



## IMPACT OF ENTREPRENEURSHIP ON POVERTY REDUCTION AMONG WOMEN ENTREPRENEURS IN KADUNA METROPOLIS

Aisha Liman

Department of Economics,  
Kaduna State University, Kaduna

Prof. Peter Njiforti

Department of Economics,  
Ahmadu Bello University, Zaria

---

### Abstract

*The study assesses the impact of entrepreneurship on poverty reduction among women entrepreneurs in metropolis, Kaduna State, Nigeria. The data were collected through structured questionnaire from a sample of 367 respondents drawn from 4 LGAs. The data was analyzed by the use of Foster Greer and Thorbecke mathematical measurement of poverty. The study found that the 52% of the women entrepreneurs out of the 367 sample of women entrepreneurs are living below the poverty line, while 48% of women entrepreneurs are above the poverty line. The poverty head count, depth and severity are, 0.52, 0.05 and 0.03 respectively. The implication of the findings is that women participation in business has empowered them by making them self employed and reducing poverty among them. Thus, study recommends that government should establish more empowerment programs for the women in the study area. And also government should make empowerment programs accessible to the women in remote areas to enable them revive their respective businesses.*

**Keywords:** Women, Entrepreneurship, and Poverty Reduction

---

### Introduction

Poverty has been recognized as a major problem and reducing it both at the global level as well as the national levels of different countries including Nigeria should be a priority for any government with the welfare of its citizenship at heart. Poverty is also known to affect women than men due to differences in education, employment and economic opportunities among others. Reducing poverty and improving the quality of life in developing countries is the most powerful indicator of economic growth. Strong economic growth advances human development, which in turn promotes economic growth and improved life style for the citizenship of the country. Poverty reduction with particular refers to women is very important for any society as women are the strong hold of any home front in the society.

Entrepreneurship is a key building block of an economy and a large share of the labor force in most developing countries. Women are also the backbone of economic growth and development they contribute immensely to the development of a country and play a vital role in both monetary and non-monetary economy (Sanusi, 2012). Women

empowerment is very necessary in an economy in order to reduce the rate of poverty among women by providing some programs by the state government. Empowerment encompasses all issues pertaining to the economic, social and cultural in a society, and varies in respect of time, place and social affiliation.

The participation of women in the economic activities is prerequisite for the development of a nation. The ability of a country to provide empowerment programs to encourage women to engage in small business has a multiplier effect and significant impact on their lives and the country in general (OECD, 2011). It is apparently essential to raise the status of women in the society so that they can also contribute toward the progress of their families and the state in general. The economic status of the women can be seen as an indicator of a society's progress and effective stage of development of that community. Therefore, it is imperative for the Nigeria and Kaduna state government to frame policy programs towards development of entrepreneurship among women in order to lessen the rate of poverty among women in the state. The status of women in Kaduna state

cannot be raised without sound empowerment policy programs that will encourage women to participate actively in small business in order to be independent and able to meet their basic needs not to depend on their husbands.

Women constitute an important social group in all known human societies. Apart from the significant role women play in the society through child bearing, their social, political and economic role cannot be over emphasized. Notwithstanding women has been facing revolved around bunch of challenges in various respective societies. In Nigeria where the rates of poverty have been on the high side over years, women continue to face disturbing challenges. Despite all effort made by Nigerian government and none formal organizations to curb poverty in the country, it has been to no avail. Women have been the strong hold of every household and instinctively need to satisfy the needs of the family. If women's' entrepreneurship efforts are complimented then the poverty rate in the country can be reduced and lively hood of the society improved greatly. Therefore, the study is to access impact of entrepreneurship on poverty reduction among women entrepreneurs in Kaduna metropolis.

### **Literature Review**

#### **Concept of Poverty**

It is always difficult to define the concept of poverty because drawing the line between the rich and the poor is not usually easy. However, the study defines poverty as a situation where by an individual is not able to live an easy and comfortable livelihood as a result of difficulty in accessing basic needs for everyday life, such as food, shelter, clothing, and education and so on and forth. The World Bank also defines poverty in the same direction as the inability to attain a minimum standard of living (World Bank report 2008)

#### **Concept of Entrepreneurship**

The whole idea or concept of an entrepreneurship is all about self-employment, self-reliance and self-contentment. It is for entrepreneurs to become job creators not job seekers through providing job opportunities not only to the entrepreneur but also to others as well.

