Characteristics	Frequency	Percentage
<b>Sex</b>		
Male	234	78
Female	66	22
<b>Total</b>	<b>300</b>	<b>100</b>
<b>Age in years</b>		
21-30	4	1.33
31-40	18	6
41-50	36	12
51-60	62	20.67
61-70	136	45.33
Above 70	44	14.67
<b>Total</b>	<b>300</b>	<b>100</b>
<b>Farming Experience in years</b>		
1-10	72	24
11-20	177	59
21-30	30	10
Above 30	21	7
<b>Total</b>	<b>300</b>	<b>100</b>
<b>Marital Status</b>		
Single	Nil	Nil
Married	282	94
Divorced	Nil	Nil
Widowed	18	6
<b>Total</b>	<b>300</b>	<b>100</b>
<b>Education Attained</b>		
No formal Education	115	38
Some primary School	87	29
Completed Primary School	69	23
Some Secondary School	08	03
Completed Secondary School	Nil	Nil
Tertiary		
<b>Total</b>	<b>300</b>	<b>100</b>
<b>Major Occupation</b>		
Farming	92	31
Apprentice	117	39
Trading	91	30
<b>Total</b>	<b>300</b>	<b>100</b>
<b>Types of Labour</b>		
Family	294	98
Hired	6	2
<b>Total</b>	<b>300</b>	<b>100</b>
<b>Mean Age</b>		<b>61.89</b>
<b>Mean Farming Experience</b>		<b>21.04</b>

Source: Field Survey, 2013



Table 2: Cost of Cocoyam Production Per Hectare

Items	Cost (₦)	Percentage of Total Cost
Land preparation (manual)	20,000	20.5
Planting materials	10,500	10.8
Sett preparation	12,000	12.4
Planting	10,000	10.2
Weeding (3 times before harvesting)	30,000	30.8
Mulching	5,000	5.1
Harvesting	10,000	10.2
<b>Total</b>	<b>97,500</b>	<b>100</b>

Source: Computed from field Survey, 2013

Table 3: Net returns per hectare of cocoyam production

Item	Naira
Revenue	198,000
Cost	97,500
Net returns	100,500
Net returns per naira cost outlay	1.03
Cost of production per basket	886.36

Source: Computed from field Survey, 2013

† N160 is equivalent to US\$1.00.

Table 4: Result of PCA on the data collected from 210 people in Ondo state, Nigeria

Variables	X <sub>1</sub>	X <sub>2</sub>	X <sub>3</sub>	X <sub>4</sub>	X <sub>5</sub>	X <sub>6</sub>	X <sub>7</sub>	X <sub>8</sub>
<b>Eigenvalue</b>	3.8876	3.6001	1.0371	0.6105	0.2902	0.2365	0.0318	0.0219
<b>Variance</b>	34.37%	32.34%	17.65%	7.23%	4.21%	3.63%	0.34%	0.23%
<b>Cumulative</b>	34.37%	66.71%	84.36%	91.59%	95.8%	99.43%	99.77%	100%

Source: Computed from field Survey, 2013

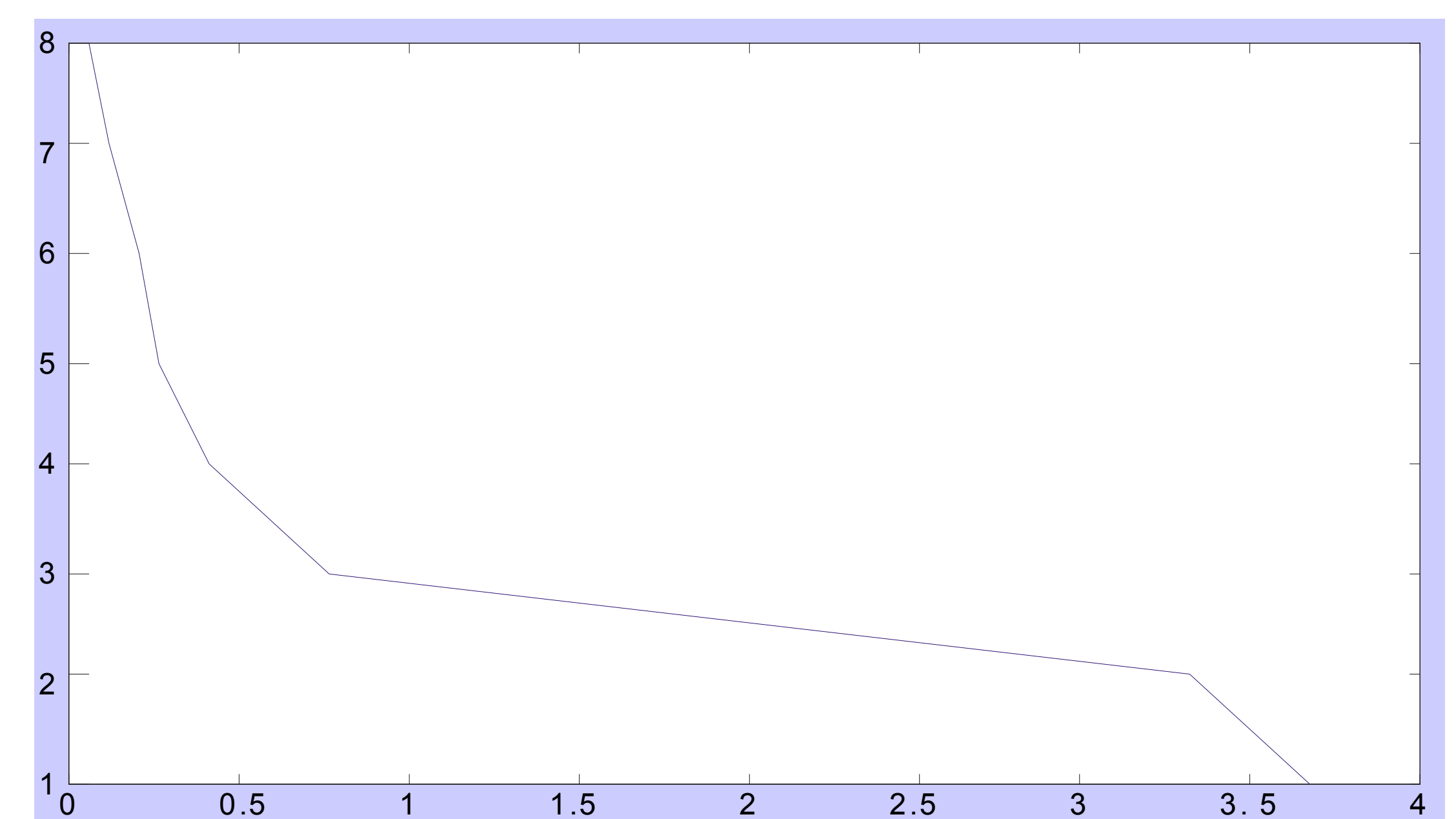


Figure 1: Plots of Eigenvalues of the principal components.

## CONCLUSION AND RECOMMENDATIONS

The study showed that majority of the respondents were male, married and were above 50 years old. Also, a net return of N100,500.00 is made per hectare of cocoyam and the net return per one naira investment made was N1.03.00. This indicates that cocoyam production is a profitable venture. The result of the principal component analysis showed that socio-economic characteristics of the farmers and perception are the major determinants of cocoyam production. Base on these findings, the study recommended that young farmers should be sensitized about the profitability of cocoyam production so as to encourage them in producing the crop.

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