

**EFFECTS OF DEVELOPMENT PARTNERSHIP IN HIGHER EDUCATION
PROJECT ON WELFARE STATUS OF RURAL WOMEN PROCESSORS IN OYO
AND OSUN STATES, NIGERIA**

BY

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**A THESIS IN THE DEPARTMENT OF AGRITURACULL EXTENSION AND
RURAL DEVELOPMENT**

**SUBMITTED TO THE FACULTY OF AGRICULTURE AND FORESTRY IN
PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE OF
DOCTOR OF PHILOSOPHY OF THE
UNIVERSITY OF IBADAN.**

SEPTEMBER, 2016

ABSTRACT

Women are responsible for the bulk of agricultural processing activities in rural areas. Dearth of effective processing facilities has limited their productivity, thus predisposing them to low welfare status. Development Partnership in Higher Education (DELPHE) intervention sought to enhance women processors' capacity, however, its effect on their welfare status is yet to be ascertained. Therefore, the effects of DELPHE project on welfare status of rural women processors in Oyo and Osun states were investigated.

A three-stage sampling procedure was used to select respondents for the study. Four and two Local Government Areas (LGAs) from Osun and Oyo states, respectively where DELPHE project was executed were purposively selected. Two participating and two non-participating communities were randomly selected from each of the LGAs. Ninety six (Oyo) and 120 (Osun) beneficiaries were proportionately selected from the participating communities. Using same structure for non-beneficiaries, registered processors from non-participating communities were selected to give 32 (Oyo) and 56 (Osun) respondents. Structured interview schedule was used to collect data on respondents' personal and enterprise characteristics, knowledge of processing activities, participation in DELPHE project activities, benefits derived, attitude of participants, constraints to processing activities and welfare status. Indices of participation (0-18; 0-8 low, 9-18 high), benefits derived (Low 0-6, high 7-14), attitude towards the project (Unfavourable 49-62, favourable 63-84) and welfare status (Worse $\text{N}750-\text{N}5,836$, better $\text{N}5,837-\text{N}16,500$) were generated. Data were analysed using descriptive statistics, Pearson Product Moment Correlation, t-test, ANOVA and multiple regression at $\alpha_{0.05}$.

Respondents' age and household size were 43.9 ± 12.0 years and 6.0 ± 2.0 person, respectively. Majority (87.0%) were married, while 52.7% of beneficiaries and 55.7% of non-beneficiaries had primary education. More beneficiaries (63.4%) had high level of participation in project

activities, 65.7% highly benefitted from the project, while 56.7% had favourable attitude towards the project. Weighted mean of most important benefits derived were skill acquisition (0.84), enterprise expansion (0.78) and increase in yield (0.76). Most severe constraint to beneficiaries on their processing activities was lack of credit facilities (0.60), while high cost of processing equipment (1.54) was identified by non-beneficiaries. Welfare status of beneficiaries (₦7,629.53±1,710.60) was higher than that of non-beneficiaries (₦1,437.60±721.59). Welfare status of Osun state beneficiaries (₦8,719±0.33) was significantly higher than Oyo (₦1,281±0.33). More beneficiaries (67.3%) in the better welfare status derived higher benefits, while 41.9% in the worse welfare status had low benefit. Determinants of welfare status for Osun beneficiaries were years of processing ($\beta=0.189$) and income ($\beta=0.123$), while for non-beneficiaries were occupation ($\beta=-0.847$) and household size ($\beta=0.251$). Determinants of welfare status among beneficiaries in Oyo were years of processing experience ($\beta=0.373$) and income ($\beta=-0.267$), while for non-beneficiaries were household size ($\beta=0.123$) and occupation ($\beta=0.847$).

The Development Partnership in Higher Education improved welfare status of beneficiaries from Oyo and Osun states. Income and years of processing experience were major determinants of beneficiaries' welfare status in both states.

Keywords: DELPHE project, Beneficiaries' welfare status, rural women processors, rural communities

Word count: 469

DEDICATION

This study is dedicated to Almighty Allah, Who destined and facilitated it; and to my late mother, Alhaja Risqat Ajoke Shelle, may Allah's mercy abide by her and grant her Aljanah Fridaus..

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ACKNOWLEDGEMENTS

All praise and adoration be to Allah, the most gracious, the merciful, the cherisher, and the sustainer, of the entire universe. I acknowledge the inestimable favour of my Lord, Allah, Who brought me up to this extent.

I sincerely express my profound gratitude and deep appreciation to my supervisor Professor Janice Olawoye for her inestimable support morally, academically, physically, and constructive criticism in ensuring that this thesis becomes a successful one. I wholeheartedly appreciate your effort ma. May God bless and strengthen you ma.

To members of the supervisory committee; Professor Stella Odebode and Dr Kemisola Adenegan, the postgraduate committee, Prof L.A. Akinbile, Dr B.R. Olajide and O.T. Yekinni, for their careful scrutiny and guidance that ensured successful completion of this work. Your contributions and advice throughout this work are very much appreciated. May God prosper you all in your endeavours.

My profound gratitude goes to my head of Department, Professor A.E. Adekoya and all my teachers, who have taken interest in the work since the pre-data seminar phase. The critical and constructive comments are well appreciated. I also appreciate the assistance rendered by Professor J.A. Farinde (Deputy Coordinator of DELPHE project) and Dr (Mrs) E.O.. Farinde for providing small grant for this thesis writing. May God bless you and your entire household. I specially thank Prof. J.A.I. Omueti, for his immeasurable support all through, may you live long to enjoy the fruit of your labour.

I sincerely appreciate the contributions and concerns of all the academic staff in the Department of Agricultural Extension and Rural Development, Professors A.A. Ladele, M.K. Yahaya, Nkiru Meludu, Stella Odebode, L.A. Akinbile, J.O. Oladeji, B.O. Oyesola, M.G. Olujide and Drs. Pippy Fawole, Sarafat Tijani, B.R. Olajide, O.T Yekinni, K.A. Thomas, O.I. Badiru and Mrs Olufolake Adelokun. I further acknowledge the contributions of the

administrative staff members, Mesdames Bose Ojo, Oyeyemi Joseph, Tope Oyawale, Tope Olaosebikan, Abiodun Adesina, Bunmi Morakinyo, Seyi Ikujuni and Mr Daniel Oghiange.

I sincerely appreciate

the contributions of Prof M.A.Y. Rahji, Prof. T.T Awoyemi, Prof. S.A Yusuf, Prof. V.O Okoruwa, Dr K.K. Salman, Dr B.O Adisa, Dr B. Bamigboye, Dr Grace Akanbi, Bayo, Mrs F. Oladejo, and Omonike Adesina. Similarly, I appreciate the contributions received through interactions with my fellow students, particularly Wale Adejumo, Okanlawo Oluwatoyin, Temitope Abdusalam, Seun Adeleke, Judamat Abu, Samson Oyegbile, Nathaniel Oluwategbe, Mudashir Hajarat, Favour Eferouku, and Odunuga Azeez. Thank you all and God bless.

My parent, Alhaji Tairu Akanni- Shelle and Late Alhaja Risqat Akanni-Shelle deserve all the gratitude a child may ever show to her parents. I am indeed grateful for all your efforts right from my birth up to this moment. Mother, unfortunately you are unable to witness the successful completion of this research work for the reasons best known to Almighty Allah, despite all your moral and financial support. I pray Allah grant you Al-jannah fridaus. I say a big thank you to the Akanni-Shelles and my cousins: Soji, Wale, Segun, Monsurat, Jide , Kemi, Biyi , Tunbi , Bimbo, Ramat, Bola, Lanre, Muti, Taoreed, Salmat, Qudus, and also to my aunties, Alhaja Kudirat Gafar, Alhaja Ganiat Sanni, Alhaja Sarat Giwa, Alhaja Olaogun, Alhaja Subulade Etti, and Messrs Folashade Akinjohnson, Oluwatoyin Amosu and Monsurat Orekan, The same greetings extends to my uncles, Barrister Nasir Lawal, Alhaji Moroti Shelle, Mr Wasiu lawal, Mr Bolaji and Mr Kola Adigun and my cousins. I also want to extend my gratitude to my father and mother in-law, Alhaji and Alhaja Oyewole, may Allah grants you long life and sound health. My profound gratitude goes to my well- wishers and friends for their support, among them are Mrs Ramat

Oyewole, Adenike Hamzat, Bose Onitiri, Yemisi Ogunimo, Bimbo Ibraheem, Biodun Adedoyin, Mama Fasoyin, Dr R. Asafa and all Aunty Ayo' Girls Comprehensive Secondary School Students 92 set.

I wish to appreciate my beloved husband, Yusuf Olayinka Abiodun Oyewole, for his, encouragement, endurance and for providing enabling circumstances throughout the period of this programme. I also appreciate my wonderful children, Nimotalai Omodolapo, Nasrah Oluwadamilola and Toheebah Omoteniola, Oyewole for their cooperation, understanding and endurance throughout the period of this programme. I pray Allah make you greater in all facets of goodness than I will ever be able to achieve.

Oyewole, Mojisola Fauziyah. (2016)

CERTIFICATION

I certify that this was carried out by **Mojisola Fauziyah Oyewole**, a PhD candidate in the Department of Agricultural Extension and Rural Development, University of Ibadan, Ibadan, Nigeria.

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LIST OF ACRONYMS AND ABBREVIATIONS

ADP –	Agricultural Development Projects
ANOVA –	Analysis of Variance
BLP -	Better Life Programme
CMP -	Cassava Multipliers Programme
DELPHE-	Development Partnership In Higher Education
DFID –	Department for International Development
FAO-	Food and Agriculture Organisation
FSP –	Family Support Programme
FEAP –	Family Economic Advancement Programme
IFAD -	International Fund for Agricultural Development
IITA -	International Institute of Tropical Agricultural
LGA -	Local Government Areas
NAERLS-	National Agricultural Extension Research and Liaison Services
NAFPP-	National Accelerated Food Production Programme
NFDP –	National Fadama Development Project
NFSP –	The National Food Security Programme
NGO -	Non-Governmental Organisation
MDG –	Millennium Development Goal
OAU –	Obafemi Awolowo University
OFN -	Operation Feed the Nation
PPMC –	Pearson Product Moment Correlation
PSM -	Propensity Score Matching
SES-	Socio-Economic Status
WIA -	Women In Agriculture

UNESCO - United Nations Education Scientific and Cultural Organisation

UN - United Nations

UNDP - United Nations Development Programme

UNIFEM - United Nations Development Fund for Women

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CHAPTER ONE

INTRODUCTION

1.1 Background to the study

Human development is a multi-dimensional process involving changes in structure, attitudes and institutions as well as the acceleration of economic growth, which results in the reduction of inequality and poverty (Okiy, 2012). According to Agbamu (2006), development is a gradual change that helps to improve the competence of people. It entails improvements in the socio-economic and technological systems that operate in a given community. It consists of resource generation process, efficient utilisation of resources, and resource conservation. It is an increase in outputs in all sectors of economy and the distribution of outputs in such a way to enhance the quality of life of the general population (Goshit, 2002).

Development programmes can be in different fields such as education, health or agriculture (UNESCO, 2010). For instance, in education, the Universal Basic Education (UBE) which was introduced in 1999 by the Federal Government of Nigeria as a reform programme aimed at providing greater access to, and ensuring quality of basic education throughout Nigeria. In the health sector, the Canadian International Development Agency (CIDA) programme in Nigeria, in harmonization with other development partners, has increased the efforts to align their programme with the plans and priorities of the Federal Government particularly in the National Health Sector Developmental Plan (NHSDP). In the agricultural sector, the Growth Enhancement Support Scheme (GES) embarked upon by the Ministry of Agriculture and Rural Development provides subsidised farm inputs directly to farmers. In addition, the Ministry developed the Electronic Wallet system which allows both male and female farmers to receive subsidized electronic voucher for their seeds and fertilizers on their mobile phones. All these developmental projects are interrelated as they focus on the marginalized persons, including the rural women.

Many development agencies are increasing their emphasis on assisting rural women to secure income through their own efforts. Such approaches are often categorised as income generating activities and initiatives, co-operative undertakings, job creation scheme, credits - saving groups and capacity building for sustainable development. Development programmes specific to the needs of women have also been implemented in Nigeria. These programmes include the Women in Agriculture (WIA) programme of the Agricultural Development Projects (ADP) and the Better Life for Rural Women (BLFW) programme. Zaid and Popoola (2010) asserted that the concern for increasing the standard of living of rural women in Nigeria can be seen in the general concern to alleviate poverty in the rural households. Many programmes have been designed by the government in the past to improve the standard of living of the rural women in Nigeria. In recognition of the past government's efforts, some development intervention programmes stepped up efforts to improve the welfare status among rural women in Nigeria. One of such programme is the Development Partnership in Higher Education (DELPHE) development intervention programme

1.2 The DELPHE Project in Nigeria

The DELPHE entrepreneurial development project was funded by Department for International Development (DFID), United Kingdom between August, 2009 and September 2012. It was designed to exploit the inherent entrepreneurial capability of African women by motivating them to be aware of the immense possibilities open to them to start-off thriving rural enterprises in the areas of natural resource utilization, and on and off-farm wealth generation activities through certain objectives. The DELPHE project trained 420 rural women in Osun and Oyo states on selected enterprises which include:

- Cassava processing with value addition to improve nutritive quality and market acceptability,

- Oil palm processing and marketing,
- *Moringa* production and utilization,
- Soybean processing and value addition products,
- Bio-gas production and utilization,
- Organic fertilizer production and utilization,
- Sheep and goat rearing and marketing, and
- Capital generation and management.

The project was an intervention that sought to identify and develop the women's innate characteristics for entrepreneurial development for improved welfare status. It was a collaborative intervention project between Obafemi Awolowo University, Ile-Ife, Nigeria, Institute of Agricultural Research and Training (IAR&T), Moor plantation, Ibadan Nigeria and the University of Newcastle Upon Tyne, United Kingdom (DELPHE, 2008). The project started in September 2009 and ended August 2012. The project's thematic area in business and enterprise development had the main objective as enhancing increased rural household income and improved rural standard of living in the study areas.

The specific objectives included:

- To develop appropriate social survey methodologies for discovering rural people and community potentials in rural enterprises;
- To identify rural women and community potentials in various rural enterprises;
- To build capacity of 25 academic staff, 50 technical/field staff and 20 graduate students in the design and management of rural enterprises;
- To establish 15 strategic development centres where about 75 rural entrepreneurs are trained yearly;
- To transform rural women entrepreneurs to facilitators (75) who will be training other rural entrepreneurs (5 people per entrepreneurs = 375 entrepreneurs per year) and

train 20 Young Women Enterprise Fellows (YWEFs) in practical business management;

- To bridge town and gown knowledge gap to improve rural economy through university resources utilization at local level; and
- To develop new curriculum in business and enterprises studies as certificate course for potential entrepreneurs.

1.3 Statement of the research problem

According to World Bank (2008), about 1.4 billion of people live on less than \$1 per day. In Nigeria, 54.1% of the population lived in multidimensional poverty while 17.8% were vulnerable to multiple deprivations. Nigeria's Human Development Index in 2012 was 0.471; which is below the average (0.504) for countries in sub-Saharan Africa (UNDP, 2013).

Rural poverty studies revealed that the number of women living in absolute poverty in developing countries, including Nigeria increased from 400 million in 1995 to 600 million in 2010 (IFAD, 2011). Many programmes such as Better life for Rural Women, Family Advancement Programme sponsored by either the Federal Government or international agencies have been designed to improve the standard of living of the rural women in Nigeria. However, most of these programmes have failed to ameliorate the living conditions of rural women, because women in rural areas for which such programmes were meant, lagged behind in terms of socio economic advancement.

The missing link however has been due to absence of an effective training system for mobilizing and stimulating them into action with a view to improve their welfare status. Minniti and Arenius (2003) asserted that despite the growth of women in professional and managerial jobs, the gender gap in entrepreneurship remains significant. In order to ameliorate the situation, there is need for concerted efforts from the government and

development partners in form of interventions. One of such interventions is the DELPHE development project.

Since the conclusion of the project in 2012, there has been no organised study to evaluate its effectiveness in achieving its main objective which is enhancing increased rural household income and improving rural standard of living in the study areas. The effect of any programme on welfare status of beneficiaries depend a lot on their participation in the project activities, their knowledge, attitude towards the project, the constraint faced and the benefit they derived from the project. One of the ways to ascertain the contribution of the project towards welfare of the women is to confirm if beneficiaries achieved better welfare status than non beneficiaries. It therefore became imperative to assess the extent to which DELPHE project has improved the welfare status of rural women processors' in Oyo and Osun states, Nigeria.

Therefore, the following research questions were addressed in this study

1. What are the enterprise characteristics of beneficiaries and non beneficiaries in the study area?
2. What are the respondents' levels of knowledge on their various processing activities in the study area?
3. What is the level of participation of beneficiaries in DELPHE development activities in the study area?
4. What are the attitudes of the beneficiaries towards the DELPHE project in the study area?
5. What are the benefits derived by beneficiaries in the DELPHE projects in the study area?
6. What are the constraints faced by the beneficiaries and non beneficiaries in their processing activities in the study area?

7. What is the welfare status of the beneficiaries and non beneficiaries across the four processing groups of the DELPHE project in the study area?

1.4 Objectives of the study

The main objective of the study is to evaluate the effect of DELPHE project intervention on welfare status of rural women processors' in Oyo and Osun states of Nigeria.

The specific objectives are to:

1. examine the enterprise characteristics of beneficiaries and non beneficiaries in the study area;
2. assess the respondents' levels of knowledge on various processing activities in the study area;
3. ascertain the beneficiaries' level of participation in the DELPHE project activities in the study area;
4. determine the attitude of beneficiaries towards the DELPHE project
5. find out the benefits derived from participating in the DELPHE and other intervention projects in the study area;
6. identify the constraints faced by the beneficiaries and non beneficiaries in their processing activities in the study area; and
7. compare the welfare status of project beneficiaries and non beneficiaries across the four types of processing groups in the study area .

1.5 Hypotheses of the study

The hypotheses of the study, which are stated in null form, are as follows:

- H₀1: There is no significant relationship between the rural women processors' socio economic characteristics and their welfare status

- H₀2: There is no significant relationship between beneficiaries' attitude towards the project and their welfare status
- H₀3: There is no significant relationship between benefits derived by respondents and their welfare status.
- H₀4: There is no significant relationship between the constraints faced by the respondents in their processing activities and their welfare status.
- H₀5: There is no significant difference in the welfare status across the rural women processing groups in the study area.
- H₀6: There is no significant difference in the welfare status of the beneficiaries and non beneficiaries of DELPHE project in the study area.
- H₀7: There is no significant difference in the welfare status of Osun state beneficiaries and Oyo state beneficiaries in the study area.

1.6 Justification for the study

This study is imperative because of the call for improving the welfare status of rural women. Consequent upon the benefits derivable from developmental programmes, the need then arises for community members to organize themselves into groups. This would not only assist them to jointly participate in identifying and executing their development needs, but would also serve as an opportunity to determine the effects of the development programmes on the community members.

This study will no doubt unfold the extent to which the goal of poverty reduction of the DELPHE project has been achieved. Information on rural women socio economic characteristics such as income, education, which contributes to their welfare status, will guide the executing bodies to adjust the projects in such a way that there is overall improvement in the welfare status of the rural women. It will also serve as source of information to

community developers, so as to know steps to take in reducing the existing high degree of discontentment and dissatisfaction among community members with their living conditions and their perceived neglect by the government at all levels.

Results of the study will add to the available information for the use of researchers, Non-Governmental Organisations, executors, organisations and government agencies involved in the area of agriculture and rural development. This study will also be of significance to the Ministry of Women Affairs in the nation, as they would use it to improve on their services to women in rural and urban areas. It will also help in formulation of policy by government at all levels.

1.7 Scope of the study

This study investigated the effect of DELPHE project on the rural women processors' beneficiaries' and the non-beneficiaries' welfare status in Oyo and Osun states. The study did not cover similar projects in the study area.

1.8 Limitation of the study

The Development Partnership in Higher Education project covered only two states in Nigeria. If more states were involved, special consideration would have been given to the zone in sampling.

1.9 Definition of terms

The main concepts of this study are the following

1. **Effect:** This refers to the degree to which executed project in the community satisfy its goal, that is, meet the beneficiaries' desires and needs: for example how the beneficiaries' members' welfare status has been transformed.
2. **Participation:** Any activity or actions which enable individuals of different economic and social status have an input into decision making process and to play a role in improving the quality of lives in the community.

3. **Development:** A multidimensional process involving changes in structures, attitudes and institutions as well as the acceleration of economic growth, reduction of inequality and eradication of poverty.
4. **Project:** A planned undertaking requiring concerted efforts towards the improvement of living conditions of the people in the community.
5. **Rural Women:** Women living in community of low population with characteristics of lack of basic infrastructure such as water, electricity, health care and transportation.
6. **Welfare Status:** State in which the living condition of the people in such matters as social security, health, education, housing and working improve.
7. **Intervention:** is an act or set of activities aimed at improving the existing condition of a set of persons concerned
8. **Activity:** An act or acts target towards a particular goal.
9. **Processors:** Person involved in converting fresh agricultural produce into a finished product
10. **Poverty:** It is a state of being poor, lacking of certain amount of material possession or money.
11. **Beneficiary:** recipient and participants of an intervention programmes (DELPHE)
12. **Non Beneficiary:** non-recipient or non-participants in of an intervention programmes (DELPHE)
13. **Community:** This is a geographical location or social entity, urban neighbourhood, villages or groups with common interest such as women's group, market women's association.
14. **Group:** A number of people having the same characteristics that comes together to achieve similar objective.

15. **Enterprise:** is a particular business venture such as poultry enterprise, processing enterprise.

16. **Partnership:** People having joint interest or investment in a project.

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CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 The concept of community development

Yunusa, (2008) regards community development as a process concerned with the improvement as well as the transformation of the social, mental, economic, institutional and environmental conditions of the rural dweller. This is achieved through the mobilisation and rational utilization of their human material and institutional of their human material and institutional resources as to enhance their capabilities to cope with the daily tasks and demands of modern times. Development is about the quality of life of people, their capacity to improve the conditions of their existence, to reach, control and utilize their resources for greater productivity.

Nwangboso and Duke (2012), reported that community development involves a lot of multi-sectoral activities such as the improvement in agriculture, the promotion of rural industrial activities as well as the establishment of appropriate decentralized structures in order to allow for mass participation in the development process. Rural development also requires citizens' participation, increase in their productive capacity and attitudinal change leading to their desire and ability to manipulate their environment so as to shun their sense of dependence on their environment. Ogunowo and Oderinde (2012), posited that objective of rural development should not only be increased agricultural production but also provision of socio- economic infrastructure that that will make life worthy of living in those areas. It is the view of these that rural development should be able to provide employment opportunities so that the underemployed labour resources of the area can be productively utilized.

2.1.1 The importance of community development

Rural development is aimed at improving and expanding physical infrastructural facilities towards enhancing the quality of life and standard of living of the people, hence it is

people and infrastructural oriented with inter-governmental linkage. The importance of community development is summarised as follows:

1. It improves the income generating capacity and living standard of the rural masses by satisfying their basic security, food, shelter, clothing and employment needs.
2. It involves the rural masses generally in governance especially in initiations and executions of integrated rural development programmes on a continuing and self-sustaining basis.
3. It increases employment opportunities in rural communities and make them more productive and less vulnerable to national hazards, poverty and exploitation.
4. It ensures more equitable distribution of income and narrows the gap between the urban rich and the rural poor, by upgrading the skills and earnings capacities of rural dwellers.
5. It stems the tide of rural urban migration and its attendant problems.
6. It improve data collection and statistics on rural situation and on demographic variable relevant to the planning, executive, monitoring, and evaluation of integrated rural development programmes on a continuing and self sustaining basis.

2.1.2 The need for development project in Nigeria

There is no doubt that many people in Nigeria cannot meet the basic needs of life showing a high level of poverty in the country. Okunmadewa (2001) observed that despite Nigeria's physical and human resources, there had been progressively worsening welfare and poverty of less than three hundred and twenty naira pre capital per month, which will barely provide for a quarter of nutritional requirements for healthy living. The low educational attainments and rural character of people are minored in geographical distribution of poverty. Considering the pronounced poverty in the country and especially with the women in the rural areas in Nigeria,

DFID sponsored a development project titled (DELPHE) intervention for the country. According to (DFID, 2006), the aim intends to emphasise economic growth, self-help, capacity building, equity and empowerment. Development assistance to alleviate poverty and improve the economic situation has always been in an uncoordinated initiative with little or no impact at the grassroots level. Tokula and Apu (2007), observed that opportunities for sustainable agriculture could be created through the use of locally available locally available resources. This is intensified using the micro environment in farm systems, diversification by using new technologies, social participatory process leading to group act, human capital building through continuous learning programmes, access to affordable finance (credit and subsidies), and adding value through processing and increase returns and adding value through direct or organised marketing to consumers.

It is evident that sustainable agricultural systems can be economically, socially, environmentally viable and contribute positively to local livelihood. Nevertheless, any policy to that effect should be formulated with the rural women in mind as contributors to national development. An important thing to do in development project is empowering the community to feel involved and be together in any development project planning and execution. Madavo (2000) identified beneficiaries' participation as an integral part of effective poverty reduction strategies that can improve their standard of living. Standard of living is generally used to describe the quantity of goods and services actually consumed by individual and his family. This includes the ownership and use of such items as radio, television, refrigerator, cooker, eating of balanced regular meals, being well clothed, living in a descent house, owning some means of transportation and payment of bills. (Ekong, 2003).

When all modern household facilities, goods, and services are considered, it is obvious that people in the rural areas enjoy lower level of standard of living than their counterpart in the urban areas. In terms of level of economic development, quality of life,

access to opportunities, facilities and amenities and standard of living, the gap between the urban and rural areas in Nigeria is very wide (Ogidefa, 2010). Inability of the rural people to easily provide those abilities is not farfetched from the fact that poverty is hitting hard on rural dwellers. (John, 2010). Development assistance to alleviate poverty and improve the standard of living of people is necessary and should be evaluated to determine its effect on the people.

2.1.3 Capacity building for sustainable development

According to Agunyai (2015), capacity building often refers to strengthening the skills, competencies and abilities of people in societies, so that they can improve on their weak innate potentials to attain better level of standard of living. Capacity building, also referred to as capacity development, is a conceptual approach to development that focuses on understanding and removing the obstacles that inhibit people, governments, and other entities from realising their developmental goals, while enhancing the abilities that will allow them to achieve measurable and sustainable results. Capacity building is included in the programmes of most development organisations because of its importance in the attainment of their goals. Such organization include: Food and Agriculture Organisation (FAO), United Nations Development Program (UNDP) and Department for International Development (DFID).

The components of capacity building include the following:

- Human resource development - the process of equipping individuals with the understanding, skills and access to information, knowledge and training that enables them to perform effectively;
- Organisational development – the elaboration of management structures, processes and procedures, not only within organizations but also the management of relationships between the different organizations and sectors at public, private and community levels and

- Institutional and legal framework development, making legal and regulatory changes to enable organizations, institutions and agencies at all levels to enhance their capacities (UNDP, 2006).

2.1.4 Rural women in development

According to Ekong (2003), development process in pre-industrial societies generally involved the participation of women in various spheres of activities including weeding of farms, growing of 'women crops', processing of crops, clearing of compounds, child care, socialization, animal rearing, weaving, pottery-making, harvesting and marketing of minor products such as pepper, vegetable and so on. However, the possibility and degree of their participation in these activities depended partly on ecological circumstances and partly on the cultural definition of sex roles in their societies.

One of the major attributes of such societies was the division of roles along the lines of sex. The social, economic and political opportunities enjoyed by women were limited in various degrees of cultural norms and values. In many societies women were denied certain rights ranging from that of land inheritance to that of participating in some important matters affecting their societies. All over the world, women's participation in development programmes is influenced by the prevailing norms, culture, religious beliefs and gender-related issues which cut across industrialised cities to the grassroots (Salawu, 2011).

In modern times, the trend is changing, as women now play increasing and divergent roles in different societies and more so in advanced industrial societies. Today, women play significant roles side by side with men in almost all spheres of activities. Such activities include politics, trade and commerce, the military, teaching, medical practice, tailoring, modern agriculture and public services. Ekong (2003) reported that divergent views have been expressed about women generally, and rural women in relation to development. The contributions made by rural women in national development, especially in developing

societies such as Nigeria, are made at individual and group levels and are paramount in the areas of agriculture.