Entrepreneurship has been defined by various authors to mean different things since the middle age (Igbo, 2006). The entrepreneur has been seen as an actor, innovator or a developer of technology. Entrepreneurship is the willingness and ability of an individual to seek out investment opportunities, establish and run an enterprise successfully (Inegbebor, 1987). National Directorate of Employment NDE (1989) and Onyebueke and Ochonogo (2002) defined entrepreneurship as the art, which involves recognizing a business

opportunity, mobilizing resources and persisting to exploit that opportunity.

### **Theoretical Literature**

The theoretical framework underpinning this study is liberal feminism. Liberal feminism discusses how sex and gender is intimately related to socialization. This theory goes in line with the work of Chinonye (2010) and Olabisi et al (2010). It sees women as disadvantaged relative to men due to open discrimination and to systemic factors which deprive them of vital resources required for business and economic decisions such as; finance, education and experience (Fisher, Reuber & Dyke, 1993). This theory works towards an egalitarian society, which would uphold the right of individuals to fulfill their potential (Kutanis & Bayraktaroglu, 2003). Liberal feminism advocates that social and economic reforms can only be possible if women are given the opportunities and status as their men counterpart to participate in economic developmental issues. If women are given the opportunity as their men counterparts by providing them with vital business resources and economic decisions will assist and elevate their economic, social and financial status in the society and as well as reduce the level of poverty amongst women in the communities of Kaduna metropolis. Participation in economic activities by women in Kaduna metropolis may help in addressing the poverty situation in the state. This theory guides this study as financing of women entrepreneurs can give them the opportunities and status to attain social and economic reforms that can uplift the lives of the women in particular and the society they live in, in general

### **Empirical Review**

Anyanwu (2010) this paper presents a profile of gendered poverty in Nigeria for the period 1980–1996. It examines the determinants of gendered poverty and specific measures that can be taken to reduce it, using the 1996 National Consumer Survey dataset. The results show that by 1996, the proportion of the rural population living below the poverty line stood at 72%, up from 46% in 1992. All the indices of poverty (headcount, depth, and severity) shown that poverty was more pronounced in female-headed households in 1980. The analysis shows that the variable “no occupation” significantly reduces gendered poverty in Nigeria, though it increases poverty for male-headed households, while production and “other” occupations in particular appear to significantly increase poverty in female-headed households. Location is also a factor in explaining gendered poverty in Nigeria. Our results and analyses above suggest that policy interventions are necessary to reduce poverty in Nigeria. First, there is a need to focus on gender-based poverty interventions

(World Bank, 1995; UNDP, 2005), especially among female-headed households in Nigeria.

Ifenkwe and Kalu (2012) in the paper *Poverty Management among Rural Women in Bende Local Government of Abia State, Nigeria*. The study assesses the poverty status of rural women in Bende Local Government Area of Abia State, Nigeria. One hundred and twenty (120) randomly selected women served as respondents, while data were analyzed using descriptive statistics, and probit regression model. Results showed the mean capital expenditure of the respondents as N10,038.13, indicating that sixty (60) percent of women in the study area were poor. The probit regression result showed that age was a significant and negative factor influencing the poverty status of the rural women, while education, household size and income level were significant but positive factors influencing their poverty status. The study recommends, among other things, promoting opportunities for empowering educationally-disadvantaged women to diversify into non-farm, income-generating activities in order to reduce their vulnerability to poverty, and as a means of managing or alleviating poverty in the area.

Oladimeji, Adepoju, and Abdulsalam (2015) *Reviving pottery enterprise: An impetus to poverty alleviation and self-reliance among women folks in Ilorin, Kwara State, Nigeria*. The study describes the socio-economic characteristics of pottery households, determine its profitability as a means of generating income, and reduce poverty in the study area. Primary data were generated through field surveys from a total of randomly selected 80 pottery household heads from 3 selected settlements. The main tools of analysis include descriptive statistics, gross margin and ordinary least square regression models. The average gross margin per pottery household per month ₦11,000 (\$68.8) showed that the enterprise is profitable. It is suggested that the pottery households should be given adequate training using community based informal education, to enable them imbibe mechanized pottery techniques and acquired materials inputs that will increase not only the profitability of the enterprise but also make efficient use of resources.

