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Highlights

High-Density Apple Orchards

Market Access & Farming System

Discovering Thoughts, Inventing Future

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Multivariate Analysis of Agricultural Market Access and Farming System in Tanzania

By Nicholaus E. Nikusekela & Hija W. Mwatawala

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Keywords: agricultural market access, farming system, smallholder.

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MULTIVARIATEANALYSISOFAGRICULTURALMARKETACCESSANDFARMINGSYSTEMINTANZANIA

Strictly as per the compliance and regulations of:

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Nicholaus E. Nikusekela [α] & Hija W. Mwatawala [σ]

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In a conclusive way, local periodic markets have important role in rural development. In economic dimension, the local periodic markets generates jobs and income and therefore decrease poverty levels. In sellers' motivating dimension, the sellers like their work because money and employment are important reasons for working in periodic markets.

Keywords: agricultural market access, farming system, smallholder.

I. Introduction

a) Background

Tanzania economy depends on agriculture, which accounts for more than one-quarter of growth domestict product, it provides 85% of exports, and employs about 75% of the work force. The World Bank, the IMF, and bilateral donors have provided funds to rehabilitate Tanzania's aging economic infrastructure, including rail and port infrastructure that are important trade links for inland countries source. Recent banking reforms have helped increase private-sector growth and investment, and the government has increased spending on agriculture to 7% of its budget. Continued donor assistance and solid macroeconomic policies supported a positive growth rate, despite the world recession as shown in the study by Lokina *et al.* (2011).

To date, however the agricultural sector in Tanzania has contributed little to poverty reduction. Various studies point to numerous reasons for this situation. One of the reasons relates to low natural resource utilisation explained by extremely low land-labour ratios. Despite the abundance of unutilised land, Tanzanian agriculture is dominated by small scale subsistance farming (MAFS, 2001). Smallholders operating between 0.2 and 2 hectares (Tulahi and Hingi, 2006) and traditional livestock helders who keep an average of 50 heads of cattle utilise approximately 85% of the arable land (MAFS, 2001). Tulahi and Hingi (2006) also found that the major limitation on the size and utilisation of land holdings is the lack of access to modern farming methods and heavy reliance on the hand hoe as the main cultivating tool, 70% of farmers still used a hand hoe for tilling the land, 20% used animal draft ploughs and only 10% used tractors.

The second reason relates to low productivity in the sector. Not only are farmers cultivating small plots of land, but yields are low relative to countries with similar natural resource endowments and climatic conditions, indicating inefficient use of the land available. A historical prolonged and deep urban bias led to a distorted pattern of investment. Greater public and private capital was invested in urban areas than in rural areas, with too little capital directed towards raising rural productivity, such distortions have resulted in strikingly different marginal productivities of capital in urban and rural areas (Mnenwa and Maliti, 2010).

For decades, agriculture in developing countries including Tanzania has operated in a context of low global prices for food products coupled, in many countries, with unfavourable domestic environments. Low levels of investment in agriculture, inappropriate policies, thin and uncompetitive markets, weak rural infrastructure, inadequate production and financial services, and a deteriorating natural resource base have all contributed to creating environment in which it has frequently been risky and unprofitable for smallholders to participate in agricultural markets (Eskola, 2005).

Strong links to markets for poor rural producers are essential to increasing agricultural production, generating economic growth in rural areas and reducing hunger and poverty. Improving these links creates a virtuous circle by boosting productivity, increasing

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incomes and strengthening food security. Better access by small producers to domestic and international markets means that they can reliably sell more produce at higher prices. This in turn encourages farmers to invest in their own businesses and increase the quantity and quality of the goods they produce (Elkington, 2008).

For these reasons, improved market access is not an issue of consequence only to better-off producers, and it is not relevant only to cash crop, rather than food crop, production. It is of importance to all rural households, and assisting rural poor people in improving their access to markets must be a critical element of any strategy to enable them to enhance their food security and increase their income (Elkington, 2008).