When women control additional income, they spend more of it than men do on food, health, clothing and education for their children. This has positive implications for immediate well-being as well as long-run human capital formation and economic growth through improved health, nutrition and education outcomes. There is need for development projects in Nigeria. Rural women are active agents of the economy promotion of social change and environmental protectors in many ways. They play crucial roles in ensuring food and nutrition security, eradicating poverty and improving the well being of their families. They are constrained in their roles as farmers, producers, processors, investors and caregivers as a result of gender discrimination that deny them equitable access to opportunities, resources, assets and services.

The procedure of capacity building of women should be increased particularly in the developing countries through access to capital, resources, credit, land, information on technical assistance and training. Rural women access to education and training can have a major impact on their potential to access benefits from income generating opportunities and improve their overall wellbeing (United Nations, 2012). In order to achieve these, rural women should be involved in development.

Rural women's involvement in development has been the focus of intensive debates at most international forums in the past years. Among those forums that recognised the plight of the Third World women's involvement in development process are the 1995 Nairobi Forward Looking Strategies for advancement of women, the 1995 Beijing Declaration and the United Nations Development Fund for Women. These forums expressed that each member state was expected to promote women's economic independence, including the creation of

employment, access to resources and credit, the eradication of the persistent and increasing burdens of poverty, malnutrition, poor health and illiteracy (Kongolo, 2009).

Although such declarations increased an awareness and understanding of the problems facing rural women and their needs, it has not yet resulted in significant development priorities in terms of their expectations and aspirations. Women are very important in rural development practices. Given their position at the domestic and resource management levels, rural women constitute potential and critical agents for rural transformation. The rural women command a diversity of experiences in their daily management of resources. Despite these contributions, their voices are hardly heard, while their efforts and contributions are never mainstreamed in national and local development policies and practices in Nigeria.

Several challenges militate against their integration and mainstreaming at any level of development. These include unfavourable cultural tradition, inadequate policy and institutional structures for capacity building; absence of rural infrastructures, limited awareness and access to social network and opportunities. The importance of woman in development has been underscored through provisions of some international resolutions and agenda and their subsequent domestication at national government levels, including Nigeria. The United Nations General Assembly's resolution on Women's Rights and International Peace sets aside March 8 of every year as International Women's Day.

The Beijing Declaration and Action Platform was adopted by the Fourth World Conference on Women in 1995. The platform and action re-affirm the fundamental principle that the rights of women and girls are an inalienable, integral and indivisible part of universal human rights. The platform strongly opposes inequality and all forms of violence against women. Consequently, all national governments were required to develop strategies or national plans of action to implement the platform locally. In June 2000, the

United Nations General Assembly adopted a political declaration reaffirming member States' commitment to the objectives set forth in the Beijing declaration and platform for action.

The Beijing platform actually influenced some elements in the United Nations Development Goals which specifically addressed gender related issues such as achieving universal education (Goal No. 2); promoting gender equality (Goal No. 3), and improving maternal health (Goal No. 5). International declarations and resolutions focusing on gender right and women empowerment have always guided the Nigerian government actions on gender and women related issues over the years. Policy commitments and some programmes specifically directed at women especially in the rural areas include:

1. Some policy commitments to achieving women participation in political activities.

Women campaign groups on this issue have flourished helping to pressurize governments to concede some political positions for women. Although statistics related to gender mainstreaming in national politics and bureaucracies are hardly available, there have been progressive policy pronouncements, sometimes with political promises of 30% positions for women in national governments. Progress at streamlining women participation at States and local levels have been rather slow, and complicated by the absence of useful statistics.

2. Universal Basic Education. National interest in guaranteeing universal basic education has been spurred by the Millennium Development Goals. Ensuring the implementation of universal basic education has been a tool strategically directed at enforcing girl child education at the grass root level. Offshoots of some programmes have been developed specifically to reach out to girls. For instance, the Girl Education Project (GEP) of the federal government of Nigeria was designed to improve and increase girl enrollment and retention in schools, with target supports from the Governments Conditional Cash Transfer

(GCCT) for the girl child. Various State governments have pursued similar or related projects and programmes over the years beginning from 1999 when Nigeria transitioned to a democratic government.

3. Subsidy Reinvestment Program (SURE-P) was launched in 2012 as a social safety net, aimed to alleviate the impact of the oil subsidy removal on vulnerable populations. The programme was to engage 10,000 women and youths in public works across each State in Nigeria. The SURE-P, not only sought to mitigate the immediate impact of partial petroleum subsidy removal on the population, it was equally to serve as a tool for empowering the rural women by involving them in some occupational activities aimed to better their lives and improve on their livelihood activities.

4. There have also been some targeted financial services to rural women across Nigeria through Micro-Finance Banks (MFB) and the Central Bank of Nigeria (CBN). These financial services are run under the umbrella of Nigeria's Vision 20: 2020 specifically aimed to redress rural gender inequalities and subordination through some forms of financial empowerment programmes.

These programmes have been very useful in principle. In practice, there is a paucity or complete absence of relevant statistics to assess their utility and relevance in enhancing the empowerment of rural women. It is also important to note that the existence of these programmes hardly receive solid institutional back up in the forms of legislations, etc. They exist, more or less, as ad hoc and regime-based programmes whose utility and existence are tied to politics and the longevity of a specific regime. Hence the rural women still face critical challenges in relation to participation in development activities. To strengthen the contribution of the rural women in development activities, the following critical areas for policy and implementations are recommended:

a. There is urgent need to focus on developing strong institutional supports for gender mainstreaming. Nigeria has not made significant progress in domesticating relevant international agenda through local legislations. This challenge also applies to virtually all aspects of gender and women development issues including property inheritance, violence and other forms of abuse against women, universal education and gender equality. Many of the programmes and actions at the moment exist as administrative pronouncements, which rarely outlive changes in regime. The critical policy priority at the moment remains the need to achieve foundational empowerment of the present generation through quality education for the girl child and economic empowerment for the women in general. There is an urgent need to streamline girl education within the legislative framework to make it a compulsory enrollment with appropriate penalties for defaulting parents/guardians.

b. Nigeria's rural areas lack critical infrastructures of roads, functional schools, hospitals, functional markets and credit systems. Agriculture still forms the mainstay of the rural women, which are organized under subsistent basis. Absence of basic infrastructures for the rural women undermines whatever efforts put forward to build their capacity. Complicating the absence of critical infrastructures are traditional barriers including absence of the proprietary and inheritance rights, gender biases in access to opportunities, etc. Policy priorities should be focused on developing the rural areas, while critical infrastructures that connect the rural women to urban markets and opportunities should be in place. These are certainly going to lead to some considerable empowerment and capacity building for the rural women as well as position them to contribute effectively to the development of the rural areas.

c. Cultural and Religious Barriers: Nigeria's rural women still suffer enormous cultural barriers including inferiority status, discrimination in relation to opportunities, priority for

the male child over the female, and restricted position as 'home makers' and domestic managers, as well as 'women in purdah' phenomenon common among Muslim women.

These barriers impoverish women, disempower them and subject them to all forms of abuses. Eliminating these barriers require bold policies, legal, legislative and administrative actions and reforms. These should form an urgent agenda for policy consideration.

2.1.5 The role of rural women in Agriculture and community development

According to Musa (2011), who stated that rural women are the largest group whose participation should receive special consideration in the design and implementation of agricultural development projects. In most agricultural development projects, women participate unequally in decision making, implementation of new technologies, benefits and evaluation. Raidimi (2015) pointed out that the economic contribution of women is known to be substantial. They play an important role in storage, processing and marketing of food and cash crops. Community development cannot succeed if it does not involve rural women and take advantage of their potentials.

According to the United Nations (2012) in Africa, a larger number of the populations are dependent on agriculture. Thus women contribute consistently and considerably to the family sustainability. Women's fundamental contributions on their households' food production and national economic are increasingly acknowledged within Africa. This is due to part of African women's own energetic efforts to organize and articulate their concerns and make their voices heard. At both the grassroots and national levels, more women associations have been formed since the 1990s taking advantage of the new political opening to assert their leadership roles. They are also pressing for an expansion of women's economic and social opportunities and the advancement of their own rights. Many rural women belong to all women mutual-aid societies, benevolent groups in churches, mosques and co-operatives

ventures. These co-operatives societies have provided women access to resources. Women have contributed their quota to give room for development. Their activities were in agriculture, poultry making, and health care service.

Current literature provides ample evidence for the assertion that women in Africa play a major role in small scale agricultural production of crops for home consumption and for sale. According to the report of the United Nation Development Fund for Women (UNIFEM, 2003) the contribution of women to agricultural production and household food security is substantial. In some countries women perform laborious and repetitive tasks around the year, whereas men's works are limited to ploughing and threshing periods. In several cases irrigation, pest control and fertilizer application are the exclusive tasks of men, while threshing and marketing are the exclusive tasks of women.

They work in all aspects of cultivation including planting thinning, applying fertilizer and harvesting. They are actively involved in post harvest activities and livestock production, particularly small animal and dairy production. Damisa and Yohanna (2007) have both described the various contributions of women to agricultural production in Nigeria as cited in Ogunlela and Mukhtar (2009). As much as 73% of women sub Saharan African countries are involved in cash, arable and vegetable gardening, while post-harvest activities had 16% and agro forestry, 15%. Abdullahi (2000) and Afolabi (2008) reported that in some states of Nigeria rural women have virtually taken over the production and processing of arable crops, being responsible for as much as 80% of the staple food items. Small ruminant production is an important source of meat, milk, organic manure and income but with no attention to the rural women's development.

2.2 The impact of women participation in community development

The impact of development on rural women differs from that of women in urban areas. Substantial evidence suggests that rural women have been consistently neglected in the

process (World Conference on Women, 2011). There is also overwhelming evidence that development policies and projects were formulated without the involvement of rural women in most African countries (Hunger Project 2000). The majority of population in developing countries lives in rural areas, where they play the role of food producers. Development is a process by which people are awakened to opportunities within their reach. Development, therefore, starts with people and progresses through them (Zosuls et.al.2011). About 55% of women live in Africa communal areas where they constitute almost 60% of the farmers and provide approximately 70% of the labour essential for food security (Ohman *et.al.*2015). This is the reason why rural women should be involved in development initiatives, because they are the most marginalized group of people. The patriarchal nature of Nigeria's societal structures imply that women continuously remain subordinated to men, which tend to narrow their spaces of opportunities and limit their participation in development activities.

2.3 Beneficiaries' participation in development projects

It is through participation that beneficiaries of any development programme have input into the priority setting, planning implementation, consumption and evaluation of development programme. Hence, participation is any activity, or action which enables individual to have an input into the decision making process and to play a role in improving the standard of living of people. Peoples' participation is deeply inherent in the very concept of community development which enjoins that whatever is done to improve the welfare of people must endeavour to elicit the enthusiasm in the whole- hearted participation of such people.

The idea of participation as it applies to community development strongly implies that success is ensured where efforts of local community is supplemented by the direction of government policy. The idea of people's participation implies that people are involved in the planning, execution, utilization and assessment of the social amenities designing to improve

their welfare. Participation enables development to be built on the strength, tradition, beliefs and values of the community. If any development projects should contradict the beliefs and values of a community, it could end up being abandoned (Ikpe, 2000). So for any development programme to meet the objective for which it is organized, active participation of people is necessary.

With active participation of people in any development programme, they will have pride of ownership of the facility resulting from the programme. Another important outcome of participation is that it increases knowledge and builds confidence in the people. By taking part in decision-making, planning and implementation of a development programme, people become more effective in rational decision-making and knowledge of their situation and how best to solve their problems with available resources.

2.4 Challenges and opportunities facing women participants in development programme

The root of the marginalized position of rural women is the fact that they are least educated. Another impediment to progress in agricultural development is the high rate of illiteracy among women farmers. Although these days, African primary schools have as many female pupils as male, the rate of illiteracy among women is still above 90% in 28 African countries. According to Ugboh (2006) illiteracy diminishes self confidence, aggravates inferiority complex and stifles the actualization of one's potential for development. Women participation in decision making is gradually becoming an issue of importance in African agriculture. In a study of socio-economic status of women farmers, Gurung, (2009) made an interesting finding. He reported that when major decisions involved money, those decision domains were men's, but when money was not involved, such as farm activities and food sharing, decisions were made entirely by women or jointly with men.

The implication is that the male members of the family solely do the financial activities, while the women have a greater input in household decision making, Gender inequality and discrimination against women farmers in sub-Saharan Africa is common. It is common knowledge that gender inequality is one of the most pervasive forms of inequality particularly, because it cuts across other forms of inequality Franklin, (2007). Lack of access to land remains a major constraint for women farmers in Africa and land reform programmes have led almost exclusively to the transfer of land rights to male heads of households. Sreekumar (2001) added that even in countries where ownership and inheritance laws have been reformed in favour of women, in practice women do not necessarily have more rights to land, as local customs and lack of information act as barriers.

In the same vein, as land holdings, women have less access to credit than men. Women receive as low as 5% of agricultural loans in Burkinfaso to as high as 32% in Zimbabwe. Several studies on women's status and problems have shown that gender discrimination exists throughout the world (Ogunlela and Mukhtar, 2009) but that its intensity is felt more in the daily lives of women and children in developing countries. Many factors have militated against women's participation in community development programmes. They include the following:

(a) Access to land

The first of these constraints is access to land across Africa, agricultural intensification; population growth and economic change have led to substantive shifts from common property systems of tenure towards more centralized resources control.

In the process, women and poorer people have lost out. Women rarely own land and when they do; their holding tends to be smaller. (Kumar and Agnes, 2015).

(b) Labour bottleneck

Excruciating manual labour is also bottleneck for female farmers as men have left rural economic in search of more viable livelihoods. The only means for most women to increase their yield is through harder work.

(c) Credits and other inputs

In addition to land, labour, women face problems of access to other inputs including credit, technology, extension services, agricultural training and marketing. Many credits associations and export-crop marketing co-operatives limit membership to household heads in many countries, thereby excluding most women. Bank demands collateral in the form of landed property and male approval before making loans to women, while men have been reluctant to support women's application. Most resources and technical assistance have been channelled to men, growing export crops, with improved seeds and tools going to larger commercial farmers.

(d) Women's employment

Analysis of women employment in Africa is constrained by unreliable data, as well as by problem in defining what constitutes economic activity for women, particularly in the agricultural and informal sectors. Women face greater vulnerability in the labour market because of the relative lack of education and training, the tendency to channel women into certain occupation, and the continuous heavy burdens of unpaid domestic work, child-bearing and child care, which restrict the time and energy available for income earning activities

(e) Educational training

Lack of access to formal education and training has been identified as a key barrier to women's employment and advancement in the society in many African countries. Parents still prefer to send boys to school, seeing little need for education for girls. In addition, factors such as adolescent pregnancy, early marriage and girls' greater burden of household labour act as obstacles to their schooling. Also few women are found in technical education where they could develop better skills to secure better paying jobs.

(f) Health and sanitation

Inadequate potable water, sanitation and waste disposal in rural areas leave populations vulnerable to water borne diseases. These conditions are compounded for women by some unhelpful or even dangerous religious practices and norms centred on their reproductive and productive functions.

2.5 Empowerment efforts for women in agriculture

A lot of women are known to be participating in the programmes of several governmental and Non-Governmental Organizations geared towards economic empowerment through farming and food security across the continent of Africa and even beyond (World Bank, 2003). In Nigeria, Government and non-governmental organizations interventions for instance in the cassava subsector have led to a number of measures that support the production, processing and marketing of cassava, dating back to the 1970s. However in recent times, some of the government programmes such as the National Accelerated Food Production Programme (NAFP), Operation Feed the Nation (OFN), Better Life Programme (BLP) and Family Support

Programme (FSP) have faded out for several reasons including lack of funding and policy reversal (Sabo, 2007).

Some of the vigorous agencies now in existence include the Agricultural Development Projects (ADPs), National Agricultural Research Systems, the International Institute of Tropical Agriculture (IITA) and other international agricultural research centres and large-scale planting material multiplication and distribution facilitated by the IFAD-assisted Cassava Multiplication Programme (CMP) and activities of oil companies and church organizations. At present the operations of the IITA is notable. Its first enormous success is the breakthrough it achieved in cassava production through the improved variety version of cassava stems known as TMS, which requires only about 15 months for maturity unlike the traditional type which takes about 24 months.

The improved variety was introduced in Nigeria from the mid-1970s. Since then, the Ibadan institute has continued to endow the staple with other desired features, making new genotypes available to national programmes throughout sub-Saharan Africa from which selections are made of varieties suitable for local growing environments. The second as well as recent achievement of the institute is the effort at facilitating training workshops on cultivation and processing methods, and providing cassava stems to plant, as well as processing equipment. Women farmers and their families are benefitting from higher crop yields and higher earnings from the sale of cassava products.

In recent years, export of cassava products constitutes a buoyant source of income to those involved. The network of partners involved, from the local to the international level, are helping women in Nigeria gain a brighter future. However, this cannot be said to be true for rural women, as they are not often reached by such organizations (von Braun, 2007).

2.6 Efforts of Non-Governmental Organizations to improve rural women activities in Nigeria

The attempt to boost agriculture in Nigeria has not been left in the hands of the government alone. Some vibrant organizations have extended their generous hands to exist. The following NGO is notable: The Better Life Programme for the African Rural Women. The Better Life Programme for the African Rural Women was initiated in September 1986 by Dr. (Mrs.) Maryam Babangida when, as the wife of the Head of State, she championed women issues vigorously. She sought to improve the quality of life and status of the rural women: by creating awareness in women and encourage them to realize, utilize and develop their potentials for a more fulfilling life.

The programmes of the organization are in the framework of rights-based approach within the MDG's. It has as its main focus improving the earning opportunities and alleviation of poverty and elimination of ignorance among rural women. While the primary target group of this programme remains the women, the recent phenomenal increase in the incidence of poverty in developing countries particularly the sub Saharan Africa, has necessitated the widening of the programme's scope to accommodate other vulnerable groups in the society. The United Nations Decade for Women (1975 – 85) served as a catalyst in focusing attention on issues confronting women world-wide.

In Nigeria, the decade meant very little to the teeming majority of women especially those in rural areas. It was clear that there need to address the situation of rural women. Increasingly and diverse dimensions, poverty was becoming feminized. The alleviation of poverty has generally been the cornerstone of economic policy of successive administration in Nigeria. Over the years government at all levels has conceived and implemented several socio economic policies and programmes to eliminate rural poverty and to create prosperity with varying degree of success. The Better Life Programme for the Rural Women was one of the

numerous strategic institutional approaches put in place to solve some of the identified challenges facing a considerable portion of our population.

The Better Life Programme for the African Rural Women was initiated in September 1986 by Dr. (Mrs.) Maryam Babangida when, as the wife of the Head of State, championed women issues vigorously. She sought to improve the quality of life and status of the rural women: by creating awareness in women and encourage them to realize, utilize and develop their potentials for a more fulfilling life. The programmes of the organization are in the framework of rights-based approach within MDG's. It has as its main focus improving the earning opportunities and alleviation of poverty and elimination of ignorance among rural women. While the primary target group of the BLFRW remains the women, the recent phenomenal increase in the incidence of poverty in developing countries particularly the sub Saharan Africa, has necessitated the widening of the programme's scope to accommodate other vulnerable groups in the society.

The basic tenets of the programme then were to enhance the economic, social, political and psychological well being of the rural women through a coordinated strategy and partnership with Government and Non Governmental agencies, organized private sector as well as gender sensitive individuals worldwide. The programme was envisioned to harness the creative energies and innate potentials of the rural womenfolk and unemployed youth in Nigeria for concrete and achievable goals both as individuals and as a group. The main goal was not only to empower these potential beneficiaries, but also to mainstream these formidable units of action in national development. The programme's design and development is located in the gender and development as well as the human rights approach. The two approaches are complimentary and are important for ensuring that women understand the context in which their rights are located as well as what their rights are and what they can do to access and claim these rights as citizens of their country. Having effectively established the programme in Nigeria, it was repositioned as

the Better Life Programme for the African (Rural) Women on April 2004, and registered with the Corporate Affairs Commission.

The 2004 Way Forward Workshop held in Minna, Niger State provided the high level consultation with members and other relevant stakeholders, which was required for consolidation. This is the foundation of the second phase of the work. The programme has a wide network and astute connection with policy makers and parliamentarians which is one requirement to facilitate advocacy and gender mainstreaming. There are functional offices on almost all the states of the federation and efficient outreach in most countries of the West African sub region, in Europe and America. With the legendary impressive track records over the years in quality service delivery at the grassroots in Nigeria it has always been an attractive platform for other local and international NGOs to operate and achieve their mandate. The fight against rural poverty, youth unemployment and other related socio-economic issues is multi-dimensional and hence required strategic partnership.

2.7 Women-In-Agriculture (WIA) efforts in women empowerment

Women-In-Agriculture in Nigeria is a branch of the Agricultural Development Projects (ADP). Report has shown that they have made important progress different States of the Federation in incorporating gender in agricultural extension, by modifying the ADP system midstream to provide for women farmers through the creation of programmes in the department of Extension Services of the affected States with a gender focus (Onyibe 2001; Odurukwe, et al, 2006). The WIA program sought to improve agricultural extension services for women. It involved the retraining of existing home economics agents in agriculture and extension methodologies, placing special emphasis on women's activities.

WIA program ensured that extension services in every state in Nigeria have female extension workers at every level of operation from state headquarters in the capital, down to the villages. The structure of the WIA program itself is also decentralized and integrated into the

extension service (Odurukwe et al, 2006). This programme was established not essentially for soil cultivation but mainly to mobilize women in gender specific activities, which includes post-harvest activities like processing, utilization, storage and marketing of agricultural products. According to Odurukwe, et al (2006), the major activities of WIA still remain to form women group and assist them establish group-farms.

It is through these groups that WIA extension agent transfers recommended technology to the women for adoption. However the WIA programme places much emphasis on off-farm activities of the women and has concentrated in the transfer of the following home economic technology as:

- Cassava processing and utilization- pancake, flour and odorless fufu
- Processing and storage of maize garri, cassava flour, tapioca, maize flour, malted maize drink, corn meal, pap (wet and malted maize flour).
- Processing and utilization of soybean into soymilk, flour paste and soy meal
- Processing and storage of fresh tomatoes into tomato paste.
- Rabbit meat processing and utilization
- Processing and storage of melon
- Cocoyam processing and utilization into cocoyam flour for soup thickening and cocoyam chips
- Dry season vegetable gardening
- Harvesting and storage of paddy rice.

According to the study carried out by Odurukwe, et al (2006), on the impacts of the women-in-agriculture (WIA) extension programme on women's lives in Imo State, positive result has been recorded from the adoption of this programme by women, as these women are now able

to improve in such areas as family food security and increased financial contribution to household needs. Impact in children's education has also recorded positive response. It however shows that the impact was more on rural women than their urban counterpart. In the same vein the study conducted by Sabo (2007) on the impact of WIA in Borno showed a positive result. In recognition of the past government efforts, some development intervention programmes stepped up efforts to improve the welfare status among rural women in Nigeria. Example is the Development Partnership in Higher Education (DELPHE) development intervention programme.

2.8 The DELPHE Project in Nigeria

The Development Partnership in Higher Education (DELPHE) entrepreneurial development project was funded by Department for International Development (DFID), United Kingdom between August, 2009 and September 2012. It was designed to exploit the inherent entrepreneurial capability of African women by motivating them to be aware of the immense possibilities open to them to start-off thriving rural enterprises in the areas of natural resource utilization, and on and off-farm wealth generation activities through certain objectives. The Department for International Development (DFID), United Kingdom sponsored training programmes for rural women under the Development Partnership in Higher Education (DELPHE) project on rural entrepreneurship development. The DELPHE project trained 400 rural women in Osun and Oyo states on selected enterprises which include:

- Cassava processing with value addition to improve nutritive quality and market acceptability,
- Oil palm processing and marketing,
- *Moringa* production and utilization,
- Soybean processing and value addition products,

- Bio-gas production and utilization,
- Organic fertilizer production and utilization,
- Sheep and goat rearing and marketing, and
- Capital generation and management.

The project was an intervention that sought to identify and develop the women's innate characteristics for entrepreneurial development for improved welfare status. The project was a collaborative intervention project between Obafemi Awolowo University, Ile-Ife, Nigeria, Institute of Agricultural Research and Training (IAR&T), Moor plantation, Ibadan Nigeria and the University of Newcastle Upon Tyne, United Kingdom (DELPHE, 2008). The project, started in September 2009 and ended August 2012. The project thematic area in business and enterprise development had the main objective as enhancing increased rural household income and improve rural standard of living in the study areas particularly with the rural women processors.

2.9 Rural women and processing Activities in Nigeria

The Agro-foods industry plays a fundamental role in the creation of income and employment opportunities in developing countries. The agro-processing sector is by far the most significant component in the agro-food industry and covers a broad area of postharvest activities, packaged agricultural raw materials, industrial and technology intensive processing of intermediate goods and the fabrication of final products derived from agriculture (Olaoye, 2014). Rural women farmers not only play a vital role in food production; they also carry out agricultural activities beyond crop production. Women take active part in farming, processing and marketing.

The role women play in agriculture and the rural society is fundamental to agricultural and rural development in Nigeria and sub Saharan Africa. Women in Africa are

said to make up more than one-third of its entire workforce (Ezeihe *et.al*, 2014), most especially in processing activities.

2.9.1 Oil palm processing

Palm oil comes from the fruit of the oil palm, *Elaeis guineensis*, which is most commonly found in one of the following three varieties: *Dura*, *Pisifera*, and *Tenera*, a hybrid cross of *Dura* and *Pisifera* that is the most commonly planted today (Vanisheni *et.al.*,2002) The trees reach a height of about 60 feet and produce fruit bunches that weigh between 10 and 25 kg and contain several hundred fruitlets. The round fruitlets are orange-red and ripen to dark purple (*Malaysian Palm Oil Council*, 2008). On average, two or three bunches are harvested from each tree. The trees produce fruit for thirty years, although it is more difficult to harvest the trees as they grow.

The fruit is composed of an outer skin called the exocarp; the fleshy mesocarp from which the palm fruit oil is squeezed; an inner nut called the endocarp; and a kernel inside the nut from which palm kernel oil is squeezed (Kwaski, 2002). Crude palm fruit oil is bright orange-red in color and is semi-solid at room temperature. Each palm fruitlet is composed of about 61% crude oil by weight, and a fruit bunch contains about 17-20% oil by weight. The oil palm produces about 2.7-2.8 tonnes of fresh fruit bunches per 0.16 hectares annually (Kwaski, 2002).

2.9.2 Production of palm oil

The production of crude palm oil includes a series of phases beginning with harvesting the fruit and ending with storing the oil, each using different methods and machines. Oil palm fruit can be processed in batch, continuous, or semi-continuous systems. A batch system extracts oil from consecutive batches of fruit, while in a continuous system, each step in the oil extraction process feeds into the next. In a semi-continuous system, there may be pauses if some steps take longer than others do. The crude palm oil production

process requires a large set of equipment, which can range from crude, manual mechanisms to advanced, automated machinery. Regardless of the types of machines used to produce crude palm oil, there are still a set of basic steps needed to produce palm oil.

The first step in palm oil production is harvesting the palm fruit bunches. A harvester cuts the fresh fruit bunches from trees and allows them to fall to the ground. The fruit may be allowed to ferment, or fully ripen, in order to loosen the base of the fruitless from the bunches and to make their removal easier. The fruitless are removed from the bunch during the threshing process. Threshing can either be done by hand or with a mechanical thresher, which rotates or vibrates to separate the fruit from the bunch. The sterilization process uses heat to partially cook the fruit. This process also stops enzymatic reactions that lead to oxidation and disrupts the cells in the mesocarp, allowing for easier oil extraction (Kwaski, 2002).

Wet processes use water to sterilize the fruit by either steaming or boiling the fruit, producing wastewater as a by-product, while dry processes sterilize the fruit by smoking or roasting it. When implementing a wet process, the fruit is sterilized *before* the threshing process. In a dry process, the fruit is sterilized using dry heat *after* the threshing process. The digestion process crushes the fruit before extraction and warms the pulp to maximize oil yield. Facilities that use the wet process remove the nut from the pulp before pressing to yield grade A oil. The pulp is then pressed, which bursts the oil-containing cells, releasing the palm oil. There are several types of presses that may be used to press the fruit pulp, including manual presses, hydraulic presses, and screw presses. The screw press is the most commonly used press because it yields the most oil when pressing the mesocarp (Baryeh, 2001). Next, the oil is heated and filtered to remove impurities.