Taiwo, Agwu, Adetiloye, and Afolabi (2016) examined the impact of financing women entrepreneurs and employment generation within the Nigerian state. Descriptive statistics was the tool for analysis. The study reports that financing women entrepreneurs has incremental effects on employment generations and their efforts also results in multiple employment generations through improvement in their business activities, thereby increasing the numbers of self-employed

individuals in the country. The study recommends governmental intervention through the enactment of adequate policies tailored toward the encouragement and empowerment of women entrepreneurs.

Adeleye, Alli-Balogun, Afiemo and Bako (2016) examined the effects of goat production on the livelihood of women. 150 farmers selected purposively and equally from Igabi, Chikun and Kajuru Local Governments Areas of Kaduna State, Nigeria. The objective of the study was to assess the socio-economic effects of goat production on the livelihoods of women in the study area. Descriptive statistics and Likert scale were used to analyze the data collected. The study showed that the effects of goat rearing on the level of living of the women in the study area were positive based on increase in savings, income, household food security and household assets. To enhance the potential of goat rearing as a strategy for alleviating poverty in rural communities, concerted efforts should be made by the government and other relevant agencies to raise awareness of recommended practices on goat production through radio and extension advisory services. Credit facilities in form of young goats, high quality feed materials and veterinary drugs should be made accessible to women involved in goat production to encourage the adoption of recommended practices on goat production for increased productivity and better level of living.

Ojo, Omokore, Auta, Damisa, and Hiikyaa (2016) investigated determinants of poverty among women beekeepers' in Kaduna State. 128 respondents were randomly selected out of 256 women beekeepers from Beekeeping Extension Society (BES), Kaduna State. Structured questionnaire and interview schedule was used for data collection. Descriptive statistics, Mean Per Capita household Income and logit regression analysis were used to analyze the data collected. Findings revealed that 96% of beekeepers were in their active age with mean beekeeping experience of 8.8 years. Majority of the beekeepers (86%) had few hives of 2-20. Only 6% of the beekeepers had access to credit while 21% of them had access to extension visits. Mean Per household Income revealed that 48% of the beekeepers were poor while logit regression analysis established that age, beekeeping experience, number of hives, household size, number of dependents, cooperative, extension visits and re-training were the determinant of poverty. Theft, bush burning, pest and predators were some of the major problems militating against beekeeping in the study area. Based on the findings of this study, BES should encourage beekeepers to control bush burning by fire tracing; control pest and Predator with salt solution or spent engine oil;

so that increase in number of hives will increase output and invariably make beekeeping a better poverty alleviation strategy.

**Methodology**

This section deals with the methodology used for this research. The choice of methodology was guided by the desire to attain the objectives and hypothesis of the study. The study focused on impact of entrepreneurship on poverty reduction among women entrepreneurs in Kaduna metropolis. This section therefore focuses on the selection of the population size to be used for the study, methods of data collection and techniques for data analysis.

**Study Area**

Kaduna state is the successor to the old Northern Region of Nigeria, which had its capital at Kaduna. In 1967 this was split up into six states, one of which was the North-Central State, which was changed to Kaduna State in 1976. The state is located in the North-west geopolitical zone of Nigeria, which is one of the 36 states of Nigeria with its capital in Kaduna city. The paper is going to be centered on Kaduna metropolis. Kaduna was selected on the basis that it serves as a gateway to the north and most of the population of Kaduna is made up of various ethnic groups of Nigeria.

**Population and Sample Size of the Study**

The study concentrates on only five forms of businesses and based on this assumption, the population of each of them was arrived at, from their various associations’ register of membership. These businesses are packaging (table water), trading (market women), fashion (tailoring), farming (poultry), and beauty (hairdressing) with population of 650, 5000, 540, 356 and 1000 respectively giving a grand total of 7546. The Krejcie and Morgan (1970) Sample size

determination table was used to determine the sample size for this study.

Sample size formula for arriving at a finite population is;

Where;

S = required sample size

X = z value (e.g. 1.96 for 95% confidence level)

N = population size

P = population proportion (expressed in decimal) (assumed to be 0.5) 50%

.d = degree of accuracy (5%) expressed as a portion (0.5); it is margin of error.