Rural incomes will not be substantially increased by exclusive emphasis on subsistence food crop production; rather, more market-oriented production systems are needed. These require the intensification of agricultural production systems, increased commercialization and specialization in higher-value crops. And these must be built upon the establishment of efficient and well-functioning markets and trade systems – ones that keep transaction costs low minimize risk and extend information to all players, and that do not either exclude, or work contrary to the interests of, the poor – particularly those living in areas of marginal productivity and weak infrastructure (Gardner and Brooks, 1994).

b) Problem statement and justification

Given the predominant role of agriculture in the livelihoods of most Tanzanians, any strategy for slashing poverty and hunger in the country must center on rapid growth in the agricultural sector. Farmers clearly need the government to make investments aimed at increasing agricultural productivity. These investments depress commodity prices and farm incomes if they are not linked to market opportunities for farmers. Poorly functioning markets, weak domestic demand, and lack of export possibilities are major constraints on farmers' agricultural growth prospects.

Lokina *et al.* (2011) examine the role of agriculture, and in particular smallholder farming, in economic growth and poverty reduction in Tanzania in the 1990s and 2000s, majority of Tanzanians earned their living from farming over this period, and the relative poverty of farm households compared to non-farm households actually worsened. Household survey data from 1991 to 2007 reveals that occupational shifts away from the agriculture sector made a larger contribution to overall growth than did income growth within agriculture.

It is of this sense this study addressed the agricultural market access and farming systems with specific local contexts, namely small and medium towns in Msalato, Makutupora and Hombolo. From the policy standpoint, the problem of balanced market growth and farming systems among the smallholder farmers cannot be dissociated, a fortiori within the context of global and national economic integration.

c) Research questions/hypothesis

i. What are the farming systems that influence poverty reduction in smallholder farmers in Dodoma city?
ii. What is the relationship between access to periodic market and criteria determining agricultural marketing in Dodoma city?

This study tested the following hypothesis;

Hypothesis (H_0): There is no significance relationship between access to periodic market and criteria determining agricultural marketing in Dodoma city.

d) The theory of periodic markets/periodic marketing

i. *The location theory*

Periodic markets are mostly rural because wherever we have periodic markets in urban centers these markets also act as daily ones. For example Veyula market in Makutupora ward which is still used as periodic market is also a daily market; the only difference is that there will be more people from different villages and towns and a variety of goods on a market day. Rural periodic market came into being as a result of the organization of rural markets. Some markets are located in the vicinity of the palace such as Veyula market in Makutupora ward and Hombolo- Bwawani market in Hombolo ward, while some are strategically located in the centre of the community like Msalato market, others are sited on neighbourhood basis as in Hombolo- Makulu in Hombolo ward.

Contribution to the theory of periodic markets and mobile trading can be placed in either an economic or a non-economic tradition. The non-economic emphasis tends to view periodic marketing as a social phenomenon. This is supported by Bromley and Good (1977) that markets are held periodically to coincide with existing periodic institution and that local traders and consumers who are usually producers could not go to market at anytime but have chosen to trade on a traditional rest day or on a day when they were accustomed to converge upon a central place for social and religious activities or to hear proclamations and pay tribute to or receive alms from local authorities. The economic tradition includes two distinct themes, the one steaming from a central place theory interpretation of periodic marketing, the other from the location theory. In both of these, periodic markets and marketing are distinctively economic phenomena with a concern for exchange for profit rational economic behavior.

This is also noted by Hay (1971) that the decision to adopt periodic marketing may have one of three intentions: to achieve viability, to increase excess profits and to lower retail prices or raise producer prices as a move to forestall competition. According to Hay

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(1971) periodic marketing" is an attempt to achieve these aims by reducing the total over head costs which must be covered at a single market place. The first attempt at a theory of periodic markets was contributed by Stine (1969) using the Korean markets. He analyzed periodic markets in terms of central place theory and specifically in terms of minimum and maximum ranges. He then analyzed the distance people are ready to go to obtain a good, how settlements are distributed over space and the tributary or market area, the bigger the settlement, the more the tributary area, but will have area of smaller, tributary nesting within that of a bigger settlement. The minimum range of goods indicates the radius of a circle encompassing the level of demand actually required for a firm to realize profit from offering a central good. The maximum range represents the farthest distance dispersed consumers are willing to travel to purchase a good at a central place. Stine (1969) argues that when the maximum range of a good is greater than or equal to the minimum range the firm will survive and be immobile (fixed).