Palm oil production is a relatively clean procedure with minimal CO₂ emissions – the only greenhouse gases emitted are from the burning of fuel for heating during the sterilization, digestion, and filtering procedures (Rosenthal, 2007). However, at the end of the

palm oil extraction process, there is a substantial amount of waste material from the processing procedure, including empty fruit bunches, palm kernel shells, palm press fiber, and wastewater. Although a great deal of waste is produced, much of this waste can be used for other applications. The empty fruit bunches can be compressed into blocks used for fertilizer, mushroom cultivation, or animal feed. Using the empty fruit bunches and shells as a fuel source often results in higher smoke emissions due to incomplete combustion.

The smoke emitted often exceeds the maximum of 400 mg/m³ set by National Quality Standards. Facilities can burn the empty bunches to heat the sterilization process, or they can incinerate the empty bunches and use the ash, which contains a great deal of potassium, to fertilize the palm trees (Kwaski, 2002). Palm press fiber can also be used as fertilizer for plants. The fiber is combustible, making it useful as a secondary, although inferior, fuel source. Its ash contains phosphorous, potassium, and calcium, making it a good source of fertilizer. The wastewater produced from palm oil processing contains high levels of nitrogen, phosphorous, potassium, and magnesium, all of which are essential nutrients to the growth of oil palm trees.

Thus, it is also ideal as a fertilizer for oil palm trees (Chavalparit, 2003). After the kernels are used in the production of palm kernel oil, the empty shells can be processed to manufacture active carbon, which is useful for water filtration. They can also be used in the production of concrete and bricks (Chavalparit, 2003). In the wet process, the overall water intake can be reduced through the reusing of wastewater and the collection and reuse of water condensate. Many processing facilities practice a form of co-generation, where electricity is generated to run their own machinery using waste press fiber as fuel. Simply collecting and reusing boiler water can save 30 m³ of water for every tonne (1000 kg) of fruit bunches processed (Chavalparit, 2003).

2.9.3 Moringa processing activities

Moringa oleifera is a multipurpose and exceptionally nutritious vegetable tree with a variety of potential uses. It is a sub-tropical species that is known by different regional names as benzolive, drumstick tree, kelor, marango, mulangay, nébéday, saijhan, mooringai and sajna. It has very high nutritional properties that would be useful as a food supplement, especially in those relegated communities. Besides its nutritional and medicinal applications, *M. oleifera* is very useful as an alley crop in the agro-forestry industry. It is useful not only for human beings but also for animals and also in various industrial applications.

Besides *Moringa oleifera* being processed into a medicine, it contains acetone which can be prepared into herbal formulation which is an effective anti-malaria bio agent (Patel et.al, 2010). Such trees have the potential to be a source of new drugs (Singh et al 2012). It is also an effective water clarifier using the seed, thus providing millions of people with clean drinking water (Francis, 2009). The leaves, fruit, flowers and immature pods of this tree are used as a highly nutritive vegetable in many countries, particularly in India, Pakistan, Philippines, Hawaii and many parts of Africa. It is originated initially in the Northern part of India some 5000 years back and soon moved into the Southern parts as well, where it was known as ‘Murungaikeerai’ (Moringa leaves) and ‘Murungaiakai’ (Moringa vegetable). In the northern part of Nigeria it was referred to as Zogale, in eastern part it is known as odudu oyinbo while in the western part it is called Igi Ile.

The Moringa tree had spread to most part of Asia, nearly the whole of Africa, South America, southern part of North America and some pockets in Europe. Moringa has been used as a traditional medicine around the world, for anemia, skin infections, blackheads, anxiety, bronchitis, catarrh, chest congestion, asthma, blood impurities, cholera, glandular, swelling, headaches, conjunctivitis, cough, diarrhea, eye and ear infections, fever, abnormal blood pressure, hysteria, pain in joints, pimples, psoriasis, respiratory disorders, scurvy,

semen deficiency, sore throat, sprain, tuberculosis, for intestinal worms, lactation ,diabetes and pregnancy. The healing properties of Moringa oil have been documented by ancient cultures.

Moringa oil has tremendous cosmetic value and is used in body and hair care as a moisturizer and skin conditioner. Moringa oil has been used in skin preparations and ointments since Egyptian times (Monica, 2005). The leaves possess remarkable nutritional and medicinal qualities (Singh *et.al*, 2012).They contain high amount of vitamin C, which fights a host of illnesses including colds and flu; vitamin A, which acts as a shield against eye disease, skin disease, heart ailments, diarrhea, and many other diseases; Calcium, which builds strong bones and teeth and helps prevent osteoporosis; Potassium, which is essential for the functioning of the brain and nerves, and Proteins, the basic building blocks of all our body cells.

Another important point is that Moringa leaves contain all of the essential amino acids in a good proportion, which are the building blocks of proteins. These leaves could be a great boon to people who do not get protein from meat. Moringa even contains arginine and histidine. two amino acids especially important for infants, who are unable to make enough protein for their growth requirements. The micro-nutrient content is even more in dried leaves; (ten times the vitamin A of carrots), (17 times the calcium of milk), (15 times the potassium of bananas), (25 times the iron of spinach) and (nine times the protein of yogurt (Manzoor *et.al*, 2007).

Therefore it is necessary to increase the utilization of Moringa leaves consumption by the different communities. It should be consumed either fresh or dry. Dried leaves can be stored for a long time and can be used regularly. Many companies across the world manufacturing various products of Moringa leaves such as Moringa Tea, Moringa Tablets, Moringa Capsules, Moringa leaf Powder, Moringa Soaps and Moringa Face

wash. Some beverages are also available in market prepared by Moringa leaves. So it is necessary to hygienically drying and processing of Moringa leaves for further uses. In this paper we have described processing of fresh Moringa leaves into dry form for consumption purpose.

2.9.3.1 Leaf harvesting

Young and old leaves both are suited to making dried leaf powder. Morphology of leaf can be identified as they are 20-70 cm long, greyish-downy when young, long petiole with 8-10 pairs of pinnae each bearing two pairs of opposite, elliptic or obviate leaflets and one at the apex, all 1-2 cm long; with glands at the bases of the petioles and pinnate . Moringa leaves can easily lose moisture after harvesting, therefore, harvest early in the morning and complete the initial phase of processing in the same day, if possible. Selection of healthy leaves Fungi like *Cercosporasp* and *Septorialycopersic* causing brown spot in the leaves and further turning the leaves yellow and killing them. Apart from fungi the most common pests on the leaves are grasshoppers, crickets and caterpillars (Moringanews, 2010). Therefore diseased and damaged leaves are discarded manually just after the collection of fresh leaves.

Washing Collected leaves are washed in running tap water till the removal of dirt. After this leaves are soaked in 1% saline solution (NaCl) for 5 minutes to remove microbes. Leaves are further washed with 70 % ethanol followed by twice washing with distilled water. This step plays a substantial role in removal of dust, pathogens as well as microbes present on the leave surface.

2.9.3.2 Draining, drying and grinding

The excess water can be removed by spreading the leaves in sunlight for a brief period till the removal of water present on the leaf surface. It is estimated that only 20-40% of vitamin A will be retained if leaves are dried under direct sunlight, but that 50-70% will be

retained if leaves are dried in the shade. High temperature may lead down to the breakage of protein present in the leaves (Martin, 2002). Therefore shade dry is recommended for the drying process. Spread the leaflets on the sterile clean green net in a well-ventilated room. Mosquito net may be used for this purpose because these materials give a space between the floor and the leaves. This room should be insect, rodent and dust proof. Air circulation can be improved by using ceiling and floor level vents protected with a clean filter to keep the sun and dust out.

If it is possible to use a fan, but the air must not be directly oriented towards the leaves, as it can increase contamination with germs in the air. It is advisable to turn the leaves over at least once, with sterile gloves, to improve uniform drying. Leaves should be completely dry within a maximum of 4 days. The loading density should not exceed 1 kg/m²; all persons involved in this step must ensure that, while on duty, personal cleanliness and hygiene are maintained. Personal protective equipment (PPE) such as head caps, nose masks, disposable gloves, etc. must be used at all times.

Moringa leaf powder immediately absorbs moisture and the product can reabsorb humidity during or after grinding. For this reason, Moringa leaf powder should be dried at 50⁰c for 30 minutes to reduce moisture content. If stored powder is exposed to heat or light it will degrade and the nutrient content will be reduced. Moringa Leaf Powder can be stored for up to 6 months under the following conditions: clean, dried powder stored in air-tight containers, protected from light and humidity, and kept below 24°C (75.2 °F). In small scale dried leafs can be grinded by mortar and pestles or pulmunizer machine can be used for fine grinding. Commonly 0.5 mm – 1.0 mm pore size screen is used for the separation of the fine grinded leaf powder.

2.9.4 Soybean processing activities

Soybean (*Glycine max* L.) is one of the major leguminous crops cultivated all over the world today with Nigeria as the largest producer in both Western and Central Africa, since its introduction in the early twentieth century. Soybean is widely known to be cheap, easily available and a good source of protein compared with expensive animal protein when purchased as Soybeans to be only about 10-20% of the cost of protein from meat, eggs, fish or milk. Soybean is now widely consumed and readily used in the production crude vegetable oil, soymilk, soy yoghurt and *dawadawa*. In addition to that, a local but good seasoning is also produced from soybean.

Soybean is a staple food of great nutritional value. Its importance ranges from milk production, oil processing livestock feeds, industrial uses and human consumption of soybean. Soybean has been recognized to be an ideal grain for meeting protein and energy requirement of both man and animal. Soybean is probably the world's most valuable crop, used as feed by billions of livestock, as a source of dietary protein and oil by millions of people, and in the industrial manufacture of thousands of products. Soybean is such an extremely rich source of protein and fat, and such a good source of energy, vitamins and minerals with an average production cycle of 90-110 days from planting to harvesting.

Complete utilization of soybean includes in addition to post-production aspects, the application of a range of technologies and including food processing technology, food science and nutrition, food technology, commercial soya foods production, marketing, and nutritional and health factors. When the pressing needs to alleviate poverty and malnutrition and to improve the welfare of poor people are considered, issues relating to high quality protein food, greater income opportunities for male and female are of paramount importance.

Protein content is approximately 40% and fat 20% with considerable variations depending on the cultivars. Soybean is regarded as equal in protein to animal foods. It has

been found to be excellent for a number of different conditions such as high blood pressure, diabetes– related diseases and many others. According to Olatunji *et.al.* (2011), soybean can be as a nutritional supplement for pregnant women, lactating mothers and children. The household use of soybean is targeted to suit local dishes for Nigerians and communities all over the country. About 140 soybean products are now available (Okoruwa, 2002).

A key problem associated with soybean is that it contains some anti-nutritional factors, which inhibit the availability of the desirable elements such as protein. Fortunately most of these anti-nutritional factors can be destroyed through processing and boiling. Major processing of these products includes cleaning, soaking, de-husking, milling, sieving, boiling, roasting and fermentation, further processing depends on the type of products to be produced. Soybean is reputed to be able to several institutions responsible for creating awareness lower total cholesterol levels by 30% (Desroches et al., 2004).

Beneficial effects of soybean on cholesterol these include Agricultural Development Project (ADP), concentrations have recently culminated in the U.S. Food IITA, National Agricultural Extension Research and Liaison Services (NAERLS) and others. Health Benefits from Soybean consumption: content of soybean can cause expansion of the consumption of foods containing soybean and peripheral blood vessels thereby helping to decrease soybean constituents has been associated with blood pressure to prevent hypertension (Lijuan, et al., 2000). Men which were at risk of developing coronary osteoporosis, alleviation of menopausal symptoms, and heart disease consuming soybean in diets have been reduced cancer risk and in a limited number of studies found to have significant reductions in both diastolic and reduced diabetes. It also helps people to stay lean systolic blood pressure (Sagara *et al.*, 2014).

Isoflavone compounds found in Soybean can be very beneficial to diabetic patients' soybean; especially genistein may help to stay lean by particularly Non-Insulin Dependent

Diabetes Mellitus causing us to produce fewer and smaller fat cells. Soybean works in the prevention of protein and fibre in soybeans can prevent high blood minimizing the conditions through controlling sugar level and help in keeping blood sugar levels cholesterol, blood pressure, and vascular function and direct under control. It is also now known that the proportion of it is also now known that the very high magnesium potassium to sodium (ratio 3/1 – 11/1) makes soybean an ideal food for diabetes mellitus patients (Lijuan *et al.*, 2000).

Soybean has also been shown to promote serum insulin production (Fukushima, 2000). It has been demonstrated that soya protein helps persons with diabetes prevent kidney diseases and improve the cholesterol profile (Teixeira et al., 2000). There is evidence that soya foods may help reduce bone loss that typically occurs after menopause. Soya isoflavone can help women with low bone mineral content prevent hip fractures in postmenopausal years (Chen et al., 2003). Soybean is thus particularly important in postmenopausal years because it prevents hip fractures, reduces fat development especially abnormal fat and blood pressure (Anderson, 2003).

It is also known to inhibit cancer development the second leading cause of death, which in the U.S is responsible for the death of about 552,000 people in 2000 (1,500 death per day) . High fibre soybeans are able to help reduce the risk of colon cancer. In areas of the world where soybeans are eaten regularly, rates of colon cancer, as well as some other cancers including the breast cancer tend to be low. Soybean contains relatively high amounts of glucosylceramide, which may be the reason for the cancer-preventive effect of eating soya foods (Symolon et al., 2004).

Soybeans may be the most practical means of relief from kwashiorkor (Protein Calorie Malnutrition), which is increasing in prevalence among children in many parts. Processing of soybean seeds into soybean curd (Grewal, 2000). It may be concluded from the foregoing account on nutritive and health values that with soybean the house wife can vary

her dishes by replacing meat, fish, cow's milk etc. partly or entirely with the low cost food Steaming at 100 C inactivates the anti-nutritional factors of in raw soya flour, thus rendering a maximum protein efficiency ratio. Soya milk should always be boiled for 5 to 10 minutes before consumption, so that no active inhibitor and no active haemagglutinins will be present.

According to Olatunji *et.al* (2012), reported that the more the degree of processing of soybean, the higher the digestibility. Major processing methods include soaking, dehusking, roasting and milling. It could be milled into paste or flour depending on the type of food preparation method to be used.

2.9.5 Cassava processing Activities

Cassava is one of the most important staple food crops grown in tropical Africa. It plays a major role in efforts to alleviate the African food crisis because of its efficient production of food energy, year-round availability, tolerance to extreme stress conditions, and suitability to present farming and food systems in Africa. Traditionally, cassava roots are processed by various methods into numerous products and utilized in various ways according to local customs and preferences. In some countries, the leaves are consumed as vegetables, and many traditional foods are processed from cassava roots and leaves. Improvement of cassava processing and utilization techniques would greatly increase labour efficiency, incomes, and living standards of cassava farmers and the urban poor, as well as enhance the shelf life of products, facilitate their transportation, increase marketing opportunities, and help improve human and livestock nutrition.

Fresh cassava roots cannot be stored for long because they rot within 3-4 days of harvest. They are bulky with about 70% moisture content, and therefore transportation of the tubers to urban markets is difficult and expensive. The roots and leaves contain varying amounts of cyanide which is toxic to humans and animals, while the raw cassava roots and uncooked leaves are not palatable. Therefore, cassava must be processed into various forms

in order to increase the shelf life of the products, facilitate transportation and marketing, reduce cyanide content and improve palatability. The nutritional status of cassava can also be improved through fortification with other protein-rich crops. Processing reduces food losses and stabilizes seasonal fluctuations in the supply of the crop.

Traditional cassava processing methods in use in Africa probably originated from tropical America, particularly north eastern Brazil. The processing methods include peeling, boiling, steaming, slicing, grating, soaking or seeping, fermenting, pounding, roasting, pressing, drying, and milling. These traditional methods give low product yields which are also of low quality. Rapid urbanization in tropical Africa increased mobility in both rural and urban areas and the changing roles and status of women have resulted in an unprecedented demand for convenience foods. Added to these factors is the high cost of fuel for cooking in urban areas at a time when fuel wood is not only inconvenient to use but is becoming increasingly scarce.

Therefore, cassava processing and utilization technologies for the future should improve traditional methods and develop low cost equipment with low energy demands. Improved processing and utilization technologies should address issues related to farmers' (producers') and consumers' needs (particularly urban needs in future), and also to economic factors and nutritional values. Knowledge of the current traditional processing and utilization methods and of present urban patterns of consumption and changing urban needs will guide future strategies for cassava processing and utilization. Improvement of nutritional values of processed products also requires special attention from policymakers and researchers.

Cassava is frequently denigrated because its roots are low in protein. However, protein may be supplemented from other sources, particularly legumes; for example, fortification of cassava flour or gari with protein-rich soy flour can be achieved. Such fortified products will be nutritionally advantageous, and thus economical and acceptable to

consumers. Although cassava is regarded as subsistence crop of low-income families or as a "famine-reserve crop".

2.9.5.1 Processing techniques and reduction of cyanide in cassava

Cassava contains the cyanogenic glucosides, linamarin and lotaustralin which are hydrolyzed after tissue damage, by the endogenous enzyme, linamarase to the corresponding cyanohydrins and further to hydrogen cyanide [HCN]. The hydrogen cyanide is responsible for chronic toxicity when inadequately processed cassava products are consumed by humans and animals for prolonged periods. Therefore, traditional processing procedures must aim at reducing cyanide and improving storability, convenience and palatability. Cassava processing procedures vary, depending on products, from simple processing (peel, boil and eat) to complicated procedures for processing into gari, for example, which involve many more steps, namely peeling, grating, pressing, fermenting, sifting, and roasting. Some of these steps reduce cyanide more effectively than others.

Processing techniques and procedures differ with countries and localities within a country according to food cultures, environmental factors such as availability of water and fuelwood, the cassava varieties used, and the types of processing equipment and technologies available. The most important traditional culinary preparations of cassava in Africa are "boiled or roasted roots", "fufu" (cassava flour stirred with boiled water over a low-heat fire to give a stiff dough), "eba" (gari soaked in hot water to produce a thick paste) and "chickwangu" (steamed fermented pulp wrapped in leaves).

2.9.5.2 Fermentation in cassava processing

Fermentation consists of two distinct methods: aerobic and anaerobic fermentation. For aerobic fermentation, the peeled and sliced cassava roots are first surface-dried for 1-2

hours and then heaped together, covered with straw or leaves and left to ferment in air for 3-4 days until the pieces become mouldy. The fermented mouldy pieces are sun-dried after the mould has been scraped off. The processed and dried pieces (called "Mokopa" in Uganda) are then milled into flour, which is prepared into a "fufu" called "kowan" in Uganda. The growth of mould on the root pieces increases the protein content of the final products three to eight times. This fermentation method is also very popular in other parts of East Africa such as Tanzania, Rwanda, and Zaire.

In anaerobic fermentation, grated cassava for processing into "gari" is placed in sacks and pressed with stones or a jack between wooden platforms. Whole roots or pieces of peeled roots for processing into "fufu" are placed in water for 3-5 days. During the first stage of gari production, the bacterium *Corynebacteria manihot* attacks the starch of the roots, leading to the production of various organic acids (such as lactic and formic acids) and the lowering of substrate pH. In the second stage, the acidic condition stimulates the growth of a mold, *Geotrichum candida*, which proliferates rapidly, causing further acidification and production of a series of aldehydes and esters that are responsible for the taste and aroma of gari .

The optimum temperature for the fermentation for gari processing is 35°C, increasing up to 45°C. For "lafun" production in Nigeria, peeled or unpeeled cassava tubers are immersed in a stream, in stationary water (near a stream) or in an earthenware vessel, and fermented until the roots become soft. The peel and central fibres of the fermented roots are manually removed and the recovered pulp is hand mashed or pounded. The microorganisms involved in "lafun" production include four yeasts: *Pichia onychis*, *Candida tropicalis*, *Geotrichum candida*, and *Rhodotorula* sp.; two molds: *Aspergillus niger* and *Penicillium* sp.; and two bacteria: *Leuconostoc* sp. and *Corynebacterium* sp. Moisture, pH and temperature

conditions are critical for the growth of these microorganisms in roots and thus for fermentation.

During or after fermentation of roots for gari production, the grated pulp is put in sacks (jute or polypropylene) on which stones are placed or jacked-wood platforms are set to drain or press off the excess liquid from the pulp. In Zaire, the cassava pulp is taken out and heaped up on the racks in the sun for further fermentation and draining of the excess moisture. In this way, much of the cyanide is effectively lost with the liquid. The following are the steps in cassava processing:

- Drying

Drying is the simplest method of processing cassava. Drying reduces moisture, volume and cyanide content of roots, thereby prolonging product shelf life. This processing is practiced primarily in areas with fewer water supplies. Total cyanide content of cassava chips could be decreased by only 10-30 percent through fast air drying. Slow sun-drying, however, produces greater loss of cyanide. Sun-drying the peeled cut pieces of roots gave a HCN concentration lower than 10 mg/100g and loss was more effective than oven drying. Drying may be in the sun or over a fire. The former is more common because it is simple and does not require fuelwood.

- Boiling

Boiling the peeled roots did not effectively remove HCN. Pounding the boiled roots into "pounded fufu" decreased the HCN concentration by only 10 percent. Therefore, only cultivars containing low cyanide are recommended for this method of preparation.

- Milling

The dried root pieces and fermented/dried pulp are milled into flour by pounding in mortar or using hammer mills. Milling with hammer mills, done at village level, may also reduce cyanide. The dried cassava roots (both fermented and unfermented) are often mixed in a ratio of 2-3 parts cassava with one part of sorghum, millet and/or maize and milled into composite flour. Mixing cassava with cereals increases food protein, and enhances palatability by improving consistency.

2.9.5.3 Processed products and equipment of cassava

- Gari

Fresh roots are peeled and grated. The grated pulp is put in sacks (Jute or polypropylene) and the sacks are placed under heavy stones or pressed with a hydraulic lack between wooden platforms for 3-4 days to express excess liquid from the pulp while it is fermenting. Fermentation imparts an acidic taste to the final product. The dewatered and fermented lumps of pulp are crumbled by hand and most of the fibrous matter is removed. The remaining mass is sieved with traditional sieves (made of woven splinters of cane) or iron or polyethylene mesh. After being sieved, the fine pulp is then roasted in an iron pan or earthen pot over a fire. If the sieved pulp is too wet, it takes longer to roast resulting in a finished lumpy product with dull colour.

Palm oil may be added to prevent the pulp from burning during roasting and to give a light yellow colour to the gari. When palm oil is not added, a white gari is produced. Palm oil contains substantial quantities of vitamin A, therefore, yellow gari is 10-30 percent more nutritious and expensive than white gari. The garification or conversion rate of fresh roots into gari is 15-20 %. This value varies with cassava varieties, time of harvesting, age of plant

and other environmental factors. Gari is very popular in Nigeria and less so in Cameroon, Benin, Togo, Ghana, Liberia, and Sierra Leone. In Brazil, this method is used for the production of "farinha de mandioca".

Peeling is done mainly by women and children. The peeled roots are grated by women, using a simple traditional grater, but it is done by men if a power driven grater is used. Pressing is done by women in the traditional way but done by men when a hydraulic presser is used. The sieved fermented pulp is roasted almost exclusively by women in a pan or pot on the fire with fuel wood as the energy source.

- Fermented and dried cassava pulp

"Lafun" in Nigeria, "cossettes" in Zaire and Rwanda, "kanyanga" and "mapanga" in Malawi, and "makopa" in Tanzania are various names for fermented and dried cassava products. The processing method to ferment and dry cassava pulp is very simple and does not require much labor. It is thus widely used for processing high cyanide cassava varieties in many parts of Africa where water for soaking is available. Whole or peeled roots are immersed in water for 3-4 days for fermentation and softening the tissues. The fermenting roots are then removed and broken into small crumbs, sun-dried on mats, racks, fiat rocks, cement floors or roofs of houses. Drying the fermented roots takes 1-3 days, depending on the prevailing weather. The dried crumbs are then milled into flour.

- Wet pulp

The processing procedures for "wet pulp" and of fermented and dried pulp production are similar except for the drying. The wet pulp may be moulded into balls, 3-5 cm diameter, put in boiling water and stirred thoroughly to obtain a stiff Wet pulp of about 0.5-1.0 kg is packed in a plastic or polypropylene bag and marketed in cities in Nigeria, Ghana and

Cameroon. Urban dwellers therefore do not need to buy fresh roots for processing into wet pulp to prepare wet fufu.

- Smoked cassava balls ("kumkum")

Cassava is processed into smoked cassava balls in the same way as fermented and dried pulp is produced except that the fermented wet pulp is pounded and molded into round balls of about 4-7 cm diameter. These balls are then smoked and dried on a platform above the fire place in a special structure hung above the hearth. The dark coating caused by smoke is cleaned off and the cleaned balls are milled into flour before reconstitution into fufu.

- Starch

Cassava roots are peeled, washed and grated. The grated pulp is steeped for 2-3 days in a large quantity of water, stirred and filtered through a piece of cloth. The filtrate stands overnight and the supernatant is then decanted. The starch sediments are air-dried under shade.

- Dried cassava

The roots are peeled, sliced into small pieces and sun-dried on racks or roofs for 4-5 days or sometimes up to 3 weeks, depending on the weather and the size of pieces. Later, sun-dried pieces are milled into flour. This processing system is very simple but the processed products contain considerable amounts of cyanide. This method is widely used in many areas in Africa, particularly where water supply for fermentation is seriously limited.

Traditional cassava processing does not require sophisticated equipment. Processing cassava into gari requires equipment such as grater, presser and fryer. The traditional cassava grater is made of a flattened kerosine tin or iron sheet perforated with nails and fastened onto

a wooden board with handles. Grating is done by rubbing the peeled roots against the rough perforated surface of the iron sheet which tears off the peeled cassava root flesh into mash. In recent years, various attempts have been made to improve graters. Graters which are belt-driven from a static 5 HP Lister type engine have been developed and are being extensively used in Nigeria. Its capacity to grate cassava is about one ton of fresh peeled roots per hour.

For draining excess liquid from the grated pulp the sacks containing the grated pulpy mass are slowly pressed down using a 30-ton hydraulic jack press with wooden platforms, before sieving and roasting into gari. Stones are used in traditional processing to press out the excess moisture from the grated pulp. Tied wooden frames are used for this purpose in places where stones are not available. Pans made from iron or earthen pots are used for roasting the fermented pulp. Fuel wood is the main source of energy for boiling, roasting, steaming and frying. Fuel wood may not be easily and cheaply obtained in the future because of rapid deforestation.

Slight changes in the equipment used in processing can help to save fuel and lessen the discomfort, health hazard, and drudgery for the operating women. The economic success of any future commercial development of cassava processing would depend upon the adaptability of each processing stage to mechanization. However, the first step to take for improvement of cassava technologies should be to improve or modify the simple processing equipment or systems presently used, rather than to change entirely into a new, sophisticated, and expensive equipment.

2.9.6 Storage of cassava processed products

Processing, particularly drying and roasting, increases shelf life of cassava products. Good storage depends on the moisture content of the products and temperature and relative

humidity of the storage environment. The moisture content of gari for safe storage is below 12.7%. When temperature and relative humidity are above 27°C and 70% respectively, gari goes bad. The type of bag used for packing also affects shelf life depending on the ability of the material to maintain safe product moisture levels. Jute and hessian bags are recommended in dry cool environments because they allow good ventilation. When gari, dried pulp and flour are well dried and properly packed, they can be stored without loss of quality for over one year.

2.9.7 Utilization of processed cassava products

Utilization in this paper includes cooking or preparation, and consumption. Cooking cassava consists of boiling, steaming, roasting and pounding. The peeled fresh cassava roots are eaten raw or eaten boiled and roasted. The fresh roots are boiled and pounded to obtain "pounded fufu". This is most popular in Ghana, and to some extent, in Nigeria and Cameroon. The processed cassava, either in the form of flour, wet pulp or gari is cooked or eaten in three main food forms: "fufu", "eba" and 'lafun'. Gari can be eaten dry or it may be soaked in cold water to which sugar is added. "Eba" is a very popular food in Nigeria and is gaining popularity in Cameroon, Benin, Ghana, Liberia and Sierra Leone because of its fast and easy reconstitution into a convenient food.

2.10 Impact assessment of development project

Impact assessment is the process of identifying the consequences of an intervention. It is a means of measuring the effectiveness of organisational activities and judging the significance of changes brought about by those activities. It is used to ensure that project; programmes are economically viable, socially equitable and environmentally sustainable. Impact evaluation can explore unintended consequences, whether positive or negative on

beneficiaries. Of a particular interest is the extent to which project benefits reach the poor and the impact of these benefits have on their welfare status. There are three interrelated challenges that impact assessment studies face – establishing a viable counterfactual (the predicted outcome in the absence of the intervention, that is, what would have happened to the beneficiaries if they had not participated in the project); attributing the impact to an intervention; and coping with long and unpredictable time lag (Salter and Martin, 2001).