Proportional allocation was done for each stratum (Business and Local Government area) using ratio and thus ensuring that each stratum was appropriately represented. The Bowley (1926) proportional formula was used, which is given as:

$$N_h = n \times \frac{N_h}{N}$$

Where:

$n_h$  = Sample size for stratum h

$N_h$  = Population size for stratum h

$N$  = Total population size

$n$  = computed sample size

**Sampling Technique**

In this research study, a multi stage sampling technique was employed. In the first stage, the state is divided into the three (3) senatorial zones (Kaduna North, Kaduna central, and Kaduna South senatorial zones). In the second stage, Kaduna Central is selected. In the third stage, Kaduna metropolis is selected, which comprises of four (4) local governments. (Kaduna North, Kaduna South, Chukun, and Igabi). Questionnaires were proportionally distributed across the four local government Areas respectively.

**Table 1 Sample Size**

Businesses	Kaduna North/population	Kaduna North/sample size	Kaduna South/population	Kaduna south/ sample	Igabi local/population	Igabi/ sample size	Chikun/population	Chikun/sample size	TOTAL	Total (sampling)
<b>P o u l t r y</b>	1 2 3	5	1 0 6	5	7 1	3	5 6 3	3	3 5 6	1 7
<b>Table water</b>	2 3 9	1 2	1 8 3	9	1 3 3	6	9 5 5	5	6 5 0	3 2
<b>Hair Dressers</b>	3 0 1	1 5	3 3 5	1 6	2 0 0	1 0	1 6 4 8	8	1000	4 9
<b>Petty Traders</b>	1 8 0 1	8 7	1 3 0 7	6 3	8 5 5	4 2	1 0 3 7 5 0	0	5000	2 4 2
<b>T a i l o r s</b>	1 2 6	6	1 7 5	9	1 2 1	6	1 1 8 6	6	5 4 0	2 7
<b>T O T A L</b>	<b>2 5 9 0</b>	<b>1 2 6</b>	<b>2 1 0 6</b>	<b>1 0 2</b>	<b>1 3 8 0</b>	<b>6 7</b>	<b>1 4 7 0 7 2</b>	<b>2</b>	<b>7,546</b>	<b>3 6 7</b>

Source: Author’s computation, 2018

**Method of Data Collection**

The sources of data for this study were primary sources. The method of collecting data that was used is the survey questionnaire as the instrument for data collection. The questionnaire contains structured questions relating to the study variables; Capacity, Awareness, Empowerment, Skill, Education and so forth. The information will be

used to find the relationship between the variables of the study. Furthermore, Hassan (2013) questionnaires was adapted and modified to measure women empowerment and employment generation.

**Reliability Test of the Instruments**

The reliability of research instruments is a necessary condition to obtain good and qualitative results in order to draw valid conclusion. The study uses Cronbach’s Alpha to see if the instruments have high degree of reliability. From the result

obtained below the value of Cronbach’s alpha is 0.760 > 0.600 based on the basis of decision making the study has concluded that the instruments are reliable and have passed the reliability test.

**Table 2 Reliability Statistics**

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.760	.750	5

Source: Author’s computation, 2018

**Model Specification**

The mathematical model of Foster, Greer and Thorbecke was used to achieve objective of the study. Using the mathematical model developed by Foster, Greer and Thorbecke (1984) for poverty

measurement, the model will be of great important to ascertain the level of poverty by the women entrepreneur whether they are above the poverty line despite their engagement in business activities. Therefore, the model can be specified as:

$$P_{\alpha} = \dots\dots\dots (1)$$

Where:

- P = Poverty
- yp = Poverty line
- yi = average income of respondents household (N)
- H = Number of household below the poverty line
- N = Total number of household
- α = Foster, Greer and Thorbecke (FGT) Index which takes the values 0, 1, 2.