By contrast if the minimum range of a good is greater than the maximum distance a consumer is willing to travel the firm will either die out, become periodic but remain spatially fixed or become spatially mobile and move among a given series of location or market sites according to a re-established temporal pattern. Furthermore as the degree of mobility increases the difference between these two ranges become greater. The outcome is a mechanism that intensifies exchange in place and time there enabling traders and marketers to attain minimum range (that is survival threshold) for their products.

Stine (1969) argues that the two ranges vary with income density, elasticity of demand and transport cost. But also said that markets are open only once every few days because the per capital demand for the goods sold in the market is low and high transport limit the extent of the market and the aggregate demand is therefore insufficient to support permanent sellers. For the consumers also marketing periodicity lessens the physical distance between him and the goods and services he desires. The issue of transportation is also important because if the cost of purchasing a good is included with transportation as the cost increases there will be a situation whereby people will not want to purchase in the area again, there will have to be an alternative good or another location where goods can be purchased without additional transport cost. A trader that wants to sell more than his competitor must not, therefore let his price exceed his competitors even after the transport cost has been added (Hotelling, 1929).

Apart from Stine's theory, rural markets are also periodic because it is labour intensive, there might not be enough goods to sell if the markets were to meet everyday. Also the market is characterized by low level of specialization; individuals generally perform the role of producing and marketing. In this case time is needed for them to be able to perform both functions. Abayomi (2008) added that in many rural areas of Nigeria especially in Ondo state the common type of market is the periodic market which specializes in the subsistence goods trading. This is to enable households goods get to individual on periodic basis usually every four days.

ii. *The central place theory*

Much of the analysis of marketing functions of cities may be said to be rooted in this theory. The theory postulated by Christaller (1933) made some assumptions. Based on these assumptions Christaller believes that an urban centre exists mainly to provide goods and services for the surrounding areas. Such centers are usually located at the point of minimum aggregate travel of the tributary area and are hence called "central places" the tributary area which is assumed to be hexagonal in shape (six-sided polygon) varies in size according to how large the central place is. The larger the central place the more extensive its tributary area is. In addition higher-order center provide more goods and services than lower order ones.

II. Materials and Methods

a) Study area

This paper is based on a study conducted in 2014 under the title "*Analysis of market decentralization and its effects on poverty reduction"* taking periodic markets in Dodoma city as a case study in three wards of Msalato, Makutupora and Hombolo. The study areas were selected because they host large periodic markets in Dodoma city.

Dodoma city is located in the middle of the country. It is boarded by Chamwino district in the East and Bahi district in the West. It lies between Latitudes 6.00^0 and 6.30^0 South, and Longitude 35.30^0 and 36.02^0 East. The city covers an area of 2,769 square kms. It is characterized with both Urban and rural qualities. It stands on broad upland plateau with an altitude ranging between 900-1000 meters above sea level, with beautiful stony hills such as Image, Isanga, Mkalama and Mlimwa. It experiences a long draught and short rainfall seasons. Due to unreliable rainfall, the area has scanty vegetation such as shrubs, grasses as well as conspicuous baobab and acacias trees. The climate of Dodoma is semi-arid, characterized by a marked seasonal rainfall distribution with a long dry and short wet seasons, an average annual rainfall of about 550 – 600mm per year, which falls between December and April each year.

The city has moderate drainage soils with Savannah type of vegetation mainly dominated by Baobab trees and Acacia wood lands. The average temperature varies from 20^0C in July to 30^0C in November each year. There are seasonal rivers, deep and shallow wells including dams in few villages.