The crucial feature of the evaluation problem for an existing program is that the same person is not observed in both states (hypothetical and counterfactual). This is called the problem of causal inference by some statisticians. Therefore, to ensure methodological rigour, measuring programme impact on beneficiaries requires a strategy to estimate the counterfactual state of participants which is by definition unobservable, or what would have happened had the intervention not taken place. Due to the fact that the counterfactual is not observable, impact evaluations must include some form of appropriate comparison or control group. To determine the counterfactual, it is necessary to net out the effect of intervention from other factors. This can be solved using experimental and non experimental approaches.

2.11 Propensity score matching

The idea behind matching is simply to select a group of non-beneficiaries in order to make them resemble the beneficiaries in everything. If such resemblance is satisfactory, the outcome observed for the matched group approximates the counterfactual, and the effect of the intervention is estimated as the difference between the average outcomes of the two groups. The fundamental assumption for the validity of matching is that, when observable characteristics are balanced between the two groups, the two groups are balanced with respect to all the characteristics relevant for the outcome. The larger the number of available pre-intervention characteristics, the better the chance that this assumption holds true. The

existence of a substantial overlap between the characteristics of beneficiaries and non-beneficiaries is another requirement for the applicability of this method. The method of matching has an initiative appeal because by constructing a control group and using difference in means, it mimics random assignment. The crucial difference with respect to an experiment is that in the latter the similarity between the two groups covers all characteristics, both observable and unobservable, while even the most sophisticated matching technique must rely on observable characteristics only. The estimated probability of being a beneficiary given observable characteristics. This reduces the matching from beneficiaries given observable characteristics. This reduces the matching from multi-dimensional problem (where the number of dimension depends on the number of available) to a one – dimensional problem. Intuitively, each beneficiary, where this probability is calculated on the basis of individual characteristics. Once the two groups are formed, the average effect is estimated for each outcome by simply corrupting the difference in means between the two groups. Also Propensity Score Matching (PSM) has some advantages over econometric regression methods since it compares only the comparables, it does not rely on parametric assumptions to identify the impact of projects. However, PSM is subject to the problem of “selection on unobservable characteristics”, meaning that the beneficiary and comparison groups may differ in unobservable characteristics, even though they are matched in terms of observable characteristics.

2.12 Measures of household welfare status

Household surveys are an essential source of information on economic and social conditions of households and individuals. Surveys data can be used to measure the welfare of households, poverty, and how equally distributed are living standards. Moreover, welfare measures allow investigating patterns in standards of living across populations and over time. Welfare is usually proxy by measures of consumption or income. However, in recent years,

the use of asset-based wealth indices as an alternative metric measure of welfare has become increasingly prominent. Indeed, wealth indices represent the only way to investigate distributional aspects in uniquely detailed large-scale surveys – such as MICS (Multiple Indicator Cluster Surveys) and DHS (Demographic and Health Surveys) – that lack information on income and/or consumption (Howe et al., 2010).

The wealth index has more recently, been considered a theoretically and practically superior alternative measure of economic status to income and consumption (Rutstein, 2008). Wealth better reflects long-term welfare as it is less volatile than both income and consumption; it is considered more suitable to analyse multi-dimensional poverty (Filmer and Pritchett, 2001); and finally it is less data intensive and therefore easier to calculate (Azzarri et al., 2006). However, these features make the wealth index a specific indicator and as such it cannot be comparable to the conventional measures of economic status. Different studies report that the asset index is in fact a generally poor proxy for current household income or expenditure, while it may be a good proxy for long-term or permanent income. Furthermore, there are a number of conceptual and pragmatic reasons that limit the use of asset-based indices as alternative measures of welfare. The wealth index provides a relative measure of welfare – namely a household's wealth is measured relative to other households in the sample – but does not quantify the household's current levels of welfare or poverty (Filmer and Pritchett, 2001).

The wealth index – as most commonly constructed – has also been found to have an urban bias and limited discriminatory power at the lower end of the wealth distribution. Moreover, differences in price levels across regions are not taken into account in the asset-based approach (Filmer and Pritchett, 2001; Rutstein, 2008; Howe et al., 2010). In order to obtain a good measure of welfare, consumption should be comprehensive, the questionnaire should cover all components of consumption and all types of consumption. Collecting

information only on a subset of consumption could result in bias: as Deaton and Grosh (2000) put it “the relationship between the part and the whole can vary a great deal from one household to another and from one place or time to another”, therefore the omission of some components could affect the ranking.

Consumption usually includes:

- 1) food consumption,
- 2) non-food items (including health, education and other non-food expenditures),
- 3) housing expenditures (including rent and utilities) and
- 4) consumer durables.

Food consumption comprises food consumed inside the household from a variety of sources (food purchases, self-produced food, food received as gifts, remittances and payments in kind) and food consumed outside the household (restaurants etc.). In order to give a value to food consumption that does not go through the market (i.e. consumption from home production) household surveys need to collect information on prices. There are however a number of theoretical and practical challenges in doing so (Deaton and Zaidi, 2002). Deaton and Zaidi (2002) recommend the inclusion of education expenditures although they highlight that: - they could be considered an investment rather than consumption..

Non-food items refer to education (such as tuition fees, textbooks, etc.), health (medical care and health expenses) and a wide range of other non-food expenses (such as domestic fuel and power, tobacco products, clothing and footwear, transport, recreation, personal care, miscellaneous goods and services).

A choice however has to be made in terms of the items to include. It is usually recommended to include education expenditures, and to exclude taxes and levies as well as gifts and transfers (Deaton and Zaidi, 2002). The inclusion of health expenditure is debated. As highlighted by Deaton and Zaidi (2002), it is difficult to measure the increase in welfare

from health expenditures, as information would be needed on the loss of welfare from illness on one hand and on the increase in welfare from its alleviation on the other hand. If health expenditures only are accounted for, then differences between two sick people – of whom only one is able to pay for treatment – are missed. The recommendation is to include or exclude these expenditures based on the analysis of the elasticity of health expenditures with respect to total expenditure (inclusion is suggested when the elasticity is high).

The inclusion of lumpy and less frequent expenditures – ceremony-related such as marriages and dowries, births, and funerals – is also an issue when trying to capture consumption. These infrequent outlays are usually not included in the consumption aggregate given their ‘idiosyncratic nature and infrequency’ (Beegle et al., 2010). Collecting this kind of expenditure is in fact likely to result in a bias as there will be households that have incurred this type of expenditure in the individual indicators are not grounded theoretically and the appropriateness of the wealth index is likely differ across sub sub-groups of the population. Depending on the purpose of the research, the indicators included in the index might have direct effects on the outcome of interest (Howe et al., 2008).

Finally, substantial concerns emerged with regard to the use of the wealth index for welfare comparison over time and across countries. Although recent studies have proposed methodologies to allow for inter-temporal and intraregional comparisons (Booyesen et al., 2008; Howe et al., 2010), they do not convincingly overcome the observed limitations. Therefore, for a series of theoretical as well as practical reasons, the wealth index cannot be used as a perfect substitute for income or consumption which, among other considerations, remain the most common and accepted measures of welfare.

Researchers have debated intensely on the strengths and weaknesses of different welfare indicators with a quite clear consensus on favouring consumption over income, especially in a developing country context. In the first place, individuals derive material well-

being from the actual consumption of goods and services rather than from the receipt of income per se; therefore consumption seems to better capture the concept of 'standard of living'. Deaton and Zaidi (2002) argue that consumption better reflects long-term income as it is not closely tied to short-term fluctuations in income and is smoother and less variable than income.

Income is more likely to be affected by seasonal patterns resulting either in an underestimation or overestimation of real income. Consumption is more stable especially in agricultural societies as it is smoothed over the seasons, therefore better reflecting (or approximating) the real living standard.

2.12.1 Asset Indices as an alternative measure of welfare status

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CHAPTER THREE

3.0 THEORETICAL AND CONCEPTUAL FRAMEWORK

3.1 Theoretical framework

Theory is a coherent group of assumptions put forth to explain the relationship between two or more observable facts which can be used to provide a sound basis for predicting future events (Augustine, 2013). The following theories were considered relevant to this study.

- (1) Knowledge gap theory
- (2) Women empowerment theory
- (3) Sustainable development theory

3.1.1 Knowledge gap theory

Tichenor, Donohue and Olien at the University of Minnesota proposed the knowledge gap theory in 1970. They believed that every member of the society does not evenly acquire the increasing information in the society. People that are better-off welfare status tend to have better access to information than those that are worse-off welfare status. This leads to a division of two groups: A group of better educated people knows more and a group with low education knows less. Lower welfare status of people defined partly by educational level have little or no knowledge on public affairs issues, are disconnected from new events and important discoveries, and usually are not concerned about their lack of knowledge.

The knowledge gap theory is premised on the assumptions that knowledge gap can results in an increased gap between people that are worse-off in welfare status. The importance of welfare status in bridging the gap or at least reducing it stressed in this theory

makes the theory applicable to this study. If rural development project is able to improve the welfare status of the rural women processors, it means their processing business will experience a resultant development through closer access to relevant social and economic information, resources, and supports. This theory explains that when beneficiaries acquire knowledge through training, they will use the knowledge acquired to improve their standard of living.

3.1.2 Women empowerment theory

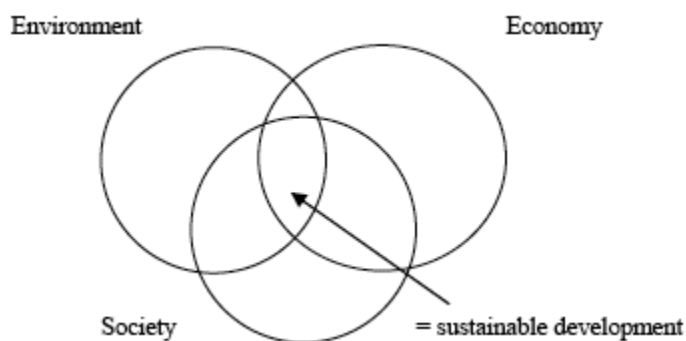
The theory of empowerment is promoted in work environments that provide employees with access to information, resources, support, and the opportunity to learn and develop. Psychological empowerment includes feelings of competence, autonomy, job meaningfulness, and an ability to impact the organization. Employees who are empowered are more committed to the organization, more accountable for their work, and better able to fulfil job demands in an effective manner. This theory shows how structures within the workplace that facilitate access to resources can empower employees to accomplish their work in more meaningful ways. This study relates empowerment to commitment. The goal of this theory is to enhanced increase access to information, knowledge, and opportunities, so as to improve their standard of living. This model emphasises the need for women to increase their power and have control over productive resources and choices of their life. Power in this context is regarded as an exchange rather than domination and control as it is traditionally perceived. Through adequate control of productive resources women are expected to influence their social and economic progress. This model does not mean that as women gain, men will lose power but emphasises the need of women to increase their capacity and generate more income, so that they can improve their welfare status.

3.1.3 Sustainable development theory

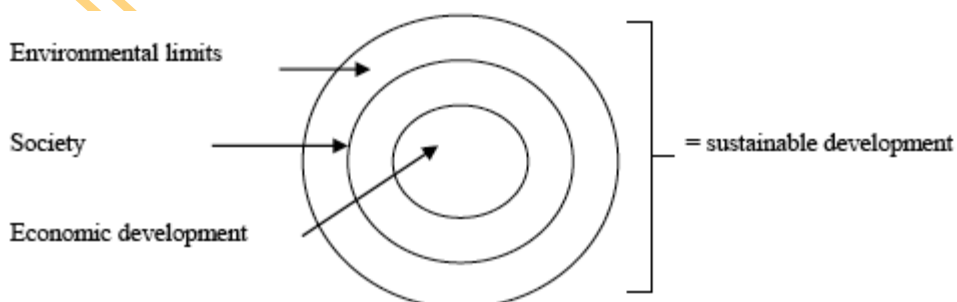
The Russian doll model upholds the basic principle that all economic activity should be bent towards social progress and that this must be achieved within environmental limits. There is, therefore, suggestion of a slight move away from the 'weak sustainability' model that was originally put forward by Brundtland towards a more eco-essential approach. The potential to achieve 'win-win-win' scenarios is increasingly being rejected as over-simplistic and practicably unattainable.

Venn diagram to Russian doll explanations of Sustainable Development

Venn diagram explanation



Russian doll explanation



3.2 The conceptual framework for the study

The conceptual framework of this study is an outline that shows the linkages between the variables of the study. The socioeconomic and enterprise characteristics of respondents influence the level of participation in the project. For example the higher the educational level of respondents, the better they participate in the DELPHE project. Also the more they earn higher income the more their regular payment of dues towards the project. The higher their years of experience, the better their participation in training activities of the project. Participation in the project training activities will make them acquire knowledge on their various processing enterprises. The respondents' enterprise characteristics influence knowledge on their various processing activities which in turn has a two way relationship with attitude of respondents towards the DELPHE project. Respondents with higher knowledge may have favourable attitude than others with low knowledge. Respondents' with favourable attitude benefitted in the project than those with unfavourable attitude towards the project. The constraints faced by the respondents on various processing enterprises influences the benefits derived from the project and a direct relationship with welfare status.

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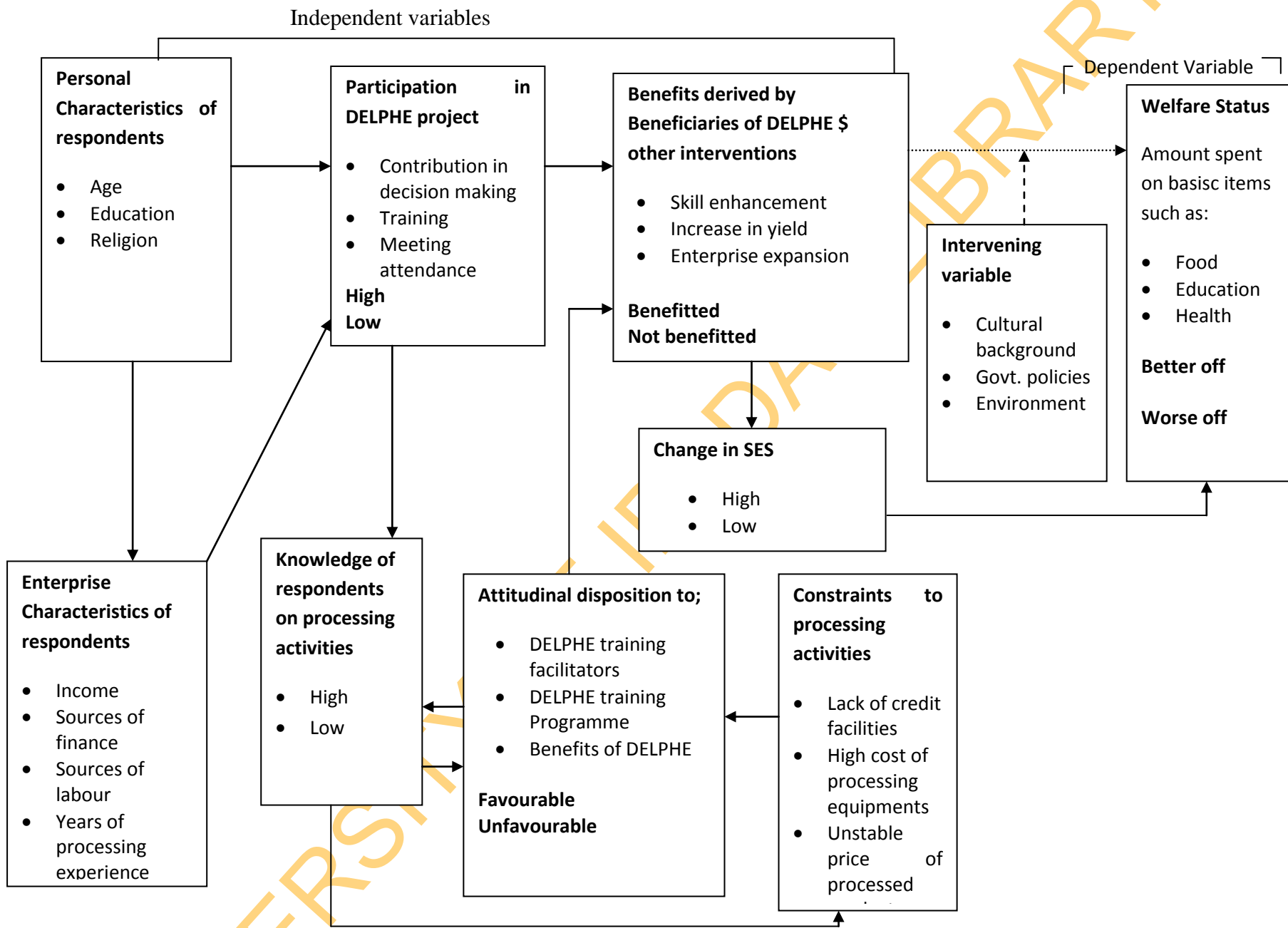


Figure 1.1: Framework on the effects of DELPHE project on welfare status of rural women processors in Oyo and Osun States

METHODOLOGY

4.1 Area of study

The study was carried out in Oyo and Osun States of Nigeria. These are the two states selected for the project in Nigeria.

Oyo State is located in the Southern geo-political zone. Oyo state is between latitude $8^{\circ}00'00''\text{N}$ and longitude $4^{\circ}00'00''\text{E}$. The state capital is Ibadan and it has thirty three Local Government Areas distributed among three Senatorial districts. It is bounded in the North by Kwara State, in the South by Ogun State, to the East by Osun State and to the West by Republic of Benin. The total population of the state is 5591,589 (NPC, 2006) and land mass covers about 27249 sq km

Osun state was carved out of Oyo state on August 27th, 1991 with its headquarters in Oshogbo. Osun State has 30 Local government areas.. The state lies in the southwest of the Niger valley in the savannah and rainforest zones of the country. It lies between latitude $7^{\circ}00'$ and $9^{\circ}00'$ N and Longitude 2.75° and 6.75°E . It covers a total area of approximately 37,680km². The state is bounded in the north by Kwara State and Ekiti state and west by Oyo state.

The two states fall in the derived savannah ecological zone. The climates of the two states are wet and dry seasons. The rainy season lasts up to 9 months with two peaks in July and September. The mean monthly temperature range is 18°C - 21°C . Oyo Most of the people in the areas are predominantly Yorubas. A large number of the people engage in agriculture, and processing of food crops for domestic consumption and for export. Large segments of the populace are also traders and artisans.



Figure 4.1. Map of Oyo state showing its local government areas



Figure 4.2: Map of Osun state showing its local government areas

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4.2 Population of the study

The study population comprised of all rural women processors in the two states where DELPHE project was executed. They include the beneficiaries and non beneficiaries of DELPHE project, who are involved in the processing of Moringa, Soybean, Cassava and Oil palm.

4.3 Sampling procedure and sample size

Multistage sampling procedure was used to select respondents for the study. Oyo and Osun states were purposively selected for the project being the only two states where the project was implemented in Nigeria. Six LGAs; four from Osun namely: Ife East, Egbedore, Ede South, Obokun, LGAs and two from Oyo state (Iddo and Akinyele (LGAs)) were selected purposively being the local government areas where the project was implemented. Stratified sampling technique was used to select two groups from each of the communities in the local government areas based on the enterprise categories. The total beneficiaries for the Moringa processing enterprise were 95 women processors, comprising of 35 in Iyanfoworogi community, 30 in Olode comunity and 30 in Ayeso community.

For Soybean enterprise, the total beneficiaries were 65 women processors, comprising of 30 and 35 women processors in Ojo and Aro communities respectively while the total beneficiaries in Cassava enterprise were 150 women processors with 40, 45, 35, and 30 in each of Owode, Sekona, Moniya and Idi-ose communities respectively. The total beneficiaries were 405. Proportionate sampling technique was used to randomly select 60% of the 405 beneficiaries, which is two hundred and forty three (243), representing the number of beneficiaries selected.

Equal numbers of non beneficiaries were selected randomly from the non participating communities within the same LGA. The total processors for the Moringa processors enterprise were 90 in Ife east L.G.A, comprising of 30 women processors in Peregun community, 30 women processor in Omifufun and 30 in Ido oko. For the Soybean enterprise, total non-beneficiaries were 80 women processors, comprising of 35 and 45 in Ikotun and Awoye respectively while the total processors for palm oil enterprise were 100, comprising of 30 women processors in Ada owode community, 30 in Akufo community and 40 in Awotan. The total processors for cassava processing enterprise were 135 women processors with 45, 30, 30, 30, and 30 in each of Oke Egan, Ile Ato, Apete, and Omi adio communities respectively. This gives a total of 405.

A proportionate sampling technique was used to randomly select 60% of the 405, which is 243, representing the number of non beneficiaries selected. The Kernel Calliper Method of Propensity Score Matching (PSM) test which reduces bias was carried out between the beneficiaries and non beneficiaries, and the total number of beneficiaries that matched was 216 for the beneficiaries and 88 for the non-beneficiaries. Therefore, after the propensity score matching, the total respondents sampled were 304, with 96 beneficiaries from Oyo state and 120 from Osun state, while 32 and 56 were non-beneficiaries from Oyo and Osun states respectively. The aim of PSM is to find the comparison group of sample of non beneficiaries that is closest to the sample programme beneficiaries so as to get the impact of the project on beneficiaries.

Table 4.1: Sampling of respondents

Beneficiaries			Non-Beneficiaries					
State	LGA	Selected Communities based on ent. Categories	No. Processors in grp	Of 60% processors each selected	Of 60% of women processor or selected			
Osun	Ife East	Iyanfoworogi (Moringa)	35	21	Peregun (Moringa)	30	18	
		Isoya (Moringa)	30	18	Omifunfun (Moringa)	30	18	
	Egbedore	Ojo (Soybeans)	30	18	Ikotun (Soybean)	35	21	
		Aro (Soybean)	35	21	Iwoye (Soybean)	45	27	
	Ede South	Owode (Cassava)	40	24	Oke-Egan (Cassava)	45	27	
		Sekona (Cassava)	45	27	Ile Ato (Cassava)	30	18	
	Obokun	Ayeso (Moringa)	30	18	Ido Oko (Moringa)	30	18	
		Afin Esa oke (Palm oil)	30	18	Ada Owode (Palm oil)	30	18	
	Oyo	Iddo	Omi Adio (Palm oil)	30	18	Akufo (Palm oil)	30	18
			Awotan (Palm oil)	35	21	Apete (Palm oil)	40	18
Akinyele		Moniya (Cassava)	35	21	Laniba (Cassava)	30	18	
		Idi ose (Cassava)	30	18	ajibode (Cassava)	30	18	
Total			405	243		405	243	
PSM				216			88	

Table 4.2: Number of matched respondents after the PSM

Processing category	No of beneficiaries	No of beneficiaries (Oyo)	No of beneficiaries (Osun)	No of Non-beneficiaries	No of beneficiaries from State	No of beneficiaries from Oyo State	No of beneficiaries from Osun State	Total no of respondents sampled
Moringa	46	20	26	21	8	11	67	
Soybean	30	13	17	10	5	8	40	
Cassava	76	35	41	32	10	24	108	
Palm oil	64	28	36	25	9	13	89	
Total	216	96	120	88	32	56	304	

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4.4 Instrument for data collection

Both qualitative and quantitative methods were used to collect information. Structured questionnaire with various items was designed to elicit information from the respondents with respect to study objectives while Focus Group Discussion (FGD) was used to collect qualitative data. Eight FGDs were conducted in all from each of the beneficiaries processing groups (4 in Osun state and 4 in Oyo state). The FGDs were guided by the following questions:

- Products that the women process and the number of years they have been involved in processing
- Major alternative sources of income generating activities.
- Awareness about participation in the DELPHE project.
- The benefits derived as a result of participating in the project and other programmes
- The training exposed to in processing activities and skill acquired after training sessions.
- Income generation as a result of participating in the project.
- Household type that is common in the community
- The percentage contribution of women processors and their spouses to their household expenditure.
- The problems women processors faced with in their various processing enterprise and their causes and consequences. (Problem tree analysis focusing upon the problems reported by the group was conducted).
- The impact of the project on welfare status

4.5 Validity and reliability of instrument

The instrument for data collection was validated using face validity with the help of experts in Agricultural Extension. The reliability of instrument was tested using the spilt – half method and reliability coefficient of 0.82 was obtained.

4.6 Measurement of variables

Independent variables

The independent variables of this study are:

Socio economic characteristics

1. Age: Respondents were asked to state their actual age in years.
2. Marital status: Respondents were asked to indicate their marital status whether they are single, married, widowed or divorced.
3. Religion: Respondents were asked to indicate their religion from response option of Islam, Christianity and Traditional
4. Educational qualification: Respondents were asked to indicate the actual number of years they spent in formal school.
5. Household size: Respondents were asked to state the actual number of people in their households.
6. Household type: Respondents were asked to indicate whether they are male headed or female headed.
7. Membership of group: Respondents were requested to indicate whether they belong to any of the list of groups provide as Co-operative group, religious group, processors group

market women group, Fadama users group, DELPHE beneficiaries group, National programme for Food Security (NPFS).

8. Position as wife: Respondents were asked to indicate their position as wife as either only, first, second, third, fourth and fifth wives of their husbands.

Enterprise Characteristics.

Respondents were asked to state their enterprise characteristics from the list below:

9. Income generating activities: Respondents were asked to choose from the options that were presented on their primary and secondary income generating activities. These options include processing, trading, farming artisans and any other specified by the respondents.
10. Monthly Income: Respondents were asked to state their actual estimated monthly income in naira from the processed and other products.
11. Processing Activities engaged in: Respondents were asked to state the type of processing activities they engaged in, from the list of options that were provided: Moringa processing, Soybean processing, Cassava processing, and oil palm processing.
12. Processing experience: the processing experience of the processors was taken in years
13. Sources of labour: Respondents were asked to indicate their source (s) of labour choosing from the following options: family labour, hired labour and work exchange group.
14. Land acquisition: Respondents were asked to indicate their methods of land acquisition choosing from the options of Purchased, rented/lease, inheritance.
15. Sources of finance: Respondents were asked to tick their sources of finance from options of: Self, family, friends, cooperative society, and bank.

16. Sources of information on the processing activities: Respondents were asked to indicate their source(s) of information on processing activities from the list of possible sources: Extension agent, friends, radio, television, newspaper, and social group.
17. Level of knowledge on respondents' various processing activities
Respondents' knowledge on various processing activities was measured by asking respondents to respond to a list of ten questions relating to each processing activity. They were asked to pick the correct answers from the list of options. Any wrong answer was assigned zero, while the right answer was assigned one point each. The highest possible score for each processing activity was ten while the lowest score was zero. On the basis of the mean score, respondents were categorized as having high or low score on knowledge of various processing activities.
18. Participation of beneficiaries in activities of DELPHE project
Respondents were asked to indicate their level of participation from the lists of nine project activities presented to them. Respondents were asked to indicate the activities they participated in using a three point rating scale of always, rarely and never. Always was scored two, rarely one and never zero. The maximum score was 18 while the minimum score was 0. The mean score was used to categorize those above the mean as having high level of participation and those below the mean as low participation.
19. Benefits derived by beneficiaries from DELPHE and other interventions
Respondents were asked to indicate the various benefits they derived from the list of eight items provided, using three point rating scale of to a large extent, to a lesser extent, and not at all. These were assigned the score two, one and zero respectively. The maximum scored obtained was 16 while the minimum score was 0. On the basis of the

mean score, respondents were categorized as having benefitted or not benefitted from the project.

20. Attitude of the beneficiaries towards the project

Attitude of respondents towards the project was measured by presenting to the respondents eighteen attitudinal statements on the project. One half of the statements were positively worded, while the other half were negatively worded. The respondents were asked to respond appropriately to the statements using a five point rating scale of Strongly Disagreed (SD), Disagreed (D), Undecided (U), Agreed (A), and Strongly Agreed (SA). These were scored 5, 4,3,2,1 for all positive worded statements and reverse order for all negatively worded statements. The highest possible score was 90; while the lowest possible score was 18. The mean score was used to categorize those above mean as favourable and those below the mean as unfavourable.