From the model in equation (1) the following indices or measures could be Obtained:

(a) Head Count Ratio: This index measures the proportion of the population that are classified as poor. If alpha value equal to zero (α = 0) from equation (1) the poverty index becomes:

$$P = \dots\dots\dots (2)$$

(b) Poverty Depth (Gap): This index measure the extent of poverty as it reflects the distance the poor are from the poverty line. If alpha value equal to

one (α=1) from equation (1) the poverty index becomes:

$$P_1 = \dots\dots\dots (3)$$

(c) Severity of Poverty Index: This is the mean of the squared proportion of poverty gap. If alpha

value equal to two (α = 2) from equation (1) the poverty index becomes:

$$P_2 = \dots\dots\dots (4)$$

**Results and Discussion**

**Table 3: Foster, Greer and Thorbeck (FGT) Mathematical Measurement of Poverty for Women Entrepreneur.**

TIPWEE	MWEIP	P	L	H	C	R	P	G	R	P	D	P	S
421,162.94	1,147.58	382.52		0.52			0.11			0.05		0.03	

Source: Author’s computation, 2018

Where: TIPWEE= Total income per woman entrepreneur equivalent monthly: this was arrived by dividing each woman entrepreneur income by the household size raised to the power of 0.7 being equivalent scale expressed as INCM/n<sup>0.7</sup>. The income per woman entrepreneur was summed up below.

Total Income per household equivalent = ₦ 421,162.94

Poverty line = (MWEI)  
 =(₦ 1,147.58) = 382.52  
**Poverty line = ₦ 382.52**

From the result above, the study finds out that the women entrepreneurs’ average monthly income during the business is ₦ 1,147.58

Total income of poor = ₦421,162.94  
 Average income of poor = ₦339.726

**Mean Women Entrepreneur Income (MWEI)**

$$MWEI = ₦1,147.58$$

**Poverty line (PL)**

**Headcount ratio (HCR)**

$$HCR = 0.52$$

$$= 52\%$$

The Head count ratio (HCR) is the proportion of a population that exists, or lives, below the poverty line or cannot afford to buy the basic basket of food. The study reveals that 52% are below poverty line in the study area.

#### Poverty gap ratio (PGR)

$$\text{PGR} = 0.111 = 11\%$$

The above finding shows the poverty gap ratio of the average shortfall of the total population of women entrepreneurs in the study area.

#### Poverty Depth (PD) = HCR X PGR

$$= 0.111 \times 0.523 = 0.058 \\ \approx 6\%$$

The poverty gap index is an improvement over the poverty measure headcount ratio which simply counts all the people below a poverty line, in a given population 6 percent of the income is required to bring the women entrepreneurs that are poor up to the poverty lines.

$$\text{Poverty Severity (PS)} = \text{HCR} \times (\text{PGR})^2 \\ = 0.111 \times (0.523)^2 \\ = 0.03 \\ = 3\%$$

Poverty severity among the women entrepreneurs is 3% percent. This simply means that the 1.3 percent is the poor among poor.

In estimating the poverty indices, the study measures the well-being of the women entrepreneurs by their total average income and by the size of their households using the adult equivalent scale. Haven established the individual member of the household consumption expenditure, one-third ( $\frac{1}{3}$ ) of the mean consumption expenditure of the whole sample under study is used to establish poverty line according OECD, whereas, the international poverty standard of 1.9\$ per day was also used to ascertain the poverty line. The poverty measures as

#### References

- Adeleye, O., Alli-Balogun, J. K., Afimo, O. G., & Bako, S. (2016). Effects of goat production on the livelihood of women in Igabi, Chikun and Kajuru Local Government Areas, Kaduna State, Nigeria. *Asian Journal of Agricultural Extension, Economics & Sociology*, 11(1) 1 - 8. DOI: 10.9734/AJAEES/2016/22194
- Anyanwu, J. C. (2010). Poverty in Nigeria: A gendered analysis. *African Statistical Journal*, 11. Retrieved from,

indicated in Table 3 reveals that 52% of the women entrepreneurs out of the 367 sample of women entrepreneurs are living below the poverty line, while 48% of women entrepreneurs are above the poverty line. The poverty head count, depth and severity are, 0.52, 0.058 and 0.03 respectively. This means that 52% of the sample women entrepreneurs lived below the poverty line of ₦579.5 per day, while 6% of the income is required to bring women entrepreneurs that are poor up to the poverty line. The poorest households accounted for 3% of the women entrepreneurs. Therefore, findings of the study are in line with the works of Taiwo, Agwu, Adetiloye and Afolabi (2016), which confirms that women participation in businesses has generated employment and reduction in poverty. On the other hand the study does not agree with the work of Anyanwu, which in spite of women participation in businesses, poverty is still on the high side.