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Dodoma city is administratively divided into one parliamentary constituency, 4 divisions, 37 wards, 39 villages, 100 mitaa and 222 hamlets. While the original inhabitants of the city are believed to be the Gogo and Rangi, but there are now a quite good number of mixed tribes from neighboring regions; this is due to trade and cultural relationships in the area.

b) Data collection methods and tools

This study used a triangulation method whereby data from the same sample in the study area were collected using different techniques including; households' heads interview using questionnaires, key informant interviews, and neighbourhood observations. A document review also formed part of the data collection methods. Under this method various published and non published articles related to decentralization and agricultural marketing were reviewed. A questionnaire was designed as a tool for primary data collection. The questionnaire was designed in order to collect both qualitative and quantitative data as indicated by Leedy and Ormrod, 2004. The questionnaire was then administered to respondents (smallholder farmers household heads) and key informats such as WEOs, VEOs, councillors and harmlet/village chairperson. However, face-to-face interviews were also administered because they have several advantages over the other methods. According to Bless and Smith (2000), an interviewer administered interview is an important tool of data collection because it reduces omission of difficult questions by respondents. In addition, it reduces the problem of word or question misinterpretation (misunderstandings) by respondents and was administered to peasants households who can neither read nor write (Leedy and Ormrod, 2004). The heads of the households for the families chosen to be part of the sample were interviewed. In the absence of the head, the spouse or any family member who is directly involved in the farming activities and management was interviewed. The main respondent provided most of the information, but was allowed to consult other household members where necessary. The rationale for the use of these instruments in data collection methods was to minimize the short comings of using only one instrument hence using a variety of instruments to collect data was to utilize the advantages associated with triangulation.

c) Research design

This study used a cross-sectional design. Cross- sectional survey design allows collection of information at one point in time (Casley and Kumar, 1988). The preference was to cross section survey design as opposed to longitudinal survey design which involve trend studies is the convenience of the period allocated for the study. The study was designed to identify the way in which local government authorities (LGAs) facilitate open periodic markets to provide good price to smallholder farmers households and to show how farming systems influency poverty reduction. The study used a sample of 279 households which was obtained by probability sampling (stratified sampling). The study employed multistage sampling, purposeful and randomly sampling techniques. The sampling procedure started with purposefully sampling (Regnard, 2013: Rwegoshora, 2006), Where one district out of seven in Dodoma region were selected. The second stage also involved purposively sampling to select three wards from the district; this was followed by random sampling to select two *mitaa* in each ward. The creteria for selecting the ward were based on the presence of open periodic markets. The third stage involved random selection of representative households from the selected mitaa (Regnard, 2013; Rwegoshora, 2006). Also key informants were selected purposevely.

d) Data analysis

The collected data were analysed qualitatively and quantitatively. A quantitative analysis (multivariate analysis) examined agricultural market accessibility in smallholder farmers households and a qualitative analysis (multiple response) scoring method was used in assessing the farming systems in smallholder farmers that have influence in poverty reduction in smallhorder farming households in three wards (Msalato, Makutupora and Hombolo) in Dodoma city.

e) Model specification

A set theoretical definition of periodic market system as shown by Wanmali (1978) on the study *"Periodic Markets in South Bihar"* is as follows:

Let M be a set of periodic markets, $M=\{m_k|k \in K\}$. $M_i \subseteq M$ is a periodic market if:

i. At least one trader of each type visits each market of M_i every week.

ii. There exists a market $m \in M_i$ such that more than x percent of the traders visiting the markets of M_i are based in this market. For x > 50%, this shared base is unique and will be called the center of the periodic market system.