21. Constraints faced by respondents on various processing activities:

Constraints on various processing activities were measured by presenting to the respondents, an array of possible constraints on various processing activities. These constraints include high cost of processing machines, lack of credit facilities, lack of technical know-how, unavailability of land for processing activities, unavailability of market for processed products, and lack of good storage facilities. The respondents were asked to indicate the constraints they faced and the severity of the constraint. They were presented with three-point scale of severe, mild and not a severe. These were scored 2, 1, and 0 respectively. The mean was computed and ranked according to the order of severity, from the most severe to not a constraint.

22. Socio-Economic Status (SES) of beneficiaries: Socio economic status of the respondents was measured by asking the respondents to indicate the number of material possessed before and after DELPHE project. The mean score was then used to categorised the SES before and after the project.

23. **Dependent variable**

The dependent variable of the study is the welfare status of the respondents which was measured by asking the respondents to state the actual amount they spend on households' basic items (such as food purchases, school fees, accommodation, utility bills, health etc.) within periods. The expenses were converted into monthly estimations. Thereafter, per capita expenditure was derived by dividing the respondents' household expenditure by the household sizes. The welfare categories were determined using National Bureau of Statistics (NBS, 2005) method. The highest Per Capita Expenditure (PCE) score was ₦16,500.00 while the lowest score was ₦750.00. The mean Per Capita Expenditures was derived as ₦5837.14. The categorisation of the PCE was done using the following criteria;

Between the least value and below $\frac{2}{3}$ of mean PCE = Worse off

Between $\frac{2}{3}$ PCE and the maximum value of PCE = Better off

4.7 Data analysis

Descriptive and inferential statistics were used to analyse the data. Descriptive statistics include mean, frequency and percentage distribution. Inferential statistics used were Chi-square, Pearson Product Moment Correlation (PPMC), t-test and ANOVA.

The Kernel Propensity Score Matching was used to identify the treated group

$$ATT = \frac{1}{N^T} \sum_{I \in T} (Y_I^T - \sum_{J \in C} Y_J^C K \left(\frac{e_I(x) - e_J(x)}{h_n} \right)) / \sum_{K \in C} K \left(\frac{e_K(x) - e_J(x)}{h_n} \right)$$

Where $e_j(x)$ denotes the propensity score of case j in the control group and $e_I(x)$ denotes the propensity score of case I in the treated group and $e_I(x) - e_J(x)$ represents the distance of the propensity scores.

Multiple linear regressions was used to ascertain the contributions of independent variables such as years of education, years of processing activities, occupation income, constraints, household size and benefit derived index of DELPHE programme and other intervention programmes (Fadama programme and National programme for Food Security) to welfare status of the respondents. The model is expressed as:

$$Y = a + \beta x_1 + \beta x_2 + \beta x_3 + \dots + \beta x_9 + u$$

Where Y = per capital expenditure

a = Constant

u = error term

X_1 = Years of education

X_2 = Years of processing experience

X_3 = Household size

X_4 = Occupation

X_5 = benefit derived index of DELPHE programme

X_6 = benefit derived index Fadama programme

X_7 = benefit derived index NPFS programme

X_8 = Constraints

X_9 = Income

4.8 Test of hypotheses

The hypotheses were tested as follows:

Hypothesis 1: Chi square, PPMC

Hypothesis 2: PPMC

Hypothesis 3: PPMC

Hypothesis 4: PPMC

Hypothesis 5: ANOVA

Hypothesis 6 and 7: t-test

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RESULTS AND DISCUSSION

This chapter presents the results of data collected for the study. It is divided into sub-sections which include, descriptive results of Focus Group Discussion (FGD), socio-economic characteristics of respondents, enterprise characteristics of respondents, level of knowledge on respondents' various processing activities, respondents' participation in DELPHE project activities, benefits derived from the project, attitude of the beneficiaries towards the project, constraints faced by the respondents in processing activities, the welfare status of the respondents and results of tested hypotheses.

5.1 Socioeconomic characteristics of respondents**5.1.1 Age**

Age distribution of respondents as presented in Figure 5.1 shows that 58.3% of the beneficiaries were within the age range of 41- 50 years with a mean age of 43.9 ± 12 years while 57.0% of the non beneficiaries were within the age range of 41-50 years with the mean age 42.3 ± 10 years. These age groups are within the productive age. This implies that majority of the respondents were in their economically active age, which means that their active participation in processing activities will bring about higher income for their improved welfare status. Mafimisebi (2007) asserted that most rural women in these economically productive age groups undertake various livelihood activities in their communities.

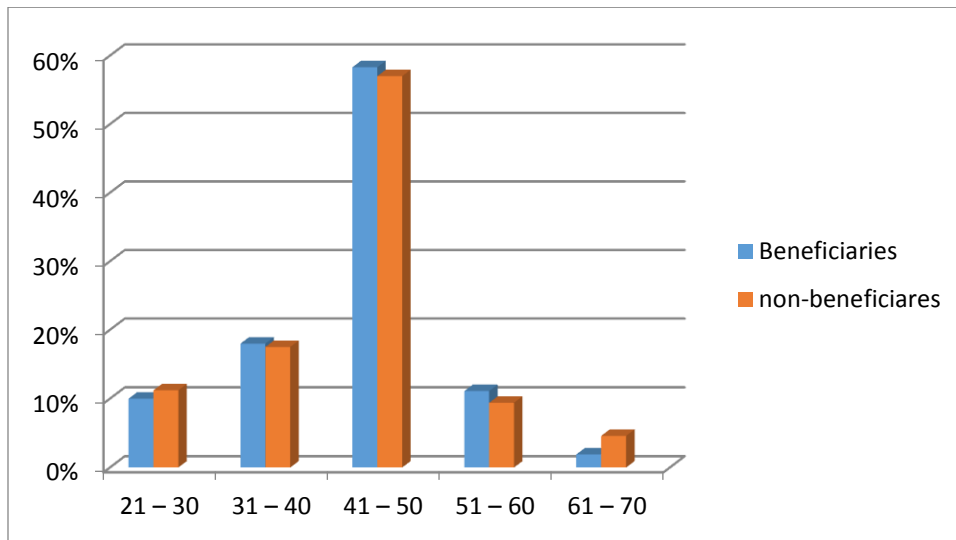


Figure 5.1: Distribution of respondents based on their age group

5.1.2 Marital status

Marital status as indicated in Figure 5.2 shows that 87.0% of non-beneficiaries and 86.0% of the beneficiaries were married respectively, while 13.0% and 13.8% of non beneficiaries and beneficiaries were not married. The high percentage of married people is an indication that the respondents enjoy supports from their spouses and their children. This is in consonance with the findings of Hardie and Lucas (2010) that married couples enjoys family harmony as a result of better welfare status.

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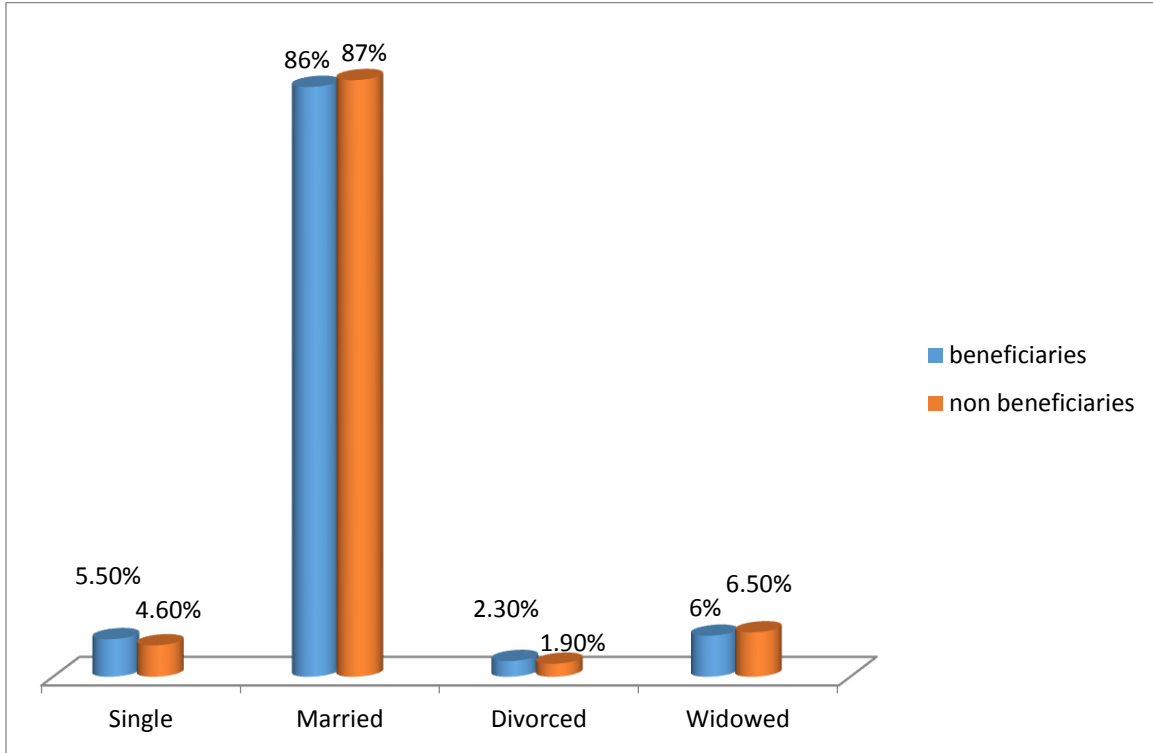


Figure 5.2: Distribution of respondents based on their marital status

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5.1.3 Religion

The results in Figures 5.3 and 5.4 shows that 58.3%, 39.4% and 2.3% of the beneficiaries were Christians, Muslims and traditional worshipers respectively while 56.0%, 38.0%, and 4.0% of the non beneficiaries were also Christians, Muslims and Traditional worshipers respectively. This shows that Christianity is prevalent in the study area. Akinola (2010) reported that most of the respondents in the study are actively involved in religious activities which give them peace of mind in participating in DELPHE project.

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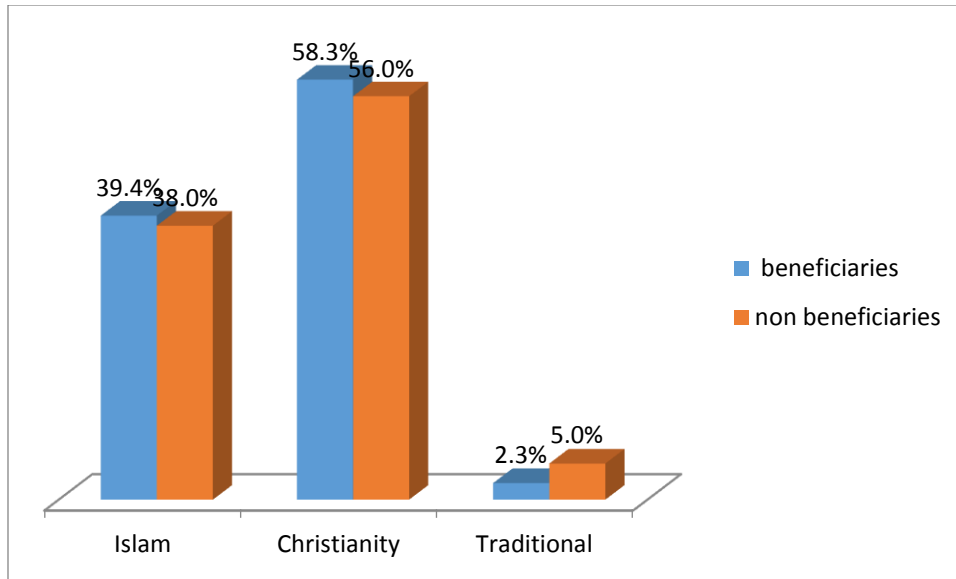


Figure 5.3: Distribution of beneficiaries and non-beneficiaries based on their religion

5.1.4 Educational status

Findings on Table 5.1 reveals that large proportion of beneficiaries (57.2%) and non beneficiaries (55.7%) had primary education, 33.9% non-beneficiaries and 29.4% beneficiaries had no formal education, 10.0% beneficiaries and 9.0% had vocational education, 3.4% beneficiaries and 3.0% of non beneficiaries had adult education while none of the respondents had secondary and tertiary education. This implies that the educational level of respondents is relatively low. This could have influence on the ability of respondents to take advantage of training in order to acquire new skill and knowledge from the project for expansion of their processing enterprise which brings about more income and better welfare status. This is consistent with the findings of Hussain (2013), that respondents' higher educational status is expected to influence positive growth and development in their community.

Table 5.1: Distribution of respondents on their educational status (n₁=216, n₂=88)

Educational Status	n ₁ = Beneficiaries		n ₂ =Non Beneficiaries	
	Frequency	%	Frequency	%
No formal education	64	29.4	30	33.9
Adult education	7	3.4	3	3.0
Vocational education	22	10.0	8	9
Primary	123	57.2	47	55.7
Secondary	0	0	0	0
Tertiary	0	0	0	0
Total	216	100	88	100

Source: Field Survey, 2014

5.1.5 Household Size

Results from Figure 5.4 shows that 51.0% of the beneficiaries had a household size of 5-8 persons with a mean household size of 6.0 ± 2.0 while 53.2% of the non beneficiaries had a household size of 5-8 but with the mean of 6.0 ± 2.0 members. High number of people in a household is likely to exert pressure on the household expenditure and consumption which may have negative effect on their welfare status. Household size is one of the factors that determine the welfare status of the respondents as asserted by Olawuyi and Adetunji (2013) in their study on assessment of rural household poverty in Nigeria, that poverty is high among rural household with large household size. The implication is that the DELPHE beneficiaries are able to cope with higher per capita expenditure on their household size as a result of better welfare status.

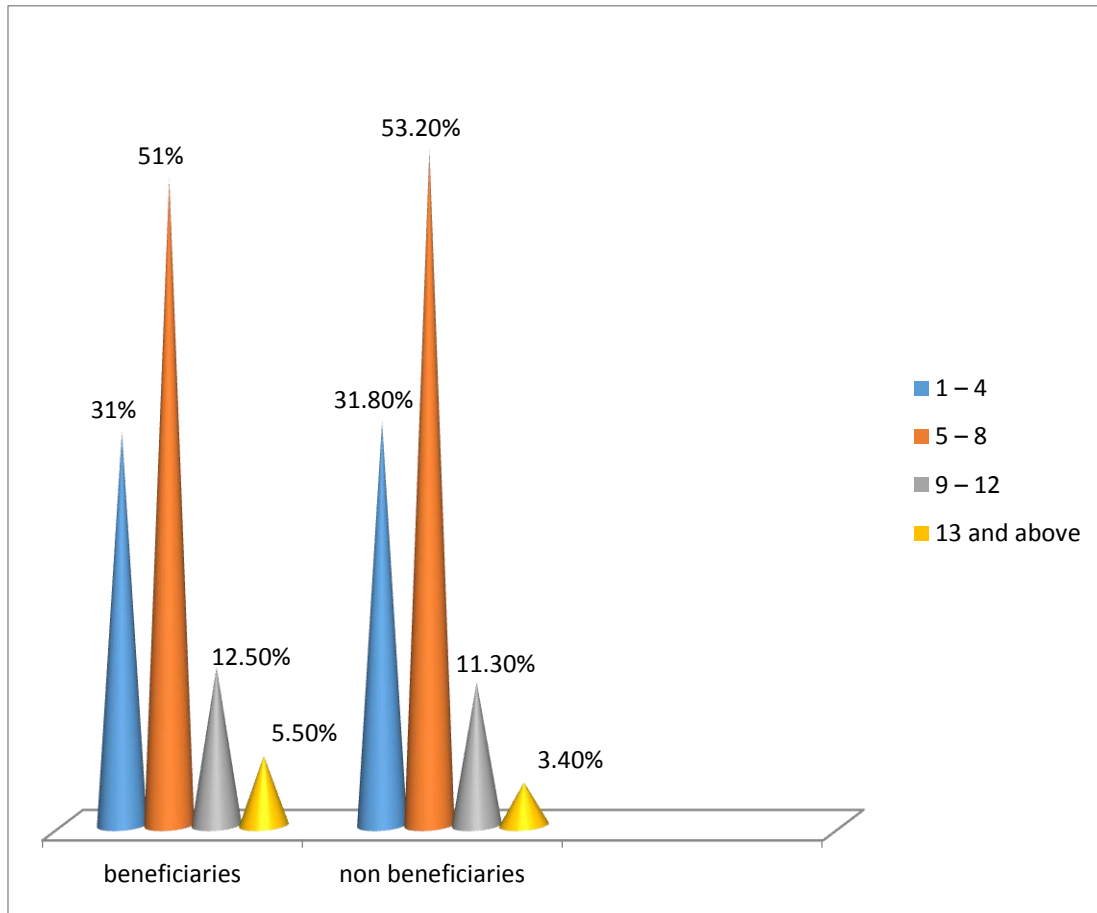


Figure 5.4: Distribution of respondents based on household size

5.1.6 Household head

The findings in Figure 5.5 reveal that majority (81.1%) of beneficiaries and 82.0% of non beneficiaries' households were headed by male while only 18.9% of beneficiaries and 18.0% of the non beneficiaries were headed by female. It can be inferred that most rural household are male headed and this is because of the cultural values that exist in the rural areas. This is corroborated by the findings of Sakataka and Namisiko (2015), who reported that most rural households are male-headed due to the cultural values that exist in rural communities. It can be inferred that most of DELPHE beneficiaries are not household-heads.

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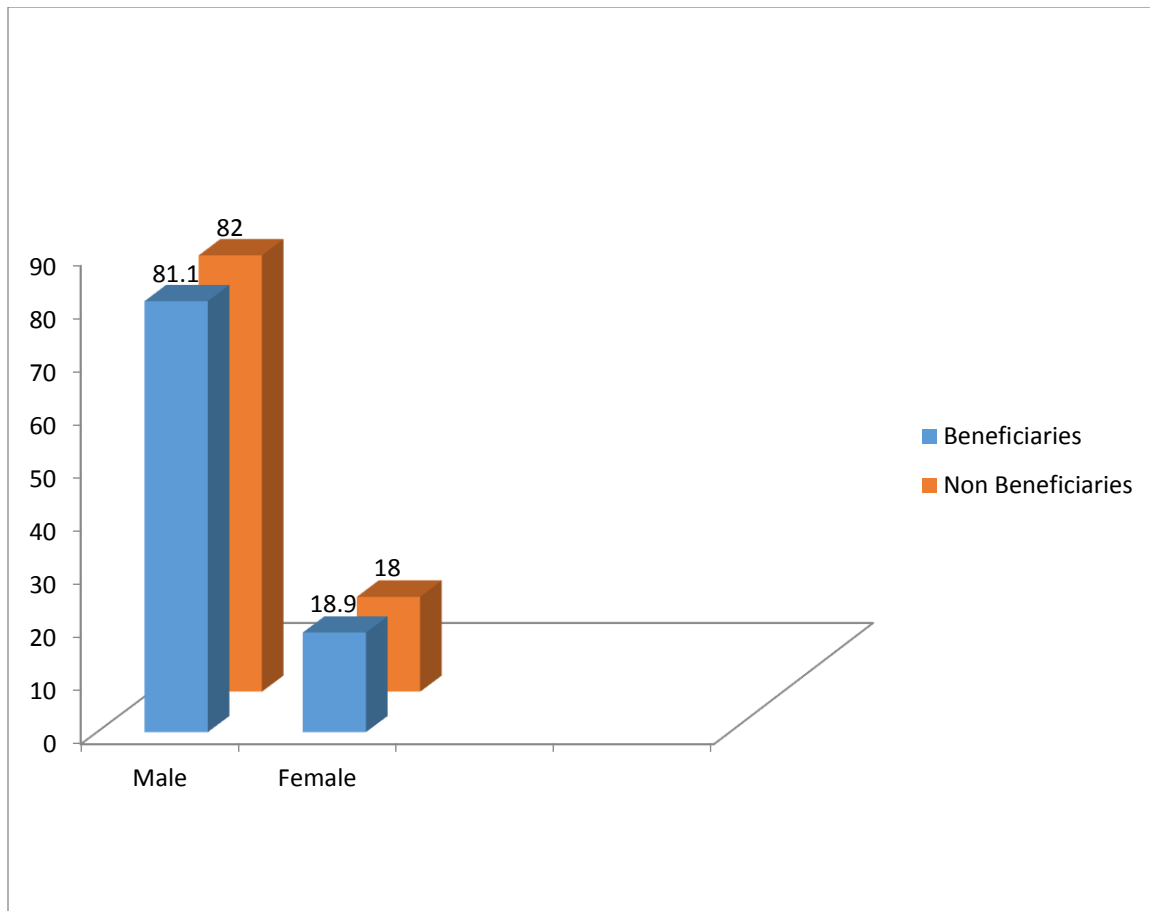


Figure 5.5: Distribution of respondents on the type of household head

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5.1.7 Membership of groups

The result of analysis as presented in Table 5.2 revealed that respondents belong to different groups in the study area. All of the beneficiaries (100.0%) belong to the DELPHE beneficiaries group while non beneficiaries (0.0%) were not members of this group. Majority of the beneficiaries (78.3%) and non beneficiaries (77.2%) were member of religious group. Thirty seven percent of the beneficiaries and 38.2% of the non beneficiaries belong to Fadama users group, 34.3% of beneficiaries and 33.1% of the non beneficiaries were members of processor group, while 30.5% of beneficiaries and 30.0% of the non beneficiaries belong to market women group and National programme for Food Security (NPFS) groups respectively. Membership of associations and groups (social capital) in rural area enhance people's access to resources and credit facilities, thereby contributing to household's welfare. This finding is consistent with Nguigi and Kariuki (2009) that membership of groups in the rural areas enhances people access to resources and credit facilities, thereby contributing to households' welfare. This implies that belonging to groups provide good background for the beneficiaries to became effective members of DELPHE.

Table 5.2: Distribution of respondents by membership of groups* (n₁= 216, n₂= 88)

Membership of groups	n ₁ =Beneficiaries		n ₂ =Non beneficiaries	
	F	%	F	%
Co-operative group	103	47.7	*38	45.2
Religious group	169	78.3	*68	77.2
Processors group	74	34.3	29	33.1
Market women group	66	30.5	26	30.0
Fadama users group	80	37.0	34	38.2
DELPHE beneficiaries group	216	100.0	0	00.0
NPFS group	66	30.5	26	30,0

*Multiple responses

Source: Field Survey, 2014

5.1.8 Position as wife

The results in Figure 5.6 reveals that 23.6% of beneficiaries and 28.4% of the non – beneficiaries were the only wives of their husbands while 44.0% beneficiaries, 38.6 % non- beneficiaries, 14.8% beneficiaries,19.3% non-beneficiaries, 9.3% beneficiaries, 8.0% non- beneficiaries and 8.3% beneficiaries, 5.7% non – beneficiaries were 2nd, 3rd, 4th, and 5th wives of their husbands respectively. This is because polygamy marriage is common in rural communities due to socio-cultural value attached to it. This is in agreement with the findings of Charsley and Liversage (2012), they reported that polygamous marriage is a common practice in the rural areas. The more the wives, the more they share the family resources of their husbands and this bring about the wives solely care for their wards. This could lead to low welfare status of women.

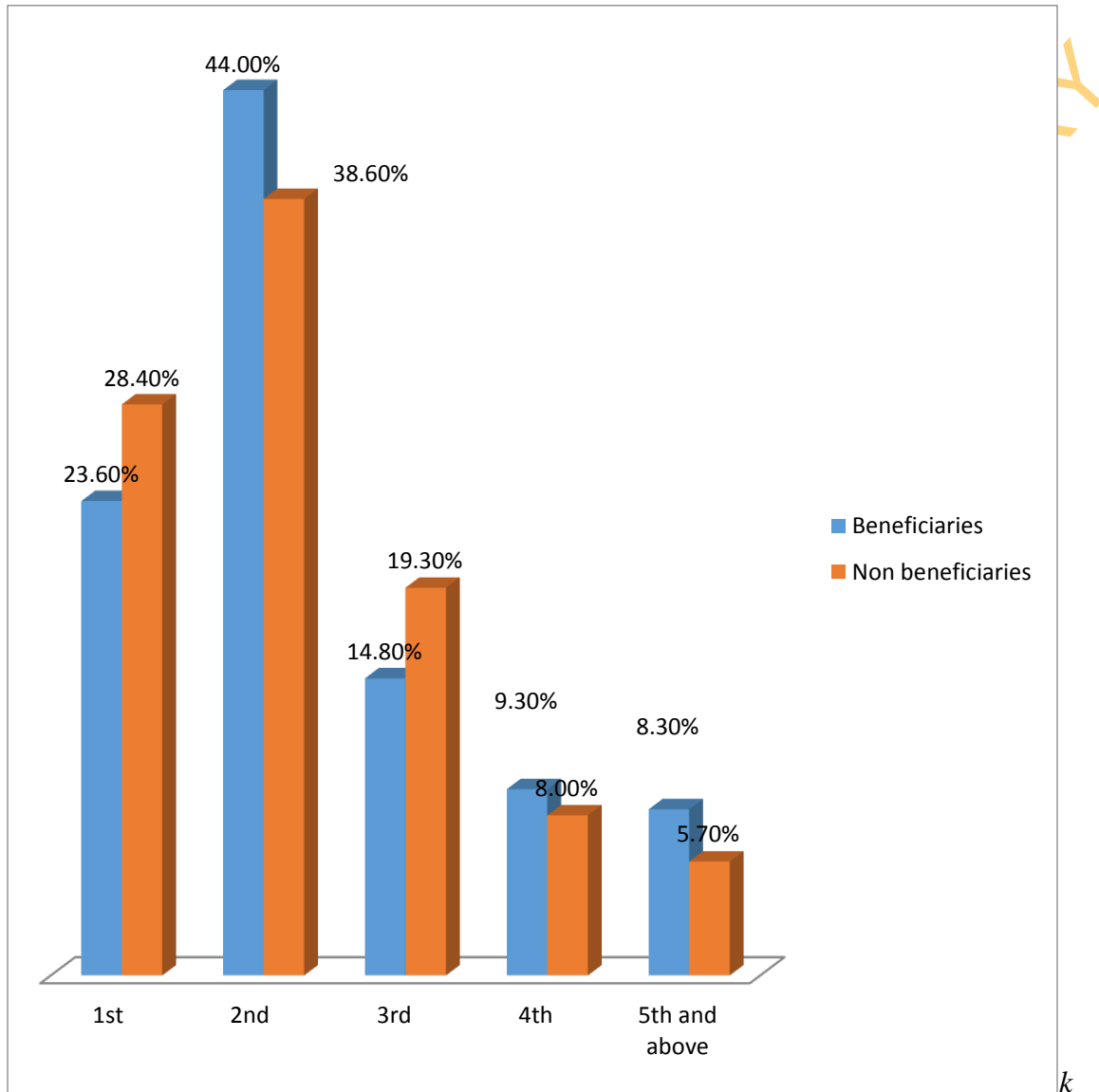


Figure 5.6: Distribution of respondents based on position as wife

5.1.9 Income generating activities

The result of the analysis on Table 5.3 shows that majority of the beneficiaries (83.0%) and non beneficiaries (72.0%) were engaged in processing as their primary occupation, while trading (9.0% beneficiaries and 11.3% non- beneficiaries), farming (6.0% beneficiaries and 10.4% non beneficiaries) and artisan (2.0% beneficiaries and 6.3% non beneficiaries) were the secondary occupation engaged in by the respondents in the study area. The result revealed that processing as a major income generating activities had the highest percentage as their primary occupation. This shows that most rural women engaged in processing of agricultural produce in most developing nations as their primary occupation while they were also involved in other secondary occupation such as trading. This is in accordance with the findings of Mohammed (2014) that most rural women are into processing of agricultural produce and that the respondents engaged in other income generating activities such as trading, farming as their secondary income generating activities. The respondents affirms that engaging in income generating activities by participating in DELPHE project activities gives them rest of mind by using the income generated to care for their children.