#### Conclusion and Recommendations

This study analyses the impact of entrepreneurship on poverty reduction among women entrepreneurs in metropolis, Kaduna state, Nigeria. From the field survey, samples of three hundred and sixty seven women entrepreneurs (367) were randomly selected in four Local Government Areas that includes Kaduna North, Kaduna South, Igabi and Chikun LGAs in Kaduna State.

Therefore, the general conclusion of this study is that entrepreneurship have played an important role in development of Kaduna metropolis by increasing self employment opportunities, create wealth and able to produce goods and services for consumption but has not significantly created jobs for others within the state. Even though the women are entrepreneurial, the still live from hand to mouth, the impact is slow and steady just at a substantial level. The paper recommends that status of women entrepreneurs should be improved through empowerment programs; good policy framework and conducive environment to enable them contribute immensely to development of the state through their active participation in business.

<https://www.afdb.org/fileadmin/uploads/afdb/Documents/Publications>.

- Blau, J. R., & Alba, R. O. (1982). Empowering nets of participation. *Administrative Science Quarterly*, 27(3), 363 – 379.
- Chinonye, O., & Chima, M. (2010). Women entrepreneurship development in Nigeria: The Effect of Environmental Factors
- Fisher, E., Reuber, R., & Dyke, L. A. (1993). Theoretical overview and extension of research on sex, gender and

- entrepreneurship, *Journal of Business Venturing*, 8(2), 151 – 168.
- Ifenkwe, G. E., & Kalu, E. S. (2012). Poverty management among rural women in Bende Local government of Abia State, Nigeria. *International Journal of Academic Research in Business and Social Sciences* 2(8), 323 – 330.
- Igbo, C. A. (2006). *Developing entrepreneurship through entrepreneurship*. In E. U. (ed) Entrepreneurship education and wealth creation strategies, Home Economics Research Association of Nigeria (HERAN).
- Kutanis, R.O., & Bayraktaroglu, S. (2003). Female Entrepreneurs: Social feminist insights for overcoming the barriers stream 19: Gender perspectives and management. CMS 3TurkeySakarya University.
- Maniero, L. A. (1986). Coping with Powerlessness: The relationship of gender and job dependency to empowerment strategy usage. *Administrative Science Quarterly*, 31(4), 633 – 653.
- Mcgregor, D. M. (1960). *The Human side of Enterprise*. New York: Mcgraw-Hill.
- OECD., (2011). Women's economic empowerment. Issue paper. Retrieved from [www.oecd.org/social/gender-development/47561694.pdf](http://www.oecd.org/social/gender-development/47561694.pdf)
- Oladimeji, Y. U. O., Adepoju, S.A., & Abdulsalam, Z. (2015). Reviving pottery enterprise: An impetus to poverty alleviation and self-reliance among women folks in Ilorin, Kwara State, Nigeria. *International Applied Psychology: An International Review*, 51(1), 146 – 169.
- Journal of Development and Sustainability*, 4(2), 145 - 160.
- Ojo, I. H., Omokore, D.F., Auta, S. J., Damisa, M.A., & Hiikyaa, A.N.(2016). Determinants of poverty among women beekeepers in Kaduna State. *Journal of Animal Production Resources*, 28(2). Retrieved from [www.naprijapr.org](http://www.naprijapr.org)
- Onyebueke, C., & Ochojo, S., (2002). The dimension of poverty in Nigeria and the problem of Empowerment. *The Comet* 10(6).
- Sanusi, L. S. (2012). Increasing women's access to finance: challenges and opportunities. Being a paper presented at the Second African Women's Economic Summit held in Lagos, Nigeria prepared by the Research Department of the Central Bank of Nigeria Retrieved from <http://www.bis.org/review/v1208279.pdf>
- Taiwo, J. N., Agwu, M. E., Adetiloye, K. A. & Afolabi, G. T. (2016). Financing women entrepreneurs and employment generation, a case study of microfinance bank. *European Journal of social studies* 52(1), 112 – 141.
- Thomas, K. W., & Velthouse, B. A. (1990). Cognitive elements of empowerment: An interpretive model of intrinsic task motivation. *Academy of Management Review*, 15(4), 666 - 681.
- Wall, T. D., Cordery, J. L., & Clegg, C. W., (2002). Empowerment, performance, and operational uncertainty: A theoretical integration.