An aggregation of periodic market systems is a set of periodic market systems M = $\{M_i \mid i \in I\}$ for some index set I, satisfying the following conditions:

iii. For all $M_i \in$ M there exists at least one $M_j \in$ M such that:

$$M_i \cap M_j \neq \Phi$$

iv. Let M be partitioned into any two sets M' and M" such that M' ∩ M" = Φ

$$\text{and } M' \cup M'' = M$$

For any two sets:

$$(\cup_{M_i \in M'} M_i) \cap (\cup_{M_j \in M''} M_j) \neq \Phi$$

An aggregate system of periodic markets M is said to cover the set of markets M if:

v. $m \in M$ implies there exists $M_i \in$ M with $m \in M_i$

Let M^* be the universal set of all periodic markets, and M* be the universal set of all periodic market systems. An aggregate system of periodic markets M that covers a set of markets M is closed if:

vi. $m \in M$ and $m \in M_i \in$ M* then $M_i \in$ M

Although (iii) above is a consequence of (iv) it has been included for emphasis, since in any aggregation of periodic markets there will always be a pair-wise intersecting sequence of periodic market systems between any two market systems in the aggregate. Wanmali's original aggregate system in the study *"Periodic Markets in South Bihar"* does not cover the set of markets studied in Dodoma city in three wards of Msalato, Makutopora and Hombolo, and it is not closed.

The probability to access periodic market in the study area are estimated as follows:

$$P(A_{i,t}>0) = \beta_0 + \beta_1(PROD) + \beta_2(MARKX) + \beta_3(INFRS) + \varepsilon_i$$

In above equation the dependent variable $P(A_{i,t}>0)$ denotes the probability that the smallholder farmers household access to periodic market *A* greater than zero. The dependent variable $A_{i,t}$ denotes the infrastructure provides by LGAs to a client *i* who need to reach the market in time *t*. β_0 is a constant, β_1, β_2, and β_3 are parameter vectors and ε_i denote distributed error terms with a mean of zero and a variance σ^2.

Where;

PROD= Production level

MARKX= Marketing mix i.e processing, packaging, promotion, and standardization

INFRS = Infrastructures i.e transportation facilities, road networks

III. Results

a) Farming system and its influence on poverty reduction

The first aim of this study was to examine the farming related factors and systems that influence poverty reduction in smallholder farmers households. To address this objective a multiple response analysis was used. Most households in the study area practiced mixed farming. This system is an agrarian system that mixes crop farming with the raising of livestock. For example, the same farm may grow cereal crops, and keep cattle, sheep, pigs or poultry. Often the manure especially from cattle is used to fertilize the cereal crops.

Table 1 presents the pattern of poverty in relation to farming system in study area. The figure shows that the propotion of households that were categorised as "poor" and "rich" varied with farming systems. The households practising both crop and livestock systems had the largest (79.4%) proportion of "rich" households while the households practising crop only farming system had the smallest (20.6%) proportion of "rich" households. Also the household in poor category were practising combination of crops and livestock (72.7%) as compared to only 27.3% for crops only as a farming practice. Mixed farming is the dominant system in Msalato, Makutupora and Hombolo wards of Dodoma city where most farms have a mixture of fields and pastures.

Table 1: Farming systems and poverty level in the study area

Category	Farming systems				Total	
	Crops only (Frequency)	%	Crops & livestock (Frequency)	%	Frequency	%
Rich	37	20.6	143	79.4	180	64.5
Poor	27	27.3	72	72.7	99	35.5
Total	64	22.9	215	77.1	279	100

Source: Survey data, 2019

Although the poverty rate varies substantially from one farming systems to another approximately 64.5% of all households fell into the "rich" household category and the rest 35.5% fell into "poor" category. Since poverty is predominsntly a rural phenomenon and agriculture is a major economic activity for rural population, it follows that the level of poverty found in rural areas can in no way be dissociated from the over-dependence of the smallholder farmers in agriculture. In this area there are more rich people than poor people. The results is evidenced by Kisusu (2003) on his study which concluded that introduction of different breeds of improved dairy cattle and improved rice varieties had a positive impact on household income and food security and significantly contributed to poverty reduction at the household level.