Table 5.3: Distribution of respondents on their income generating activities (n₁=216, n₂=88)

Income generating activities	n ₁ = Beneficiaries		n ₂ =Non- beneficiaries	
	F	%	F	%
Primary occupation				
Processing	179	83.0	63	72.0
Secondary occupation				
Trading	20	9.0	10	11.3
Farming	13	6.0	9	10.4
Artisan	4	2.0	6	6.3

Source: Field Survey, 2014

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5.1.10 Monthly income on processed products

The distribution of respondents according to their monthly income is presented on Table 5.4, it revealed that 89.0% of the Moringa beneficiaries processors, 80.0% soybean beneficiaries processors, 81.1% cassava beneficiaries processors, and 73.7% of the oil-palm beneficiaries processors realised ₦31,000 and above monthly, while the 52.0% of the cassava non beneficiaries processors, 53.1% of the oil-palm beneficiaries, 20.0% of the soybean non-beneficiaries, and 18.7% of the Moringa non- beneficiaries processors also realised ₦31,000 and above monthly. This implies more of the beneficiaries' processors generated more monthly income than the non-beneficiaries processors. Respondents generating higher income can afford basic necessity of life and meet households' needs for improved welfare status. This is in-line with Adu-Okoree (2012), who reported that beneficiaries of a programme generate more income than non beneficiaries and are able to contribute to their household basic item expenses such as education, health care services, and bills on utilities

Table 5.4: Distribution of respondents by their monthly income (n₁=216, n₂=88)

Monthly income on processed products	n ₁ =Beneficiaries		n ₂ =Non – beneficiaries	
	F	%	F	%
Moringa processed products				
<₦10,000	1	2.2	4	18.7
₦10,000 – ₦ 20,000	2	4.4	9	42.0
₦21,000 - ₦ 30,000	2	4.4	4	18.7
₦31,000 - ₦40,000	41	89.0	4	18.7
Total	46	100	21	100
Soybean processed products				
<#10,000	1	3.3	3	30.0
₦10,000 – ₦ 20,000	2	6.7	4	40.0
₦20,000 - ₦ 30,000	3	10.0	1	10.0
₦31,000 - ₦ 40,000	24	80.0	2	20.0
Total	30	100	10	100
Cassava processed products				
<₦10,000	1	1.6	1	4.0
₦10,000 – ₦ 20,000	4	6.4	2	8.0
₦20,000 - ₦ 30,000	7	10.9	9	36.0
₦31,000 - ₦ 40000	52	81.1	13	52.0
Total	64	100	25	100
Oil-palm processed products				
<₦10,000	5	6.6	3	9.4
₦10,000 – ₦ 20,000	7	9.2	4	12.5
₦20,000 - ₦30,000	8	10.5	8	25.0
₦31,000 - ₦ 40000	56	73.7	17	53.1
Total	76	100	32	100

Source: Field Survey, 2014

5.2 Enterprise characteristics of respondents

5.2.1 Processing activities engaged in

Result of analysis on Table 5.5 shows that 35.0% beneficiaries, and 36.3% non-beneficiaries were into Cassava processing, 30.0% beneficiaries and 28.4% of non-beneficiaries engaged in Oil palm processing, 21.0% beneficiaries, 24.6% non-beneficiaries were into Moringa processing while 14.0% beneficiaries and 11.3% non beneficiaries were into Soybean processing. It can be deduced that the respondents were into four categories of processing activities. This might be because sample population were drawn across the four processing categories.

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Table 5.5: Distribution of respondents on their processing activities (n₁=216, n₂=88)

Processing activities	n₁=Beneficiaries		n₂=Non- beneficiaries	
	F	%	F	%
Cassava	76	35.0	32	36.3
Oil palm	64	30.0	25	28.4
Moringa	46	21.0	21	24.0
Soybean	30	14.0	10	11.3

Source: Field Survey, 2014

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5.2.2 Processing experience (years)

The result of the respondents' processing experience as shown on the Table 5.6 revealed that 50.8% beneficiaries and 47.0% of the non beneficiaries have been processing for at least 10years. This implies that most of the processors were experienced, which can influence increase in knowledge acquisition during the project training programme. This is consistent with the findings of Adegboye and Otuagoma (2015), that since most of the processors' were experienced, it is easier for them to detect any change brought into their business by the project.

5.2.3 Land acquisition

From Table 5.6, results on land acquisition shows that 50.0% beneficiaries and 45.0% non beneficiaries acquired their land through inheritance, 40.0% beneficiaries and 40.0% non-beneficiaries acquired their land through rent or lease, 10.0% beneficiaries and 15.0% non-beneficiaries through purchase and no land was acquired through the government by the respondents in the study area. The problem of women not having access to land for production may hinder the respondents to expand their processing enterprises and this could have negative influence on their welfare status. Mabunda *et al* (2014) in a similar study asserted that women on their own do not have access to resources but only access land through males.

5.2.4 Sources of labour

The result in Table 5.6 shows that 56.0% beneficiaries and 40.0% non-beneficiaries engaged the use of their children as family labour, 30.0% beneficiaries and 35.0% non-beneficiaries engaged the use of hired labour, 14.0% beneficiaries and 25.0% non-beneficiaries engaged the services of work exchange group. The implication of this is that the use of family labour will reduce labour cost translating to lower cost of production. The finding also highlights that of Darpreix *et.al* (2014) where family labour is found to substitute wage labour.

5.2.5 Sources of finance

Result of analysis as revealed in Table 5.6 shows that 51.0% beneficiaries and 46.0% non-beneficiaries had their sources of finance from personal savings, 30.0% beneficiaries and 35.0% non-beneficiaries sourced for money through co-operative societies, 6.0% beneficiaries and 12.0% non-beneficiaries got money from *Esusu*, 10.0% of the beneficiaries received money from revolving loan scheme, while only 2.0% beneficiaries and 4.0% non-beneficiaries had their sources of finance from bank loans while 1.0% beneficiaries and 3.0% non-beneficiaries had their sources from family and friends. This is an indication that rural women have low access to bank loan for enterprise expansion which in turn brings about more income, this may probably because they do not have collateral to secure the bank loan. A study by Ayeni- Agbaje and Osho (2015) showed that women into small scale enterprises do not possess collateral for securing bank loans.

5.2.6 Sources of information

The result in Table 5.6 further shows that 58.0% beneficiaries and 40% non-beneficiaries got information from social groups, 32.0% beneficiaries and 40.0% non-beneficiaries, received information from radio, 5% beneficiaries and 8.0% non-beneficiaries from family and friends while 3.0% beneficiaries and 5.0% non-beneficiaries received their information from television while only 2.0% beneficiaries and 5.0% non-beneficiaries got their information from newspapers. The higher percentage from getting information from social groups is effective way in information dissemination.

Table 5.6: Distribution of respondents on their enterprise characteristics (n₁=216, n₂=88)

Variables	n ₁ =Beneficiaries		n ₂ =Non –Beneficiaries	
	F	%	F	%
Processing Experience (years)				
1 - 10	110	50.8	41	47.0
11- 20	55	25.5	20	22.0
21 – 30	27	12.5	13	15.0
31 – 40	12	5.6	7	8.0
>40	12	5.6	7	8.0
Total	216	100	88	100
Land acquisition	21	10.0	13	15.0
Purchase	87	40.0	35	40.0
Rent/lease	108	50.0	40	45.0
Inheritance	216	100	88	100
Total	65	30.0	31	35.0
Source of labour	121	56.0	35	40.0
Hired labour	30	14.0	22	25.0
Family labour	216	100	88	100
Work exchange group				
Total	110	51.0	40	46.0
Sources of Finance	65	30.0	30	35.0
Personal savings	13	6.0	11	12.0
Co-operatives	22	10.0	0	0.0
Esusu	4	2.0	4	4.0
Revolving loan	2	1.0	3	3.0
Bank loan	216	100	88	100
Family and Friends				
Total	12	5.0	7	8.0
Source of information	125	58.0	38	42.0
Family and friends	6	3.0	4	5.0
Social group	4	2.0	4	5.0
Television	69	32.0	35	40.0
Newspaper	216	100	88	100
Radio				
Total				

Source: Field survey, 2014

5.3 Respondents' knowledge on various processing enterprise activities

Result of analysis on Table 5.7 shows that majority (76.4%) of the beneficiaries knew that *Moringa oleifera* can be planted with seeds and seedling while 64.8% of the non-beneficiaries do not know, 77.3% of the beneficiaries incorrectly answered that leaves of moringa plant cannot be eaten raw while 55.7% of the non-beneficiaries incorrectly responded. Majority (83.0%) of the beneficiaries response correctly that *Moringa oleifera* seeds germinates within 5-6days while 75.0% of the non-beneficiaries incorrectly response to the question asked, 75.0% of the beneficiaries do not know that processed moringa powder cannot be stored in air-tight container likewise 58.0% of the non-beneficiaries do not know. Moreso, majority (92.0%) of the beneficiaries knew that *Moringa oleifera* leaves can be processed into powder with dryer while 55.7% of the non-beneficiaries do not know. Eighty percent of the beneficiaries incorrectly responded that seeds part of *Moringa oleifera* cannot be processed into oil while 68.2% of the non-beneficiaries answered correctly to the question asked, 76.4% of the beneficiaries correctly response that drying is one of the steps involved in processing moringa into powder while 55.7% of the non-beneficiaries do not know. 90.0% of the beneficiaries do not respond correctly to the question asked that *Moringa oleifera* cannot be processed into moringa tea while 79.5% of the non-beneficiaries do not know. Seventy five percent of the beneficiaries knew that seeds of moringa can be processed into oil while 87.5% of the non-beneficiaries knew, 82.0% of the beneficiaries incorrectly responded that *Moringa oleifera* is not a medicinal plant while 77.3% of the non-beneficiaries correctly responded.

Table 5.8 reveals that majority (90.7%) of the beneficiaries correctly response that soybean cannot be added to other staple crops such as cowpea and cassava while 80.0% of the non-beneficiaries responded correctly. Beneficiaries (87.5%), incorrectly responded that soybean

moi-moi consists of soybean and soy-milk while 50% of the non-beneficiaries incorrectly responded to the question asked. Moreso, 86.1% of the beneficiaries incorrectly responded that milk cannot be extracted in soybean to produce milk while 60.0% of the non-beneficiaries responded correctly. About 90.7% of the beneficiaries do not respond correctly to the question that soybean cannot be processed into various products such as soymilk and cheese while 60.0% of the non-beneficiaries responded incorrectly. Most of the beneficiaries (87.5%) responded correctly that de-hauling is one of the processing steps in producing soy flour while 60.0% of the non-beneficiaries responded incorrectly, 87.0% of the beneficiaries incorrectly responded that grating is not a step involved in soymilk processing while 70.0% of the non-beneficiaries responded correctly. Most of the beneficiaries (87.5%) incorrectly answered that overheating is the processing method that improves soybean nutrient while 60.0% of the non-beneficiaries responded incorrectly. About 87.5% of the beneficiaries correctly responded that soy flour can be added to wheat flour for soy cake production while 70.0% of the non-beneficiaries responded incorrectly. Beneficiaries (87.5%) knew that soymilk should be stored under room temperature while 80.0% of the non-beneficiaries answered incorrectly. Majority of beneficiaries (97.0%) responded correctly that soybean processing should be carried out under good hygienic condition.

Result on Table 5.9 shows that majority (77.4%) of the beneficiaries knew that one of the steps in which oil palm can be processed is by cooking the palm fruit while 76.0% of the non-beneficiaries responded incorrectly. About 77.3% of the beneficiaries correctly responded that one of the steps in processing operations that differentiate the hard and soft oil is fermentation while 79.5% of the non-beneficiaries responded incorrectly. Most (87.0%) of the beneficiaries incorrectly answered that frying is a processing operation in palm oil processing and 83.0% of

the non-beneficiaries responded incorrectly. Of all the beneficiaries, 77.3% of the beneficiaries knew that separation of palm fruit from the bunch is the first stage of processing while 78.4% of the non-beneficiaries responded correctly. Most of the beneficiaries (79.0%) correctly responded that long and short processes are method of extracting oil palm while 85.2% of the non-beneficiaries responded incorrectly. 77.3% of the beneficiaries knew that the last stage of palm oil processing is oil clarification while 76.2% of the non-beneficiaries do not know. About 74.5% of the beneficiaries do not know that soft oil yield is very low while 73.9% of the non-beneficiaries correctly responded, 77.3% of the beneficiaries correctly responded that extraction or pressing of oil can be done in two ways while 83.0% of non-beneficiaries responded incorrectly. Most of the beneficiaries (74.5%) of the beneficiaries responded incorrectly that palm oil is not gotten from palm fruit while 83.0% of the non-beneficiaries do not know. 77.3% of the beneficiaries correctly answered that palm oil can be stored in oil drums or kegs while 83.0% of the non-beneficiaries incorrectly responded.

Result of analysis on Table 5.10 shows that majority (57.4%) of the beneficiaries knew that boiling is not involved in cassava processing while 55.0% of the non-beneficiaries do not know. Most of the beneficiaries (72.1%) knew that grating is the next step of processing cassava into garri after washing and peeling the root while 87.5% of the non-beneficiaries do not know. 72.1% of the beneficiaries knew that refrigerators cannot be used in processing cassava while 81.8% of the non-beneficiaries do not know. Also, beneficiaries (68.2%) correctly responded that dewatering steps in cassava processing helps to improve shelf life while 68.0% of the non-beneficiaries responded incorrectly. About 72.7% of the beneficiaries incorrectly responded that increase in moisture content improve the shelf life of the processed product while 79.5% of the non-beneficiaries responded correctly. 70.8% of the beneficiaries knew that

fermentation is necessary step in cassava processing while 55.0% of the non-beneficiaries do not know. 72.7% of the beneficiaries knew that fermentation helps to get rid of cyanide while 54.0% of the non-beneficiaries do not know. Of all the cassava beneficiaries, 74.5% of the beneficiaries knew that sifted cassava flour is best packed in air tight container while 57.7% of the non-beneficiaries do not know, 68.5% of the beneficiaries and 54.4% of the non beneficiaries responded correctly that bakeries is one of the accessible market for cassava flour. About 60.0% of the beneficiaries and 70.0% knew that cyanide is a poisonous substance in cassava processed products. It can be concluded that of all the processing categories, moringa processors had more knowledge than others.

5.4 Categorisation of respondents' knowledge on various processing enterprise activities

Categorisation of respondents based on their level of knowledge as indicated in Table 5.11 revealed that the beneficiaries (76.0%) had higher knowledge in Moringa processing activities while none of non-beneficiaries were knowledgeable about Moringa processing activities, beneficiaries (98.6%) of the Cassava processing activities had higher knowledge than the non-beneficiaries (50.0%) with low knowledge of cassava processing activities, beneficiaries of Soybean processing activities (93.3%) were more knowledgeable than the non-beneficiaries (20.0%), beneficiaries of Oil palm processing activities (82.4%) had higher knowledge while none of the non-beneficiaries were knowledgeable of Oil-palm processing activities. Thus, beneficiaries were found more knowledgeable than non-beneficiaries. The probable reason might be that the training aspect of the DELPHE programme had helped them to acquire more knowledge through their participation. The high knowledge of the beneficiaries can be attributed to bottom-up approach method used by the project. This conforms to the findings of Collett and

Gale (2009) that training components of a project help beneficiaries of the project to acquire new skills and knowledge

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Table 5.7: Respondents' response to knowledge statements on Moringa processing enterprise (n₁=46, n₂=21)

Knowledge question	n ₁ =-beneficiaries				n ₂ =Non-beneficiaries			
	Correct		Incorrect		Correct		Incorrect	
	F	%	F	%	F	%	F	%
1. Moringa oleifera can be planted with seeds and seedlings.	35	76.4	11	23.6	7	35.2	14	64.8
2. Leaves of moringa plant cannot be eaten raw	10	22.7	36	77.3	9	44.3	12	55.7
3. Moringa oleifera seeds germinate within 5-6 days	38	83.0	8	17.0	5	25.0	16	75.0
4. Processed moringa powder cannot be stored in air-tight container.	12	25.0	34	75.0	8	42.0	13	58.0
5. <i>Moringa oleifera</i> leaves can be processed into powder with dryer.	42	92.0	4	8.0	9	45.0	12	55.7
6. Seeds part of <i>Moringa oleifera</i> cannot be processed into oil	9	20.0	37	80.0	14	68.2	7	31.8
7. Drying is one of the steps involved in processing moringa into powder.	35	76.4	11	23.6	9	45.0	12	55.7
8. <i>Moringa oleifera</i> cannot be processed into moringa tea.	5	10.0	41	90.0	4	20.5	17	79.5
9. Seeds of moringa can be processed into oil.	34	75.0	12	25.0	18	87.5	3	12.5
10. <i>Moringa oleifera</i> is not a medicinal plant	10	18.0	36	82.0	16	77.3	5	22.7

Source: Field survey, 2014

Table 5.8: Respondents' response to knowledge statements on Soybean processing enterprise (n₁=30, n₂=10)

Knowledge question	n ₁ =beneficiaries				n ₂ =Non-beneficiaries			
	Correct		Incorrect		Correct		Incorrect	
	F	%	F	%	F	%	F	%
1. Soybean cannot be added to other staple crops such as cowpea and cassava	27	90.7	3	9.3	8	80.0	2	20.0
2. Soy moi-moi consists of soybean and soymilk	3	12.5	27	87.5	5	50.0	5	50.0
3. Milk cannot be extracted in soybean to produce milk.	5	13.9	25	86.1	6	60.0	4	40.0
4. Soybean cannot be processed into various products such as soymilk and cheese.	3	9.3	27	90.7	7	70.0	3	30.0
5. De-hauling is one of the processing steps in producing soy flour	27	87.5	3	12.5	4	40.0	6	60.0
6. Grating is not a step involve in soymilk processing	4	13.0	26	87.0	7	70.0	3	30.0
7. Over heating is the processing method that improves soybean nutrient	3	12.5	27	87.5	4	40.0	6	60.0
8. Soy flour can be added to wheat flour for soy cake production	27	87.5	3	12.5	3	30.0	7	70.0
9. Soymilk should be stored under room temperature	27	87.5	3	12.5	2	20.0	8	80.0
10. Soybean processing should be carried out under good hygienic condition.	29	97.0	1	3.0	1	1.00	9	9.0

Source: Field Survey, 2014

Table 5.9: Respondents' response to knowledge statements on Oil palm processing enterprise (n₁=64, n₂=25)

Questions	n ₁ =beneficiaries				n ₂ =Non-beneficiaries			
	Correct		Incorrect		Correct		Incorrect	
	F	%	F	%	F	%	F	%
1. One of the steps in which oil palm can be processed is by cooking the palm fruit.	50	77.4	14	22.7	6	24.0	19	76.0
2. One of the steps in processing operations that differentiate the hard and soft oil is fermentation	50	77.3	14	22.7	5	20.5	20	79.5
3. Frying is a processing operation in palm oil processing	8	13.0	56	87.0	4	17.0	21	83.0
4. Separation of palm fruit from the bunch is the first stage of processing.	50	77.3	14	22.7	20	78.4	5	21.6
5. Long and short processes are method of extracting oil palm	51	79.0	13	21	3	14.8	22	85.2
6. The last stage of palm oil processing is oil clarification	50	77.3	14	22.7	6	23.8	19	76.2
7. Soft oil yield is very low	16	25.5	48	74.5	18	73.9	7	26.1
8. Extraction or pressing of oil can be done in two ways	50	77.3	14	22.7	4	17.0	21	83.0
9. Palm oil is not gotten from palm fruit.	6	9.3	58	74.5	4	17.0	21	83.0
10. Palm oil can be stored in oil drums or kegs	50	77.3	14	22.7	4	17.0	21	83.0

Source: Field Survey, 2014

Table 5.10: Respondents' response to knowledge statements on Cassava processing enterprise (n₁=76, n₂=32)

Questions	n ₁ =-beneficiaries				n ₂ =Non-beneficiaries			
	Correct		Incorrect		Correct		Incorrect	
	F	%	F	%	F	%	F	%
1. Boiling is not involved in cassava processing	44	57.4	32	42.6	14	45.0	18	55.0
2. Grating is the next step of processing cassava into gari after washing and peeling the root	55	72.7	21	27.3	4	12.5	28	87.5
3. Refrigerators cannot be used in processing cassava	55	72.7	21	27.3	6	18.2	28	81.8
4. Dewatering steps in cassava processing helps to improve Shelf life	52	68.2	24	31.5	10	32.0	22	68.0
5. Increase in moisture content improve the shelf life of the processed product	21	27.3	55	72.7	25	79.5	7	20.5
6. Fermentation is necessary step in cassava processing	54	70.8	22	29.2	14	45.0	18	55.0
7. Fermentation helps to get rid of cyanide	55	72.7	21	27.3	15	46.0	17	54.0
8. Sifted cassava flour is best packed in airtight container	57	74.5	19	25.5	13	42.3	19	57.7
9. Bakeries is one of the accessible market for cassava flour	52	68.5	24	31.5	17	54.0	15	46.0
10. Cyanide is a poisonous substance in cassava processed products.	54	60.0	21	39.6	24	74.0	8	26.0

Source: Field Survey, 2014

Table 5.11: Categorisation of respondents on their level of knowledge on various processing enterprise

Enterprise	Score range	Beneficiaries		Non-beneficiaries		Mean	SD
		F	%	F	%		
Moringa						9.57	0.85
low	0 - 9.00	11	24.0	21	100		
High	9.01 - 10.00	35	76.0	0	0		
Total		46	100	21	100		
Soybean						3.19	1.97
Low	0 - 3.18	2	6.7	8	80.0		
High	3.19 -10.00	28	93.3	2	20.0		
Total		30	100	10	100		
Oil palm						9.78	0.50
low	0 – 9.77	11	17.6	25	100		
High	9.78-10.00	53	82.4	0	0		
Total		64	100	25	100		
Cassava						3.50	1.31
Low	0 - 3.49	1	1.4	16	50		
High	3.50 -10.00	75	98.6	16	50		
Total		76	100	32	100		

Source: Field Survey, 2014

5.5 Participation of beneficiaries in DELPHE project activities

The result of findings on Table 5.12 reveals that majority of the respondents always participate in contribution to decision making (0.86), meeting attendance (0.85), participation in training (0.84), regularity of payment of dues (0.83), participation in group formation (0.82) provision of required information at meeting (0.81), while respondents had low participation in obtaining revolving loan (0.63), procurement of processing equipment (0.59) and distribution and handing over of processing equipment (0.55). The high percentage of respondents participation in training is because training ensures being exposed to some new processing practices that is expected to improve their processing skill, which will in turn improve their standard of living, participation in the meeting attendance may be because they are aware of the benefits from the project, thus they are eager and ready to participate in meeting attendance. Obtaining revolving loan is as a result of low business enterprise of women as reported by Dutt (2014) that women had low business enterprise, and their inability to secure bank loan to expand their business enterprise, they have to employ the available means of credit facilities such as revolving loan from their group to expand their business enterprises. Low participation in revolving loan might be because of limited amount of loan available, making it not enough for distribution among the members. Participation in the procurement of processing equipment will assist the beneficiaries to procure processing equipment on their own. Due to the high cost of processing equipment, they are not affordable by the respondents individually, hence the need for cooperation by all group members to purchase the equipment and consequent rotation of the equipment among members for utilisation. Women are known for regularity of dues, they are law abiding and since it is the decision of the whole group that certain due is to be levy on members, it becomes imperative for them to comply. The implementation of project was made possible because it has been observed

by Oniye (2003) that semi illiterate women tends to co-operate among themselves by showing some level of responsibility thereby contributing their quota to the development of the group.

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Table 5.12: Distribution of beneficiaries on the level of participation in DELPHE project activities (n=216)

SN	Participation in DELPHE activities	Always		Rarely		Never		Mean	Rank
		F	%	F	%	F	%		
1.	Participation in group formation	176	81.5	29	13.4	11	5.1	0.82	5 th
2.	Meeting attendance	185	85.6	28	13.0	3	1.4	0.85	2 nd
3.	Regularity of dues payment towards the project	188	87.0	10	4.6	18	8.3	0.83	4 th
4.	Provide required information at meetings	182	84.3	18	8.3	16	7.4	0.81	6 th
5.	Contribution in decision making in DELPHE projects	193	89.4	14	6.5	9	4.2	0.86	1 st
6.	Participation in training of processing activities	187	86.6	20	9.3	9	4.2	0.84	3 rd
7.	Obtaining revolving loan	132	61.1	31	14.4	53	24.5	0.63	7 th
8.	Procurement of processing equipments	119	55.0	37	17.1	67	30.0	0.59	8 th
9.	Distribution / handing over of processing equipment	111	51.0	38	17.6	67	30.0	0.55	9 th

Source: Field survey, 2014

5.5.1 Level of participation of respondents in DELPHE project activities

The result of analysis of the level of participation is revealed in Table 5.13. The participation mean score was 9.16. The mean was used to categorise the respondents into two groups of low and high using the mean score. The result shows that more than half (63.4%) of the beneficiaries had high level of participation while the remaining 36.6% had low level of participation. This is reflected in a response during the FGD as follows:

“My participation in DELPHE project activities had helped to improve my relationship with other people in a group. Also the money given to me as a revolving loan was used to expand my processing business which makes me generate more income”

Based on the findings, it can be concluded that appreciable percentage participated in various activities of the project, which could be attributed to their having basic education. This is corroborated by the study of Nour (2011) that participatory development pointed out that the better educated the members of the community, the higher their participation in development project.

Table 5.13: Categorisation of respondents by participation in DELPHE project activities

Level of participation	Frequency	%	Min	Max	S D	Mean score
Low (0-8)	79	36.6	0.0	18.0	4.92	9.16
High (9-18)	137	63.4				
Total	216	100				

Source: Field Survey, 2014

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5.6 Benefits derived by beneficiaries of DELPHE and other projects

Benefits derived by beneficiaries of DELPHE, project is shown in Table 5.14. The respondents who participated in the intervention programme had significant benefits in skill enhancements, with the benefit from DELPHE project having the mean of 0.84. Also, beneficiaries who participated in DELPHE project had more benefits in terms of increased in yield with a mean of 0.76. Moreso, most of the respondents who participated in DELPHE project had more access to revolving loan with the mean of 0.49. Beneficiaries who participated in DELPHE project benefited more on training empowerment with a mean of 0.78. In addition, majority of the respondents who participated in DELPHE project had their enterprise expanded with a mean of 0.78. Standard of living of majority of the respondents who participated in DELPHE project was improved with a mean of 0.82. Beneficiaries who participated in DELPHE project had more benefits in term of increased in processing equipment with a mean of 0.66. Majority of the respondents who participated in DELPHE project had more self employment opportunity with a mean of 0.78. Also, majority of the respondents who participated in DELPHE project had better use of available resources with a mean of 0.71. It can be concluded that most of the beneficiaries derived more benefits from DELPHE project. This conforms to the findings of Adamu *et al* (2013), they posited that benefits derived from project through community driven approach is centred on the beneficiaries of that project.

Table 5.14: Distribution of beneficiaries on benefits derived from DELPHE project (n=216)

S/No	Benefits derived	To a great extent		To a lesser extent		Not at all		Mean	Rank
		F	%	F	%	F	%		
1.	Skill enhancement	190	88.0	13	6.0	13	6.0	0.84	1 st
2.	Increase in yield	173	80.0	10	5.0	33	15.0	0.76	6 th
3.	Access to revolving loan	97	45.0	33	15.0	86	40.0	0.49	9 th
4.	Training/Empowerment	176	81.5	13	6.0	27	12.5	0.78	3 rd
5.	Enterprise Expansion	175	81.0	16	7.4	25	12.0	0.78	3 rd
6.	Improved standard of living	184	85.2	14	6.5	18	8.0	0.82	2 nd
7.	Increase in processing equipment	137	63.4	35	16.0	44	20.0	0.66	8 th
8.	Self employments opportunity	169	78.2	27	12.5	20	9.0	0.78	3 rd
9.	Better use of available productive resources	153	70.8	24	11.0	39	18.0	0.71	7 th

Source: Field survey, 2014

5.6.1 Level of benefits derived from DELPHE project

The result of benefits derived by the beneficiaries as revealed in Table 5.15 shows that the mean score was 7.12 and this was used to categorise the level of benefit derived into high and low level of benefits derived. The results shows that most of the beneficiaries (65.7%) had high level of benefit while 34, 4% had low level of benefits derived. The high level of benefits by the beneficiaries is corroborated by the result of FGD where a discussant (Cassava processor) stated that:

“I paid money to other owner of cassava grinding machines to grind my cassava roots because i didn't have enough money to purchase one, but now i am a proud owner of cassava grinding machine procured through the DELPHE project. I have indeed benefited a lot from the project”

Implication of this result is that beneficiaries have benefited well in DELPHE project than other intervention programmes they were involved in.