There is inequality between different groups in society. The gap between the rich and poor is significant. Although Dodoma city puts much emphasis on poverty alleviation by tricking down the macroeconomic gains from different development partners to the community level so as to realize the wellbeing of the city dwellers even though the poverty rate in Dodoma city is estimated to be 25% (URT, 2011).

b) Access to periodic market by smallholder farmers households

The second aim of the study was to determine the relationships between access to periodic market and criteria determining agricultural marketing. To address this objective a regression analysis was carried out. The results shows that lack of access to markets - whether due to poor infrastructure or productivity, limited education, or insufficient information - prevents access to both labor and capital. In many rural societies, there are few job opportunities outside of agriculture, often resulting in food and income insecurity due to the precarious nature of farming. Rural workers are largely concentrated in jobs such as owners-cultivators, tenant farmers, sharecroppers, informal care workers, agricultural day-laborers, and livestock herders.

Table 2 presents the results of the regression analysis. The accessibility criteria including production only; marketing mix only with dummy variable of processing, packaging, promotion, transport and standardization found to be insignificant while the combination of both infrastructure, production and marketing mix found to be significant at confidence interval of 99% or significant level of 1% which means that $p < 0.01$. The data further shows that infrastructure criteria, marketing mix only and a combination of both infrastructure, production and marketing mix had a negative relationship with access to periodic market, while production have a positive relationship. This implies that households will not be able to access periodic market without good infrastructures and marketing mix for the products regardless how much they have produced in that season.

The data generally shows that coefficient of correlation, R^2 to be 0.80, adjusted $R^2 = 0.797$ and F-distribution ($F= 273.727$) which means that there is a perfect fit for the criteria to access periodic market as explained by the regression equation. The issue of transportation is also important because if the cost of purchasing a good is included with transportation as the cost increases there will be a situation whereby people will not want to purchase in the area again, there will have to use an alternative good or another location where goods can be purchased without additional transport cost.

Table 2: Multivariate analysis of households to access periodic market in relation to marketing determinant factors

Independent variables	B	Std. Error	Beta	T	Sig.	
Constant	1.000	0.128		7.827	0.000	
Infrastructure only (i.e. roads, market shed)	-0.082	0.131	-0.069	-0.626	0.532	
Production only	-8.614E-14	0.130	0.000	0.000	1.000	
Marketing mix only (i.e. processing, promotion, packaging, standardization, transport)	-0.237	0.133	-0.166	-1.785	0.075	
Combination of both infrastructure, production and marketing mix	-0.980	0.130	-0.959	-7.558	0.000	*

$R = 0.894$, $R^2 = 0.80$, Adjusted $R^2 = 0.797$ and $F = 273.727$

a. *Dependent Variable: Whether household can access or not access market*

b. ** indicate siginificance at 1%*

While marketing criteria pose challenges and opportunities for smallholder farmers households, they are not the only criteria which are responsible for market accessibility. Other factors such as the government policies, technology advancement and intensive capital play a very big role in influencing the accessibility of periodic market. In areas where these criteria are not well addressed it is likely that poverty levels will be higher due to inefficiency market accessibility.

IV. Conclusion and Recommendations

a) Conclusion

This study shows that the local periodic markets have important role in rural development. In social and cultural dimension, they effect on villagers' social situation, help women empowerment, increase interaction between cities and villages and identify local traditions to visitors. In economic dimension, the local periodic markets produce jobs, income, decrease poverty and help to sale crops. In sellers' motivating dimension, the sellers like their work but jobs, money and employment are important reasons for working in the market.

Farming systems in Dodoma city is highly intensified towards crop production and livestock keeping, associated with diversification of diet, meeting the changing domestic market demand and increasing the export potential. The resultant diversification which is due to favourable agro-climatic conditions suitable for cultivation of a wide range of cereals and livestock keeping, offers a higher income-generating strategy to a large number of marginal farmers of the region.

b) Recommendations

However, to actualize these market access opportunities, reforms have to be brought in agriculture sector to remove all barriers, whether legal or policy induced, which introduce inefficiencies and monopoly trends in the functioning of agricultural markets. Multiple restrictions have not only cascading effect and the prices but also sets a barrier to free flow of materials from farm to the factory and ultimately to the consumers. All these controls are now widely recognized as going against marketing and processing efficiencies. In the present situation these restrictions are acting as a disincentive to farmers trade and industries. Also smallholder farmers should diversify farming because diversified farming also contributes to improved human and livestock nutrition with the inclusion of vegetables, fruits and other micro-nutrient rich foods and fee.

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Analyse du Comportement du Consommateur du Carburant-Essence au Cameroun: Examen du Cas de la Ville de Maroua

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Abstract- The presence of violence (or terrorism) caused by the terrorist sect Boko Haram prompted the Nigerian Government to proceed with the closure of its border with the northern part of Cameroon. This decision caused the rise in the price of adulterated fuel commonly known as "zoua zoua" in the local dialect, which represents about 75% of the market for fuel consumed in the northern part of Cameroon. In this context, the main objective of this study is to analyze the behavior and sensitivity of the fuel-gasoline consumer in the city of Maroua. The data used for this study come from a survey carried out by means of a questionnaire among 300 motorists with engines consuming only gasoline in the city of Maroua during the month of July 2019. This choice is justified by the 'unavailability of aggregate data on the volumes of fuel consumed in the city of Maroua and the concern to guarantee the size of the target sample. To construct the sample, the study used the non-random sampling method, in this case the quota method. Comparison of means tests on independent samples are used on cross-sectional data. The results of the estimations obtained on primary data show that, ceteris paribus, the consumer turns to the informal sector and only turns away from it when the price of adulterated gasoline increases.

Keywords: *consumer, fuel-gasoline, means comparison tests, city of maroua.*

GJHSS-E Classification: *FOR Code: 340299p*

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Analyse du Comportement du Consommateur du Carburant-Essence au Cameroun: Examen du Cas de la Ville de Maroua

Mohamadou Oumarou $^{\alpha}$ & Faycal Aminou $^{\sigma}$

Résumé- La présence de la violence (ou terrorisme) causé par la secte terroriste Boko Haram a incité le Gouvernement Nigérian à procéder à la fermeture de sa frontière avec la partie septentrionale du Cameroun. Cette décision a provoqué la hausse du prix du carburant frelaté communément appelé «zoua zoua» en dialecte local, qui représente environ 75% du marché du carburant consommé dans la partie septentrionale du Cameroun. Dans ce contexte, cette étude se donne pour objectif principal d'analyser le comportement et la sensibilité du consommateur du carburant-essence dans la ville de Maroua. Les données ayant servi à cette étude proviennent d'une enquête réalisée au moyen d'un questionnaire auprès de 300 automobilistes ayant des moteurs consommant uniquement de l'essence dans la ville de Maroua durant le mois de juillet 2019. Ce choix est justifié par l'indisponibilité des données agrégées sur les volumes de carburant consommées dans la ville de Maroua et par la préoccupation de garantir la taille de l'échantillon visée. Pour construire l'échantillon, l'étude a fait recours à la méthode de sondage non aléatoire en l'occurrence la méthode des quotas. Les tests de comparaison des moyennes sur des échantillons indépendants sont utilisés sur des données en coupe transversale. Les résultats des estimations obtenus sur des données primaires montrent que, *ceteris paribus,* le consommateur est tourné vers l'informel et ne s'en détourne que lorsque le prix de l'essence frelaté augmente. Comme mesure de politique économique, des efforts devraient être faits pour l'assainissement et l'organisation du secteur informel de vente de carburant-essence.

Mots clés: consommateur, carburant-essence, tests de comparaison des moyennes, ville de maroua.

Abstract- The presence of violence (or terrorism) caused by the terrorist sect Boko Haram prompted the Nigerian Government to proceed with the closure of its border with the northern part of Cameroon. This decision caused the rise in the price of adulterated fuel commonly known as "zoua zoua" in the local dialect, which represents about 75% of the market for fuel consumed in the northern part of Cameroon. In this context, the main objective of this study is to analyze the behavior and sensitivity of the fuel-gasoline consumer in the city of Maroua. The data used for this study come from a survey carried out by means of a questionnaire among 300 motorists with engines consuming only gasoline in the city of Maroua during the month of July 2019. This choice is justified by the 'unavailability of aggregate data on the volumes of fuel consumed in the city of Maroua and the concern to guarantee the size of the target sample. To construct the sample, the study used the non-random sampling method, in this case the quota method. Comparison of means tests on independent samples are used on cross-sectional data. The results of the estimations obtained on primary data show that, *ceteris paribus*, the consumer turns to the informal sector and only turns away from it when the price of adulterated gasoline increases. As an economic policy measure, efforts should be made to reorganize and organize the informal fuel-gasoline sales sector.