Table 5.15: Categorisation of respondents by benefits derived from DELPHE project activities

Level of benefit	Frequency	percent	Min	Max	S D	Mean score
Low (0-6)	74	34.3	0.0	14.0	4.45	7.12
High (7-14)	142	65.7				
Total	216	100				

Source: Field Survey, 2014

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5.7 Attitude of the beneficiaries towards the DELPHE project

The result as obtained in Table 5.16 shows the beneficiaries response to attitudinal statements towards DELPHE project. The favourable disposition of processors towards the DELPHE project is not in doubt as they responded positively to most of the issues raised. For instance, majority (83.0%) were affirmative that the project was life changing, 81.0% agreed that the project increased their income, this is simply because the beneficiaries have learnt new processing skill better, which help also help to increase their scale of production which in turn increase income. This is in agreement with the findings of Hussain (2013) that beneficiaries have favourable attitude towards a project that increase their income. Also, most of the beneficiaries (78.0%) agreed that the project had helped to improve most of the beneficiaries' network and this possible because through group activities, there is always development of social capital in which they rendered some assistance to one another and also information dissemination through this medium is not left out, while 76.0% confirmed that the training programme of the project was not too demanding. Perhaps, this was reinforced by the conviction of 73.6% of the beneficiaries that the project enhanced the skill of beneficiaries. In all, it can be safely concluded that most beneficiaries are favourably disposed to the DELPHE project. This result is consistent with report of Muhammad *et.al* (2011) on beneficiaries having favourable towards a project.

Table 5.16: Distribution of beneficiaries by attitude towards DELPHE project (n=216)

Statements	SA		A		U		D		SD		Mean
	F	%	F	%	F	%	F	%	F	%	
1. The facilitators' conduct of training activities was not encouraging	1	1.0	11	5.0	28	13.0	36	16.0	140	65.0	2.25
2. The training programme was not too demanding in terms of energy	165	76.0	26	12.0	5	2.0	1	1.0	19	9.0	1.94
3. The project left most of the beneficiaries better	156	72.0	34	16.0	9	4.0	1	1.0	16	7.0	4.45
4. Participation in the project had helped to improve most of the beneficiaries network	169	78.0	23	11.0	7	3.0	1	1.0	16	7.0	4.56
5. Most of DELPHE project activities are waste of time	20	9.0	36	17.0	3	2.0	1	1.0	156	72.0	1.58
6. Identification of members problem was deficient	30	14.0	48	22.0	5	2.3	7	3.2	126	58.3	1.92
7. The DELPHE project enhances the beneficiaries processing skill	159	73.6	28	13.0	4	1.9	2	2.0	23	9.3	4.38
8. It is a life changing project	179	83.0	11	5.0	5	2.3	18	8.3	3	1.4	4.50
9. The DELPHE project had not helped most of the beneficiaries to acquired new knowledge	125	57.9	45	20.8	4	3.0	3	2.1	39	18.0	2.01
10. Participation in the project is too demanding	25	11.6	43	19.9	5	2.3	18	8.3	125	57.9	1.96
11. The project helped beneficiaries to discover new things	161	74.5	15	6.9	4	1.9	10	4.6	35	16.2	4.23
12. The general welfare status of beneficiaries was not improved by the project	117	54.2	50	23.1	4	1.9	1	1.0	35	16.2	2.06
13. Communication was not effective in the execution of the project	98	45.4	70	32.4	6	2.8	5	2.3	37	17.1	2.13
14. Participating in DELPHE project had increased my assets	158	73.0	23	10.6	8	3.7	5	2.7	22	10.2	4.39
15. DELPHE project had not strengthened membership co-operation	50	23.0	56	26.9	3	1.4	7	3.2	100	46.3	2.31
16. The achievement of the project are not visible	3	1.4	5	2.3	53	24.8	4	1.9	112	53.3	1.91
17. The project requires low investment	107	49.5	41	19.0	5	2.3	24	11.0	39	18.0	3.71
18. The project has increase my income	175	81.0	15	6.9	5	2.3	18	8.3	20	9.3	4.47

Source: Field survey, 2014. Grand mean: 3.04

5.7.1 Categorisation of beneficiaries' attitude towards the project

From the result on Table 5.17 which revealed that the attitude of beneficiaries towards the DELPHE project was favourable (56.0%) while 44.0% of the beneficiaries had unfavourable attitude towards the project. The maximum score was 84 while the minimum score was 49 and the mean score of 62.9 ± 6.44 . This implies that beneficiaries had favourable attitude towards the DELPHE project. The Higher percentage of favourable attitude of beneficiaries towards DELPHE project is an indication that the project is successful and the beneficiaries will not hesitate to participate in future. (Innih, and Dimelu 2013).

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Table 5.17: Categorisation of beneficiaries' on their level of attitude towards the project

Level of attitude/Score range	Frequency	Percentage	Minimum	Maximum	Mean	Standard deviation
Unfavourable (49 -62)	95	44.0	49	84	62.90	6.44
Favourable (63- 84)	121	56.0				

Source: Field Survey, 2014

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5.8 Constraints faced by the respondents in various processing activities

Result on Table 5.18 presents the constraints faced by beneficiaries and non-beneficiaries on their various processing activities. It revealed that, high cost of processing equipment was ranked 1st based on their mean by non-beneficiaries (1.68) and lack of credit facilities by beneficiaries (0.60) as the most serious constraint faced by the respondents. Lack of credit facilities was ranked 2nd by non-beneficiaries (1.54) and unstable price of processed products was also ranked 2nd by beneficiaries (0.56), unstable price of processed products was ranked 3rd by non-beneficiaries (1.28) while the beneficiaries (0.46) ranked high cost of processing equipment as the 3rd, lack of technological knowhow was ranked 4th by non-beneficiaries while beneficiaries ranked it 5th (0.33), inadequate storage facilities was ranked 5th by non-beneficiaries (0.91) while beneficiaries ranked it 4th (0.63). Unavailability of land for processing activities was ranked 6th by both non-beneficiaries (0.54) and beneficiaries (0.18). It can be deduced from this finding that the respondents were faced with constraints in their processing activities and which may hinder their processing activities. This is confirmed by Fabiyi *et al.* (2007) that rural women are faced with constraints in their processing activities, and this reduces their productivity, which may bring about poor welfare status

Result of the problem tree analysis shows that the consequences of constraints faced in processing activities were poor storage facilities, reduction in products shelf life, low income from processed products, low contribution to household expenditure and poor welfare status.

Table 5.18: Distribution of respondents on constraints faced by respondents on various processing activities (n₁=216, n₂=88)

S/N	Constraints	n ₁ = Beneficiaries					n ₂ = Non- beneficiaries						
		Severe	Mild	Not	a	Mean	Rank	Severe	Mild	Not	a	Mean	Rank
		%	%	%				%	%	%			
1	Lack of credit facilities	55.1	20.0	25.0		0.60	1 st	53.0	30.2	16.8		1.54	2 nd
2	Unstable price of processed products	51.9	18.0	30.1		0.56	2 nd	43.5	26.0	30.5		1.28	3 rd
3	High cost of processing equipment	41.2	16.5	42.1		0.46	3 rd	60.0	28.0	12.0		1.68	1 st
4	Inadequate storage facilities	27.3	16.0	56.5		0.33	4 th	30.0	20.0	50.5		0.91	5 th
5	Lack of technological know how	25.0	12.3	62.5		0.30	5 th	28.2	15.2	56.6		0.98	4 th
6	Unavailability of land for processing activities	14.0	10.0	75.0		0.18	6 th	18.0	12.0	70.0		0.54	6 th

Source: Field Survey (2014)

Result of Problem Tree Analysis

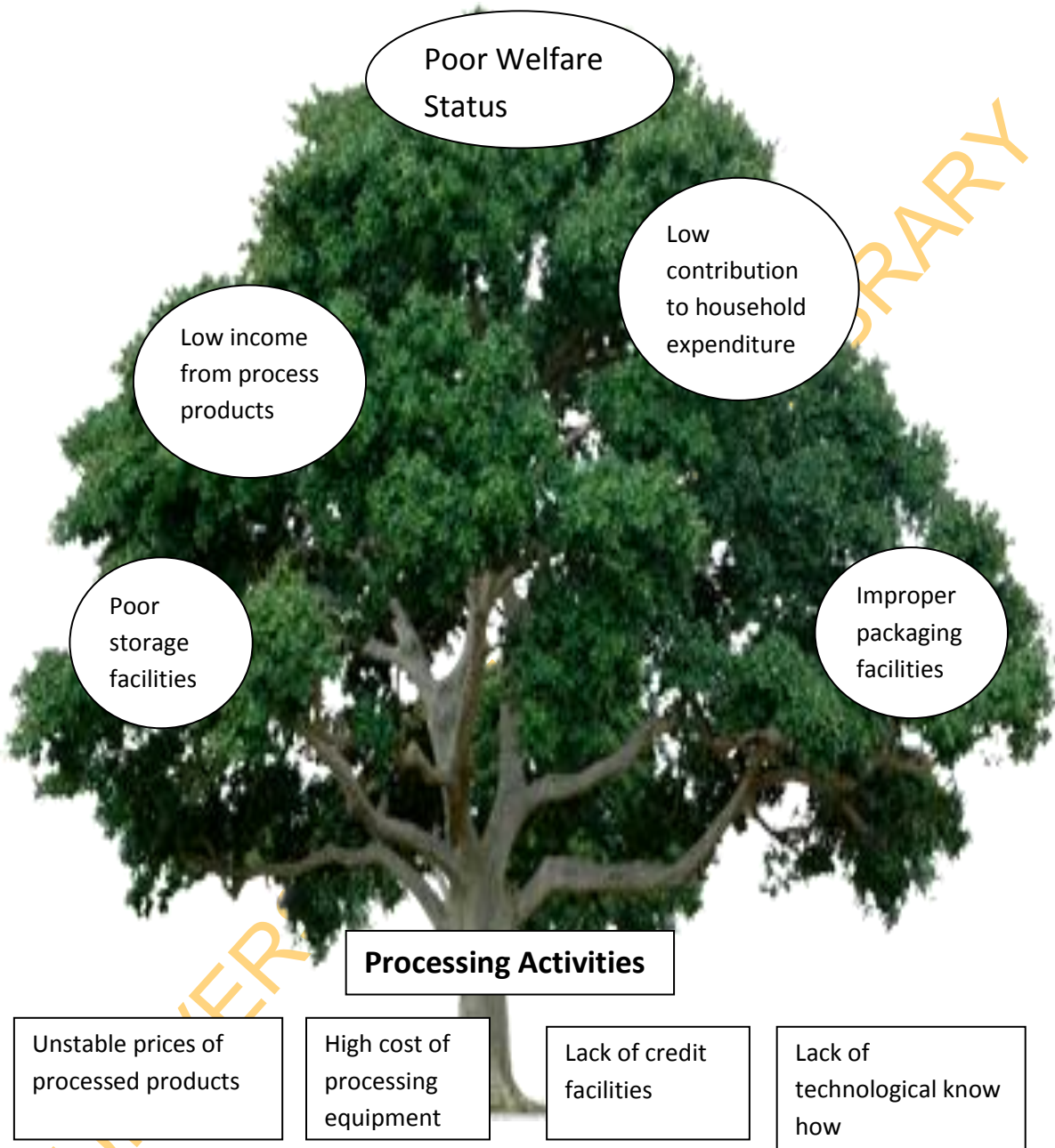


Figure 5.7: Result of Problem Tree Analysis by the respondents on constraints faced on processing activities and the consequences on their processing activities

5.9 Socio-Economic Status (SES) of the respondents

5.9.1 Respondents' possession of socio- economic status indicators

Result on Table 5.19 reveals that majority (54.1%) of the beneficiaries possesses one item of television before DELPHE project but increased to 66.2% after the project. Also, majority (62.1%) of the beneficiaries also possessed one radio item before DELPHE but increased to 72.0% after DELPHE project. Most of the respondents (45.0%) had one cell phone before DELPHE project but increased to 57.0% after DELPHE project. Furthermore, majority (25.4%) of the beneficiaries who possess one umbrella before DELPHE project increases to 56.0% after the project likewise majority (29.0%) of them who possessed one leather shoe/slippers before DELPHE project increased to 56.0% after the project. In addition, majority of the beneficiaries who possessed one dozen of breakable plates before DELPHE project increased to 55.4% after the project. Moreover, most of the beneficiaries (24.0%) who possessed one poultry bird before DELPHE increased to 48.0% after the project likewise majority (25.4%) of the beneficiaries who possessed one sheep and goat before DELPHE project increased to 54.0% after the project. This implies that DELPHE project in the study area had a significant influence on the owned by the respondents.

Table 5.19: Distribution of beneficiaries by possession of socio- economic indicators before and after DELPHE project (n=216)

Socio-economic status indicators	Number of item possessed	Possession before DELPHE		Possession after DELPHE	
		F	%	F	%
Children that has gone through school	0	3	1.4	3	1.4
	1	11	5.1	11	5.1
	2	28	13.0	21	10.0
	3	34	15.7	36	16.4
	>4	140	64.8	145	67.1
Children in tertiary Institution	0	28	13.0	18	8.3
	1	37	17.1	25	12.0
	2	41	19.0	31	14.0
	3	42	19.5	54	25.0
	>4	68	31.4	88	40.0
Ownership of cement house	0	143	66.0	100	46.4
	1	69	32.0	80	37.0
	2	4	2.0	26	12.0
	3	0	0	7	3.2
	>4	0	0	3	1.4
Processing equipment	0	156	72.2	70	32.4
	1	46	21.2	125	58.0
	2	11	5.1	16	7.2
	3	2	1.0	3	1.4
	>4	1	0.5	2	1.0

Table 5.19: Distribution of beneficiaries by possession of socio- economic indicators before and after DELPHE project (con'd) (n=216)

Socio-economic status indicators	Number of item possessed	Possession before DELPHE		Possession after DELPHE	
		F	%	F	%
Television	0	85	39.3	55	25.4
	1	117	54.1	143	66.2
	2	11	5.1	14	6.5
	3	2	1.0	3	1.4
	>4	1	0.5	1	0.5
Radio	0	67	31.0	43	20.0
	1	135	62.1	156	72.0
	2	10	5.0	12	5.5
	3	3	1.4	4	2.0
	>4	1	0.5	1	0.5
Refrigerator	0	156	72.2	122	56.5
	1	46	21.2	66	30.5
	2	11	5.1	24	11.1
	3	2	1.0	3	1.4
	>4	1	0.5	1	0.5
Cell phone	0	71	33.0	33	15.3
	1	97	45.0	123	57.0
	2	34	16.0	52	24.0
	3	9	4.0	5	2.3
	>4	5	2.0	3	1.4
Electric iron	0	127	59.0	54	25.0
	1	50	23.0	118	55.0
	2	29	13.3	26	12.0
	3	8	3.7	10	5.0
	>4	2	1.0	8	3.0
Umbrella	0	127	59.0	52	24.0
	1	55	25.4	121	56.0
	2	16	7.4	18	8.0
	3	10	5.0	15	7.0
	>4	8	3.0	10	5.0
Wristwatch	0	195	90.1	101	47.0
	1	15	7.0	75	35.0
	2	3	1.4	23	10.0
	3	2	1.0	11	5.0
	>4	1	0.5	6	3.0
Jewelleries	0	210	97.1	180	83.3
	1	3	1.4	23	11.0
	2	2	1.0	10	5.0
	3	1	0.5	2	1.0
	>4	0	0.0	1	0.5
Leather shoes / slippers	0	97	45.0	36	17.0
	1	63	29.0	127	56.0
	2	32	15.0	36	17.0
	3	18	8.0	16	7.0
	>4	6	3.0	6	3.0

Table 5.19: Distribution of beneficiaries by possession of socio- economic indicators before and after DELPHE project (con'd) (n=216)

Socio-economic status indicators	Number of item possessed	Possession before DELPHE		Possession after DELPHE	
		F	%	F	%
Breakable plates	0	131	61.0	62	29.0
	1doz	27	12.0	120	55.4
	2doz	36	17.0	20	9.2
	3doz	17	8.0	11	5.0
	>4doz	5	2.0	3	1.4
Cooking pots	0	81	37.5	39	18.0
	1	38	17.5	51	23.6
	2	40	18.5	48	22.2
	3	31	14.3	48	22.2
	>4	26	12.0	30	14.0
Poultry birds	0	60	28.0	21	10.0
	1	52	24.0	103	48.0
	2	50	23.0	35	16.0
	3	34	16.0	21	10.0
	>4	20	9.0	36	16.6
Sheep and goat	0	71	32.8	33	15.0
	1	55	25.4	116	54.0
	2	36	17.0	35	16.0
	3	31	14.1	21	10.0
	4	23	11.0	11	5.0

Source: Field Survey, 2014

5.9.2 Socio Economic Status (SES) of before and after DELPHE project of beneficiaries

The result as indicated on Table 5.20 reveals the mean SES of beneficiaries before the project which is 28.09 while the mean SES after is 64.34. The difference in the mean SES before and after confirmed that the DELPHE project had positive impact on the beneficiaries of the project. This finding is related to the study of Okoruwa *et.al.* (2015) on project improving the welfare status of beneficiaries.

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Table 5.20: Socio-economic status of the DELPHE project beneficiaries

	Mean	Standard deviation	Standard error
SES before	28.09	17.79	1.13
SES after	64.34	42.17	2.68

Source: Data Analysis, 2014

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5.10 Welfare status of the respondents

5.10.1 Monthly household and actual per capita expenditure

The result of findings of revealed the respondents per capital expenditure which is derived by dividing the household expenditure by the household size of the respondents. The result of analysis on Table 5.21 revealed that households of beneficiaries of DELPHE project spent ₦12,091.45 on food purchases while the households of non beneficiaries spent ₦1,607.28 monthly, households of beneficiaries in a month spent ₦27,688.53 on education, while household of non-beneficiaries spent ₦4,826.86, household of beneficiaries spent ₦1,216.00 on health while household of non beneficiaries spent ₦994.13 monthly. The expense incurred on clothing in a month by households of beneficiaries is ₦2725.59 while households of non beneficiaries incurred ₦837.83 on clothing in a month. The table further reveals the average mean household expenditure of beneficiaries to be ₦41,730.90 and that of non beneficiaries to be ₦12,411.74. This shows that the household of beneficiaries of DELPHE had high purchasing power than the households of the non beneficiaries. This might be due to the fact that the beneficiaries generate more income than the non beneficiaries. This is in agreement with the findings of Singh *et .al* (2015) that beneficiaries generates more income from their enterprises than the non-beneficiaries.

Table 5.21: Mean expenditure on household basic items by beneficiaries and non-beneficiaries of DELPHE project

Household basic item	Beneficiaries		Non-Beneficiaries	
	Household expenditure (₦)	Per capita expenditure(₦)	Household expenditure(₦)	Per capita expenditure (₦)
Food purchases	12,091.45	1,677.39	1,607.28	178.78
Imputed own consumption	1,977.64	274.29	722.67	80.38
Education	27,688.53	3,840.29	5,067.56	563.68
Health	4,826.86	669.46	994.13	110.58
Bills on utilities (Water, electricity)	1,216.00	168.65	804.05	89.43
Clothing	2,725.59	378.02	837.83	93.19
Rent (actual or imputed)	1,500.00	500.43	800.00	88.98
Household maintenance	1,338.21	185.60	548.22	60.98
Ceremonial expenditure	1547.56	214.64	426.40	47.43
Transportation	1531.70	212.44	780.00	86.76
Taxes	266.00	36.89	243.00	27.03
Communication and Telephone	2116.09	293.49	300.00	33.37
Remittance	888.53	123.23	000.00	00.00

Mean: household expenditure of beneficiaries= ₦41,730.90, Std. = 42637.97

Household expenditure of non beneficiaries = ₦ 12,411.74, Standard deviation = 4114.55

Source: Data Analysis, 2014

5.10.2 Percentage contribution of the beneficiaries and non beneficiaries and their spouses to monthly household expenditure

This assessment is necessary so as to ascertain whether the expense in the household was due to the women enterprises. Result of findings as presented in Table 5.22, shows that the beneficiaries contributed 42.7% while their spouses contributed 57.3% to monthly household expenditure. The non beneficiaries contributed 66.5% while their spouses contributed 33.5 % to the monthly household expenditure. However, the study went further to determine the average mean amount contributed by the beneficiaries which is (42.7% of ₦41730.90) ₦17,819.09 and the non beneficiaries which is (66.5% of ₦12411.74) ₦8253.80. It can be inferred that the beneficiaries' contribute more than the non beneficiaries to household expenditure. This might be because rural women beneficiaries were empowered, and they generate more income, so they are able to contribute their quota to the household expenditure. (Adu-Okoree,2012).

Table 5.22: Percentage contribution of the beneficiaries and non beneficiaries'

Respondents categories	N	Percentage contribution of respondents	Percentage contribution of spouse	Mean amount contributed by respondents	Std deviation
Beneficiaries	216	42.5%	57.5%	₦17,819.09	33.81705
Non- beneficiaries	88	66.5	33.5%	₦8253.80	27.42585

Source: Data Analysis, 2014

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5.10.3 Categorisation of respondents' welfare status

The mean of expenses of the respondents at the different welfare categories on Table 5.23 revealed that those at the worse-off category spend ₦1,490.93 per month while those in the better-off category spend ₦11,998.31 per month. The welfare status of respondents was categorised using the $\frac{2}{3}$ of households' per capita expenditure (₦5837.13) as the benchmark between the better-off and the worse-off categories. The results on Table 5.24 showed that majority (83.3%) of beneficiaries were better off while only 31.8% of non-beneficiaries were worse off. This implies that beneficiaries had a higher welfare status than non-beneficiaries. Hence, DELPHE had helped improved the welfare status of beneficiaries.

Table 5.23: Mean expenditure of beneficiaries of DELPHE project at different levels of welfare categories

Welfare level	Score range	Mean	Standard deviation	Standard error
Worse off	₦1,500 - ₦5,836	₦1,490.93	661.8	36.2
Better off	₦5,387 - ₦16,500	₦11,998.31	21414.4	1698.2

Source: Data Analysis, 2014

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Table 5.24: Categorisation on beneficiaries and non-beneficiaries of DELPHE project level of welfare status

Welfare status	Score range	Beneficiaries (n=216)		Non-beneficiaries (n=88)		Mean
		Freq.	Percent	Freq.	Percent	
Better off	(₦ 5,837- ₦ 16,500)	180	83.3	28	31.8	₦ 5,837
Worse off	(₦ 1,500- ₦ 5,836)	36	16.7	60	68.2	

Source: Data Analysis, 2014

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5.11 Contributions of the independent variable to welfare status of DELPHE beneficiaries

The welfare status model was estimated using multiple linear regression and the results of the estimated model is presented in Table 5.25. An R value of 0.60 showed that there was a correlation between the independent variables and welfare status. The independent variables that contributed significantly to welfare status were: income ($\beta=0.123$, $p=0.000$), occupation ($\beta=0.125$, $p=0.030$), implying that income and occupation increases the probability of respondents' welfare status. It also shows that benefits derived in DELPHE ($\beta= 0.847$, $p=0.000$) significantly influenced welfare status of the beneficiaries. The table further revealed that, year of education ($\beta=0.003$), years of processing experience ($\beta=-0.006$), household size ($\beta =-0.044$), constraints ($\beta=-0.483$) had inverse relationship implying that the increase in household size, education, experience, benefits derived from Fadama programme, and constraint resulted in decreased welfare status. This implies that contributors to welfare status were constraints to processing activities, years of education, household size, and income. Benefits derived in DELPHE project ($\beta = 0.847$, $p=0.000$) also contributed to welfare status of respondents. The implication is that DELPHE project had a positive impact on the welfare status of the beneficiaries.

Table 5.25: Contribution of independent variables to welfare status of the beneficiaries of DELPHE

Source	SS	df	MS	F	P- value
Between	21.732	8	2.716	19.644	0.000
Within	40.795	216	0.138		
Total	62.526	216			

R = 0. 60

$R^2 = 0.360$

Adjusted= 0.330

Std Error of the Estimate= 0.37187

Variables	B	Standard error	t	P-value
Constant	8.317	0.66	12.57	0.000
Years of education	-0.003	0.03	-0.12	0.908
Years of processing experience	-0.006	0.09	-0.65	0.093
Household size	-0.044	0.23	-1.69	0.093
Processing as primary occupation	0.125	0.57	2.18	0.030*
Benefits derived from DELPHE programme	0.847	0.18	4.69	0.000 *
Income	0.123	0.56	2.14	0.000*
Constraints to processing activities	-0.483	0.27	-1.78	0.077

Source: Data Analysis, 2014

5.12 Contributions of the independent variable to welfare status of the beneficiaries in Osun state

The welfare status model of Osun state beneficiaries was estimated using multiple linear regression and the results of the estimated model is presented in Table 5.26. The independent variables that contributed significantly to welfare status were: year of processing experience ($\beta=0.189$, $p=0.000$), income ($\beta=0.123$, $p=0.000$), implying that year of processing experience and income raises the possibility of increasing the welfare status of beneficiaries in the state.

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Table 5.26: Contribution of independent variables to welfare status of Osun state beneficiaries

Source	SS	df	MS	F	P-value
Between	2.629	9	0,292	2.687	0.006
Within	24. 247	110	0.109		
Total	26.876				

R = 0. 313

R² = 0.98

Adjusted = 0.61

Std Error of the Estimate = 0.32974

Variables	β	Standard error	t-value	p-value
Constant	0.989	0.16	6.22	0.000
Years of processing experience	0.189	0.05	2.65	0.000*
Income	0.123	0.56	2.14	0.000*
Household size	0.003	0.05	0.04	0.970
Occupation	0.037	0.17	0.55	0.583

Source: Data Analysis, 2014

5.13 Contributions of the independent variable to welfare status of Oyo state beneficiaries

The welfare status model of Oyo state beneficiaries was estimated using multiple linear regression and the results of the estimated model is presented in Table 5.27. The independent variables that contributed significantly to welfare status were: year of processing experience ($\beta=0.375$, $p=0.002$), income ($\beta=0.267$, $p=0.000$), implying that year of processing experience and income rises the chance of increasing the welfare status of beneficiaries in the state.

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Table 5.27: Contributions of independent variables to welfare status of Oyo state beneficiaries

Source	SS	df	MS	F	P-value
Between	2.629	9	0,292	2.687	0.006
Within	24. 247	96	0.109		
Total	26.876				

R = 0. 313

R² = 0.98

Adjusted= 0.61

Std Error of the Estimate= 0.32974

Variables	β	Standard error	t-value	p-value
Constant	0.011	0.16	0.07	0.944
Years of processing experience	0.375	0.02	7.41	0.002*
Income	0.267	0.02	5.48	0.000*
Household size	0.003	0.01	0.40	0.970
Occupation	-0.037	0.02	- 0.55	0.583

Source: Data Analysis, 2014

5.14 Hypotheses Testing

This section presents the findings from test of hypotheses to determine whether any significant relationship or difference that exists between independent and dependent variables used in the study area.

5.14.1 Hypothesis 1

The results of Chi-square analysis in Table 5.28 shows that education, ($p= 0.030$), $\chi^2 = 3.372$, primary occupation ($p=0.00$), $\chi^2 = 56.679$, and secondary occupations ($p=0.00$), $\chi^2 = 31.575$ of the respondents had significant relationship with their welfare status. This implies that literate respondents tend to have more improved welfare status than illiterate respondents. This corroborates the findings of Lareau (2003) that education had relationship with welfare status.

Table 5.23 shows the result of PPMC analysis that respondent's age had significant correlation with their welfare status at r- value of 0.264, ($p= 0.05$). This is possible because higher per capital expenditure is a continuous variable that increases with age. Similarly, the results show a correlation between the household size and their welfare status at r- value of 0.580, ($p < 0.05$), which implies that the larger the household size, the higher the welfare status. Increased household size in the rural settings leads to more family labour which brings about more income that translates into better welfare status. Also, Table 5.29 shows that respondents' monthly income has significant correlation with welfare status at r-value of 0.483, ($p < 0.05$). This implies that income is an important welfare status indicator because income would provide most of the needed fund for investment which translates into improved welfare status. It can also be inferred that the primary and secondary occupation engaged in by the respondents influences their welfare status.

The results in Table 5.29 also revealed that respondents' processing experience had correlation with welfare status at r-value of 0.396. ($p=0.05$). This implies that the more the processing experience of respondents the higher their welfare status

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Table 5.28: Relationship between socio economic characteristics and welfare status

Variable	χ^2	Df	p-value	Decision
Marital status	2.976	4	0.562	NS
Religion	2.117	3	0.548	NS
Primary occupation	56.679*	6	0.000	S
Secondary occupation	31.575*	4	0.000	S
Education	3.372*	4	0.030	S

df= Degree of freedom

χ^2 = Chi square

P= probability level

*= Chi square is significant at < 0.05

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Table 5.29: Relationship between socio economic characteristics and welfare status using PPMC

Variables	r-value	p-value	Decision
Age	0.264	0.000	Significant
Household size	0.580	0.032	Significant
Monthly income	0.483	0.000	Significant
Processing experience	0.396	0.001	Significant

r= Correlation

p= probability level

** Correlation at 0.01 levels (2-tailed)

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5.14.2 Hypothesis 2

The result of PPMC analysis in Table 5.30 shows that there is significant relationship between beneficiaries attitude towards DELPHE project and welfare status of respondents at r-value of 0.424, ($p=0.000$). In case of DELPHE project, the degree of like or dislike for the project's activities will definitely influence their level of participation in the project activities and consequently leads to improved welfare status. This implies that more favourable attitude respondents have towards the activities of the project, the more improvement in their welfare status.

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Table 5.30: Relationship between beneficiaries' attitude towards the project and welfare status using PPMC

Variables	N	r-value	p-value
Attitude of beneficiaries and welfare status	216	0.424	0.000

** Correlation is significant at the 0.01 level (2-tailed)

Source: Data Analysis, 2014

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5.14.3 Hypothesis 3

The results of PPMC analysis in the Table 5.31 shows there is a significant relationship between the benefits derived from DELPHE project and welfare status at r-value of 0.014 (p= 0.017). The implication of this result is that beneficiaries of the project are expected to have improved welfare status as a result of the significance of their benefits derived.

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Table 5.31: Relationship between benefits derived from DELPHE project and welfare status using PPMC

Variables	N	r-value	P-value
Benefits derived by beneficiaries and welfare status	216	0.014	0.017

**Correlation is significant at the 0.01 level (2-tailed)

Source: Data Analysis, 2014

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5.14.4 Hypothesis 4

The results in the Table 5.32 using PPMC analysis, shows there is a significant relationship between the constraints faced by respondents on various processing activities and welfare status at r-value of -0.153 (p= 0.009).The negative correlation suggests that as constraints faced increases, the lower the welfare status. This implies that when the respondents are faced with a lot of constraints such as high cost of processing machines, they become limited in terms of enterprise expansion, thus leading to reduction in welfare status.

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Table 5.32: Relationship between constraints and welfare status

Variable	r	p	Decision
Constraints	-0.153	0.009	Significant

Source: Data Analysis, 2014

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5.14.5 Hypothesis 5

The result in Table 5.33 and 5.34 using ANOVA shows the difference in the welfare status among respondents across processing activities. It reveals that there was a significant difference in the welfare status ($F= 2.696$, $p=0.46$) of respondents across various processing activities. Post hoc test by Duncan revealed that the difference in welfare status was from the cassava processors. Cassava (3490.62), Oil palm (3638.42) and Soybean (4489.50) were significantly the same, while Moringa processor had higher welfare status than other processors. This implies that there was a significant difference among the various processing categories in the study area.

Table 5.33: Difference between welfare statuses of beneficiaries across processing enterprise categories

	df	Sum of square	Mean square	F	P – value	Decision
Between group	3	1714318833.21	571439611.1	2.696	0.046	Significant
Within group	304	63578801802.9	211929339.3			

Source: Data Analysis, 2014

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Table 5.34: Post-hoc test for the differences observed in welfare status of rural dwellers among various processing enterprise categories

Processing enterprise categories	N	1	2
Cassava	108	3490.62	
Soybean	40	4489.50	
Moringa	67		8726.25
Oil-palm	89	3638.42	
Significant		0.036	

Source: Data Analysis, 2014

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5.14.6 Hypothesis 6

Difference in welfare status between beneficiaries and non beneficiaries

The result of t-test analysis in Table 5.35 shows that there is a significant difference ($p=0.001$) in the welfare status of beneficiaries and non beneficiaries. From the mean, it can deduced that beneficiaries (₦7,629.53± ₦1,710.60) in DELPHE project were better off than non-beneficiaries (₦7,629.53± ₦1,710.60). (₦1,437.60±₦721.59) This implies that the beneficiaries had higher welfare status those non-beneficiaries. Hence, DELPHE programme significantly contributed to the welfare status of women processors who participated in the programme.

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Table 5.35: Independent t-test analysis showing the difference in welfare status among beneficiaries' and non-beneficiaries'

Variable		N	SD	Mean	Mean difference	T	df	P
Welfare status	Non-beneficiaries	88	721.59	1437.60	6191.92	3.39	302	0.001
	Beneficiaries	216	1710.60	7629.53				

Source: Data Analysis, 2014

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5.14.7 Hypothesis 7

Difference in welfare status between beneficiaries of Osun state and Oyo state beneficiaries

The result in Table 5.36 using t-test analysis, shows that there is a significant difference ($p=0.000$) in the welfare status of Osun state beneficiaries and Oyo state beneficiaries. From the mean, it can deduce that Osun state beneficiaries ($\text{₦}8719 \pm 0.66779$) in DELPHE project were better off than Oyo state beneficiaries ($\text{₦}1218 \pm 17097.60$). This implies that Osun state beneficiaries had higher welfare status than Oyo state beneficiaries. Hence, DELPHE programme significantly contributed to the welfare status of women processors who participated in the programme from Osun state than those in Oyo state.

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Table 5.36: Independent t-test analysis showing the difference in welfare status among Osun state beneficiaries and Oyo state beneficiaries

Variable		N	SD	Mean	Mean difference	t	Df	P
Welfare status	Oyo state Beneficiaries	95	0.3349	1281	74380	-17.275	216	0.000
	Osun state Beneficiaries	121	0.3349	8719				

Source: Data Analysis, 2014

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SUMMARY, CONCLUSION AND RECOMMENDATION

The summary of the preceding chapters and highlights of the major findings are presented in this chapter. Also presented are the conclusions, recommendations, contributions to knowledge and areas for further study.

6.1 Summary

The study investigated the effect of Development in Higher Education (DELPHE) on the welfare status of the rural women processors in Oyo and Osun States, Nigeria. This was necessitated by dearth of effective processing facilities that has limited rural women processors' productivity. Despite many programmes sponsored by either Federal government or international agencies to improve the welfare status of rural women, they still lag behind in terms of socio economic advancement. Specific objectives used in addressing this issue were; socio economic and enterprise characteristics of respondents, knowledge on various processing activities, participation in the project activities, benefit derived and attitude towards the project, constraints faced by the respondents in their various processing activities and the welfare status of the rural women processors in the study area . Hypotheses were formulated and tested to determine the relationship between the independent and dependent variables. Also, tests of difference were carried out to assess the disparity in welfare status across the various processing enterprise categories and among beneficiaries and non-beneficiaries of DELPHE project in the study area.

The major concept upon which the study rests is on welfare status. The framework assumed the welfare status is determined by the independent variables. The population of the study consisted of the beneficiaries and the non beneficiaries of DELPHE project in Oyo and Osun states. Multi- stage sampling procedure was used in selecting respondents for this study.

Purposive and proportionate sampling technique was used to select 243 respondents each from the beneficiaries and non-beneficiaries. Propensity Score Matching (PSM) was carried out and the numbers of matched respondents after PSM were 216 beneficiaries and 88 non-beneficiaries which gave a total sample size of 304 respondents

Quantitative data were collected using structured questionnaire while qualitative data were collected through Focus Group Discussion (FGD). A total of eight (8) FGDs were conducted. The data collected were analysed using both descriptive (frequency, percentages, and charts) and inferential statistics tools used were Chi-square, PPMC, t-test and ANOVA. The results of the inferential statistics were determined at 0.05 significance level. The contributions of the independent variables to welfare status were determined using regression analysis.

6.2 Summary of major findings

The finding of the study reveals that more than half of the respondents were within the age range of 41-50 with an average age of 43.9 years. Respondents were mostly married (87.0% beneficiaries and 86.0% non beneficiaries). The highest educational attainment was primary school education as indicated by respondents (30.0% beneficiaries and 27.3% non-beneficiaries) while 58.3% beneficiaries and 56.0% non beneficiaries were Christians. The modal household size was 5-8 people (60.2% beneficiaries and 60.0% non beneficiaries) with an average household size of six people. Majority of the respondents (81.1% beneficiaries, 82.0% non-beneficiaries) households were headed by a male, and most of the respondents (76.0% beneficiaries, and 72.0% non beneficiaries) married more than one wife.

Out of all the groups the beneficiaries belong to, the beneficiaries of DELPHE (99.0%) benefitted from training programme of the project, Processing was their primary occupation (83.0% beneficiaries, and 72.0% non beneficiaries) while they engaged in trading, farming and

artisan as their secondary occupation (16.7% beneficiaries and 28.2% non-beneficiaries). Majority of the processors, 88.3% of the Moringa beneficiaries processors, 83.3% Soybean beneficiaries processors, 81.8% Cassava beneficiaries processors, and 74.6% of the Oil-palm beneficiaries processors realised # 31,000 and above monthly, while the 55.3% of the cassava non beneficiaries processors, 52.0% of the oil-palm beneficiaries, 20.3% of the soybean non-beneficiaries, and 17.6% Of the Moringa non- beneficiaries processors also realised #31,000 and above monthly. About 35.0% beneficiaries, and 36.3% non-beneficiaries were into cassava processing, 30.0% beneficiaries and 28.4% Of non-beneficiaries engaged in oil palm processing, 21.0% beneficiaries, 24.6% non-beneficiaries were into moringa processing while 14.0% beneficiaries and 11.3% non beneficiaries were into soybean processing.

About 50.8% beneficiaries and 47.0% non-beneficiaries have been processing for at least 10 years, while 50.0% beneficiaries, 40.0% non-beneficiaries acquired their land through inheritance, 56.0% beneficiaries and 40.0% non-beneficiaries engaged the use of their children as their family labour, 52.0% beneficiaries 46.0% non-beneficiaries had money from their personal savings while 58.0% beneficiaries and 40.0% non beneficiaries received information from social groups as their source of information. Generally, across the four categories of processing activities, the Moringa processors were more knowledgeable than other processors. Level of participation in the project activities was high as indicated by 63.4% of the beneficiaries while 65.7% had high level of benefit.

Analysis of attitudinal disposition towards the project showed that 56.0% of the beneficiaries had favourable disposition towards the project. Mean attitudinal score was 62.9 ± 6.44 . Generally, lack of credit facilities was ranked the major constraints as indicated by 55.1% beneficiaries and 53.0% non beneficiaries. Moringa processors were better-off in their

welfare status than other processing groups while the beneficiaries of the DELPHE projects (83.3.0%) were also better off in welfare status than the non-beneficiaries (31.8%) of the projects. Socio- economic and enterprise characteristics variables that contributed to welfare status were years of education ($\beta=-0.003$), occupation ($\beta=0.125$), years of processing experience ($\beta=-0.006$), household size ($\beta= 0.044$)

Significant relationship existed between the respondents' welfare status and education ($\chi^2 = 3.372$), primary occupation ($\chi^2 =56.679$). There was a correlation between welfare status of the respondents and age ($r= 0.264$), household size ($r=0.580$), Monthly income ($r=0.483$) and processing experience ($r= 0.396$). Welfare status was significantly influenced by attitude ($r=0.424$), benefits derived ($r=0.014$), and constraints ($r=- 0.153$). Significant difference existed between the welfare statuses of beneficiaries and non-beneficiaries.

6.3 Conclusions

The findings revealed that the respondents (beneficiaries and non beneficiaries) are not different in terms of characteristics such as age, marital status, religion, education, year of processing experience; however, DELPHE project beneficiaries generated more income than their counterpart. The implication of this is that more income may improve the welfare status of beneficiaries.

The beneficiaries of DELPHE project were found to be more knowledgeable than the non-beneficiaries and *Moringa oleifera* processors had more knowledge than all entrepreneurs of other processing categories. This is attributable to skill acquired during the training programme activity of the project which enhances their production level and in turn improve their welfare status. Of all the activities the beneficiaries of the project participated in, contribution to decision making ranked first, followed by meeting attendance, participation in training activity and obtaining revolving loan. The beneficiaries of DELPHE project had better welfare status basically because the project offered more benefits in terms of skill acquisition which informed beneficiaries' favourable disposition towards the project.

Sustained high level of welfare status among beneficiaries of DELPHE project is expected to address the major constraints of the processors which is lack of finance. The project beneficiaries had higher SES after participating in the DELPHE project. DELPHE project evidently improved beneficiaries' welfare status as they had better welfare status than the non beneficiaries.

The findings of this study had shown that the beneficiaries had high level of knowledge, probably because of their high level of participation in the project activities. Also beneficiaries

derived benefits from the DELPHE project in the study area and they have favourable attitude towards the project.

6.4 Recommendations

Based on the findings of the study, the following recommendations were made:

1. The study recommends that the project beneficiaries should be monitored in order to concretise the benefits derived from the intervention
2. As lack of credit was identified as a major constraint facing the respondents in their processing activities due to insufficient revolving loan as start up capital, there is a need for provision of loan at a reduced interest rate by financial institution such as micro-finance for the rural women to expand their processing business.
3. Given the fact that skill acquisition is one of the components that can take rural women out of poverty. This strategy should be incorporated into development interventions programme addressing women welfare status.
4. DELPHE project or similar interventions should be replicated in other states of Nigeria, so that standard of living of other rural women.
5. Government and NGOs should focus on programmes that enhance the skills of rural women especially in the area of their enterprise
6. Organisers of programmes should provide incentives during training in order to increase participation in programmes
7. Given that income contributes significantly to welfare status, agricultural policy formulated should target increased income generated from enterprise of rural women.

6.5 Contributions to Knowledge

The study contributes to the body of knowledge in the following ways:

1. DELPHE beneficiaries had higher better welfare status compared to non-beneficiaries. This implies significant impact of DELPHE on beneficiaries' welfare status.
2. Income and processing experience were significant contributing factors to welfare status of DELPHE beneficiaries.
3. The study established that beneficiaries in the better welfare category had higher benefits than those in the low welfare category.
4. Participation in training and skill acquisition has the potential to increase income and welfare status of rural women

6.6 Areas for further research

- Analysis of development programmes' contributions to the welfare status of rural women processors in the study area.
- Contribution of development programmes that focused development of rural women processors.

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APPENDICES

APPENDIX 1

FOCUS GROUP DISCUSSIONS GUIDE FOR PARTICIPANTS OF DELPHE PROJECT

RESEARCH TITLE: EFFECTS OF DEVELOPMENT PARTNERSHIP IN HIGHER EDUCATION (DELPHE) PROJECT ON WELFARE STATUS OF WOMEN PROCESSORS IN OYO AND OSUN STATES, NIGERIA

Date of FGD _____

Name of Interviewer _____

Type of Processor _____

LGA _____

STATE _____

Introduction to inform participants of the purpose of the FGD

The Development Partnership in Higher Education Project started in September 2009. The project was implemented in Oyo and Osun States, Nigeria. The project goal is to reduce poverty by improving living conditions of women by empowering and supporting them to effectively manage their own development.

Since successful implementation supposed to improve welfare status of the beneficiaries, so we encourage you to give accurate and comprehensive information as possible. Thank you.

Mojisola F. Oywole.

1. How did you first hear about DELPHE? _____
2. How would you rate the level of Development in this community before the introduction of DELPHE?
High _____, Average _____ Low _____
3. In which of the project areas have you participated?

4. What are the benefits you derive from participating in DELPHE?

5. What are the challenges confronting beneficiaries of DELPHE projects?

6. What are the problems facing you in your processing activities that can lead to poor standard of living?

7. What are the ways you have ever tried to solve these problems?

8. How can you compare your welfare status in terms of amount spent on household expenditure now with what you are spending before participating in DELPHE project activities?
Better off _____, Worse off _____, No difference _____
9. Would you like to continue participating DELPHE project?

10. Suggestions ways we can improve on future developmental projects? _____

APPENDIX 2

EFFECTS OF DEVELOPMENT PARTNERSHIP IN HIGHER EDUCATION (DELPHE) PROJECT ON WELFARE STATUS OF WOMEN PROCESSORS IN OYO AND OSUN STATES, NIGERIA

INTRODUCTION

This interview schedule is designed to solicit information from beneficiaries and non-beneficiaries of DELPHE project in OYO and Osun states, Nigeria. Kindly provide answers to the raised items as the information gathered shall be kept confidential for research purpose only.

Thank you,

M.F. Oyewole

Respondent No _____

Name of community _____

Local government area _____

State _____

Date _____

SECTION A:

Socio- economic characteristics

1. Age (in years) _____
2. Marital status: (a) Single [] (b) Married [] (c) Divorced [] (d) Widow []
3. Religion: (a) Islam [] (b) Christianity [] (c) Traditional []

4. Education: (a) No formal education [] (b) Adult education [] (c) Vocational education []
(d) Primary education [] (e) Secondary education [] (f) Tertiary education
5. Household size: (a) 1 – 4 [] (b) 5 – 8 [] (c) 9 – 12 []
6. Household type: your household is headed by _____ (a) Male (b) Female []
7. Membership of group: Please indicate your group membership from the options provided: (a) Co-operative group [] (b) Religious group [] (c) Processors group [] (d) Market women group [] (e) Fadama users group [] (f) DELPHE beneficiaries group [] (g) NPFS group []
8. Position as wife: (a) 1st position [] (b) 2nd position [] (c) 3rd position [] (d) 4th position [] (e) 5th position and above []

SECTION B: Enterprise characteristics

9. What is your primary occupation? (a) Processing [] (b) Petty trading [] (c) Artisan []
(d) Civil servant [] (e) others specify _____
10. What is your secondary occupation? (a) Processing [] (b) Petty trading [] (c) Artisan []
(d) Civil servant [] (e) others specify _____
11. Income: Please indicate your actual income on your processed products _____ in a month/ naira
12. What type of processing activities do you engaged in? (a) Moringa processing [] (b) Soybean processing [] (c) Cassava processing [] (d) Oil-palm processing []
13. Processing experience (in years) _____

14. Source (s) of labour _____ (a) Hired labour [] (b) Family labour [] (c) Work exchange group []

15. Land acquisition: (a) Purchase [] (b) Rent/lease [] (c) Inheritance [] (d) Government []

16. Sources of finance: (a) Self [] (b) Co-operatives [] (c) Banks []

17. Sources of Information on their processing activities: (a) Radio [] (b) Television [] (c) Family and friends [] (d) Newspaper [] (e) Social group

Section C: Knowledge on various processing enterprise activities

18. Indicate the correct answers on the knowledge statements on various enterprise processing activities by responding appropriately.

Knowledge questions on enterprise categories

<p>Moringa oleifera Production and Processing Enterprise</p> <p>(1) Moringa oleifera can be planted with _____</p> <p>(a) Seeds and seedlings (b) Grains and pods (c) Leaves and roots</p> <p>(2) Moringa oleifera seeds germinate within _____ days.</p> <p>(a) 5- 6 days (b) 3 -4 days (c) 7- 8 days.</p> <p>(3) Seeds of moringa can be planted in --- _____ soil.</p> <p>(a) Loamy (b) Sandy (c) Clay</p> <p>(4) Moringa oleifera leaves can be processed into powder with the following equipment except _____</p> <p>(a) Refrigerator (b) Dryer (c) Sifter</p> <p>(5) One of the steps involved in processing Moringa oleifera leaves into powder is by _____</p> <p>(a) Soaking of leaves (b) Drying of the leaves (c) Boiling of leaves</p> <p>(6) Moringa powder can be stored in _____</p> <p>(a) Dark cupboards (b) directly under sunlight (c) Air- tight container</p> <p>(7) Moringa oleifera can be processed into the following except _____</p> <p>(a) Moringa powder (b) Moringa Tea (c) Moringa Cloth.</p> <p>(8) _____ parts of Moringa can be used to process into oil.</p> <p>(a) Seeds (b) pods (c) Root</p> <p>(9) Leaves and seeds of Moringa oleifera cannot be eaten raw?</p> <p>(a) True (b) False (c) I don't know</p> <p>(10) Processed Moringa powder can be stored in _____</p> <p>(a) Basket (b) Air tight container (c) bowl</p>	<p>Soybean Processing and Value Addition</p> <p>(1) Soybean cannot be added to other staple crops such as maize, cowpea, and cassava for value addition?</p> <p>(a) True (b) false (c) I don't know.</p> <p>(2) Soy moimoin consists of _____</p> <p>(a) Soybean and Cowpea, (b) Soybean and maize (c) Soybean and Cassava</p> <p>(3) _____ can be extracted in Soybean to produce Soymilk.</p> <p>(a) Meat (b) Milk (c) Oil</p> <p>(4) Soybean cannot be processed into various products such as Soymilk, Soy cheese, Soy cake etc.?</p> <p>(a) True (b) False (c) I don't Know</p> <p>(5) Dehulling is one of the processing steps _____</p> <p>(a) Soy cheese (b) Soya gari (c) Soy flour.</p> <p>(6) The following are steps involved in Soymilk processing except _____</p> <p>(a) Boiling (b) Sieving (c) grating</p> <p>(7) _____ is the processing method that destroy Soybean anti- nutrient</p> <p>(a) Fermentation (b) Heating (c) Drying</p> <p>(8) Soy flour can be added to wheat flour for __ production.</p> <p>(a) Soy cheese (b) Soy cake (c) Soymilk</p> <p>(9) Soymilk can be _____ to improve its shelf life</p> <p>(a) Refrigerated (b) Fermented (c) Dried.</p> <p>(10) Soybean processing should be carried out under _____ condition.</p> <p>(a) good hygienic (b) unclean environment (c) dirty</p>	<p>Palm Oil Processing and Marketing</p> <p>(1) One of the steps in which oil palm can be process is by cooking the _____</p> <p>(a) Palm fruit (b) Palm frond (c) Palm tree</p> <p>(2) Oil palm can be processed into _____ types of oil.</p> <p>(a) 5 (b) 4 (c) 2</p> <p>(3) One of the steps in processing that differentiate the Hard and Soft oil is _____</p> <p>(a) Fermentation process in hard oil and boiling process in soft oil (b) Pressing out the liquid oil (c) Purification of the oil.</p> <p>(4) The following are the processing operations in palm oil processing except _____</p> <p>(a) Threshing (b) Frying (c) Sterilization</p> <p>(5) The first stage of palm oil processing is _____</p> <p>(a) Purification of oil (b) Separation of palm fruit from the bunch (c) Clarification of oil</p> <p>(6) _____ and _____ are methods of extracting oil from the oil palm fruit.</p> <p>(a) Long and Short (b) Dry and Wet (c) Vertical and Horizontal</p> <p>(7) The last stage of palm oil processing is _____</p> <p>(a) Purification (b) pressing of oil (c) clarification of oil</p> <p>(8) _____ yield is very high</p> <p>(a) Hard oil (b) Soft oil (c) liquid oil</p> <p>(9) Extracting or pressing of the oil can be done in _____ ways</p> <p>(a) 3 (b) 1 (c) 2</p> <p>(10) Palm oil can be stored in the following except _____</p> <p>(a) Oil drums (b) kegs (c) basket</p>	<p>Cassava Processing and Marketing for Sustainable Livelihood</p> <p>(1) The following steps are involved in cassava processing except _____</p> <p>(a) Peeling (b) Boiling (c) Grating</p> <p>(2) The next step of processing cassava into gari after washing and peeling is _____</p> <p>(a) Grating (b) drying (c) sifting</p> <p>(3) The following equipment are used in cassava processing except _____</p> <p>(a) Hydraulic jack machine (b) Milling machine (c) Refrigerator</p> <p>(4) Dewatering steps in cassava processing helps to _____ of the product.</p> <p>(a) Increase the moisture content (b) Reduces the temperature (c) Improve the shelf life</p> <p>(5) Fermentation is a necessary step in cassava processing (a) True (b) False (c) I don't know</p> <p>(6) Fermentation process helps to _____</p> <p>(a) Get rid of cyanide (b) get finer texture of product (c) add flavour to product</p> <p>(7) Sifted cassava flour is best packed in _____ to improve its shelf life.</p> <p>(a) basket (b) Airtight container (c) tank</p> <p>(8) One of the accessible markets for cassava flour is _____</p> <p>(a) Bakeries (b) Airports (c) Railway Station.</p> <p>(9) Cyanide is a poisonous substance in cassava product</p> <p>(a) True (b) False (c) I don't know</p> <p>(10) There is readily available market for cassava processed products.</p> <p>(a) True (b) false (c) I don't know</p>
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Section D: PARTICIPATION IN DELPHE PROJECTS

19. Please tick an option in front of each of the questions below about participation in DELPHE activities.

Level of Participation in DELPHE project

Level of Participation	Always	Rarely	Never
Project activities: Participation in group formation			
Attendance in all meetings called by the project facilitator			
Regularity Payment of community dues			
Contribution in decision making on DELPHE project			
Capacity building: Participation in training, seminars, or workshops			
Participation in field activities			
Empowerment: Participation in obtaining revolving loan			
Participation in procurement of equipment.			

Section E: Benefits derived in the project and other interventions

20. Indicates the benefits you derived from participating in DELPHE, Fadama and NPFS programmes

Benefits derived from participating in DELPHE project

Benefits	To a large extent	To a lesser extent	Not at all
Skill enhancement			
Increase in yield			
Access to revolving loan			
Training/Empowerment			
Enterprise Expansion			
Improved Standard of living			
Increase in processing equipment			
Self employments opportunity			
Others specify_____ -			

Benefits Derived from participating in Fadama project

Benefits	To a large extent	To a lesser extent	Not at all
Skill enhancement			
Increase in yield			
Access to revolving loan			
Training/Empowerment			
Enterprise Expansion			
Improved Standard of living			
Increase in processing equipment			
Self employments opportunity			
Others specify _____ -			

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Benefits Derived from participating in NPFS project

Benefits	To a large extent	To a lesser extent	Not at all
Skill enhancement			
Increase in yield			
Access to revolving loan			
Training/Empowerment			
Enterprise Expansion			
Improved Standard of living			
Increase in processing equipment			
Self employments opportunity			
Others specify _____ -			

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Section F: ATTITUDE OF THE RURAL WOMEN TOWARDS DELPHE PROJECT

21. Please respond appropriately to the following statements. SA= Strongly Agree, A= Agree, U= Undecided, D=disagree, and SD= Strongly disagree.

	STATEMENTS	SA	A	U	D	SD
1	The facilitators' conduct of training activities was not encouraging					
2	The training programme was too demanding in terms of energy					
3	The project left most of the beneficiaries better					
4	Participation in the project has helped to improve most of the beneficiaries network					
5	Most of DELPHE project activities are waste of time					
6	Identification of members problem was deficient in the project					
7	The DELPHE project enhances the beneficiaries processing skill					
8	It is a life changing project.					
9	The DELPHE project had not helped most of the beneficiaries to acquired new knowledge.					
10	Participation in the project is too demanding					
11	The project help beneficiaries to discover new things					
12	General welfare status of beneficiaries was not enhanced by the DELPHE project					
13	Communication was not effective in the execution of the project					
14	The programme has no effect on my income					
15	Participating in DELPHE has increased my assets.					
16	DELPHE project has not strengthened membership cooperation					
17	The achievement of DELPHE project are not visible					
18	DELPHE project requires low investment					

Section G: Constraints faced on various processing activities

22. Please tick options in front of each constraints and rank appropriately.

Constraints	Serious constraint	Mild	Not constraint	a	Rank
High cost of processing machine					
Lack of credit facilities					
Lack of technical know how					
Unavailability of land for processing activities					
Unavailability of market for processed products					
Lack of good storage facilities					
Others specify					

Section H: Welfare Status

23. Please kindly indicate the amount of money you spend on the following basic items at intervals indicated

Categories	Basic Items	Amount Expended (₦)	
		Weekly	Monthly
Food	Food Purchases		
	Imputed own consumption		
Education	School fees		
	School books		
	Uniforms		
	Extracurricular activities		
	Transportation		
	Other school related expenditure		
Health	Consultations		
	Medication		
	Hospitalisation		
	Transportation		
	Other health care expenditure		
Bills and Utilities			
	Bills on utilities such as: water, electricity, etc.		
	Clothing		
	Household maintenance		
	Transportation		
	Communication e.g. telephone		
	Imputed self-produced non-food		
	Rent (actual or imputed)		
	Expenditure on small appliances		
Excluded	Ceremonial expenditure		
	Taxes		
	Transfers/Remittance		
Please specify others			



Plate 1: DELPHE Project Signpost in Iyanfoworogi Community, Ife East LGA, Osun State, Nigeria.



Plate 2: FGD with Moringa Women Processors at Iyanfoworogi Community, Ife East LGA Osun State.

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Plate 3: Researcher with Cassava Processors at Omi Adio, Ido LGA, Oyo State.

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Plate 4: Soybean Processor at Ojo Community, Egbedore LGA, Osun State



Plate 5: Researcher with Oil-palm Processors at Akufo Community, Oyo State.

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Plate 6: Interview Session with Respondent at Ayeso, Obokun LGA, Osun State.

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