Keywords: consumer, fuel-gasoline, means comparison tests, city of maroua.

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I. Introduction Generale

Dans les quartiers de la ville de Maroua, voir une bouteille ou un bidon disposés négligemment sur le côté de la route, comme des objets abandonnés fait partis des quotidiens de la population. En effet, ces récipients contiennent souvent un liquide plus ou moins transparent. Par ailleurs, c'est une longue perche qui est planté sur le bas-côté, son sommet plongeant dans un entonnoir, dans un bidon ou dans une bouteille retournés. Bien connus de la population en l'occurrence des automobilistes et des motocyclistes, ces signes susmentionnés indiquent les lieux où l'on peut se ravitailler en carburant, en dehors des stations-services de la ville, même si la qualité du produit est sujette à caution. Ce type de carburant est communément appelé «*zoua zoua*». Le marché de vente du carburant dans la ville de Maroua, et à l'instar des nombreux autres marchés pétroliers du Bénin, fait l'objet depuis des nombreuses années d'un parallélisme de distribution des produits pétroliers qui se traduit par la coexistence et le fonctionnement simultané d'un marché officiel incarné par les stations d'essence et d'un marché parallèle caractérisé par les étalages d'essence aux abords des rues (Kiki et *al.* 2016). Les stations-services sont approvisionnées par la Société Camerounaise des Dépôts Pétroliers (SCDP)[1] tandis

[1] Créée le 1er juillet 1979 par l'Etat du Cameroun dans le souci d'assurer la disponibilité des produits pétroliers à travers le pays et favoriser le développement de son économie, la Société Camerounaise des Dépôts Pétroliers est la première et unique société assurant le stockage et la distribution en produits pétroliers sur l'ensemble du territoire national.

que l'essence de contrebande provient du Nigéria voisin.

La vente du carburant frelaté dans la ville de Maroua est surtout due à la longue frontière que le Cameroun partage avec son voisin le Nigéria. Cette frontière longue de 1700km connait une porosité sans pareil. La circulation des marchandises le long de cette frontière terrestre est faite en contrebande. L'approvisionnement en produits de première nécessité et même en produits de luxe sont un moyen, pour certains hommes d'affaire, de blanchir de l'argent en faisant ce commerce de contrebande qui ne profite qu'aux seuls commerçants. Le circuit d'approvisionnement en hydrocarbures du Nigéria est très complexe le long de cette frontière (Eloundou, 2016).

La proximité avec le Nigeria, producteur mondial de pétrole a donc favorisé l'émergence d'un second marché parallèle de distribution d'hydrocarbure, de l'essence en particulier dans la ville de Maroua. D'après John Igue (2008) cité par Eloundou (2016), la vente illicite des produits pétroliers constitue un marché de distribution animé par une multitude d'acteurs dont les importateurs sont constitués de gros calibres du pays et jouissant de très bonnes relations dans la douane et les forces de l'ordre. Dans la ville de Maroua, les grossistes font tapis dans l'ombre concernant le secret du circuit de l'écoulement de carburant frelaté. Ces derniers alimentent le marché pour les petits détaillants. Les acteurs informels occupent toute l'étendue de la ville de Maroua à travers plusieurs points de vente installés aux différents côtés de rue tandis que les stations-services existent mais pas suffisamment ou elles sont fermées.

Bien que le secteur informel de vente des produits pétroliers occupe une part importante dans les ventes totales de carburant dans la ville de Maroua, la question lancinante qu'il incombe de se poser est la suivante: *qu'est-ce qui peut pousser un consommateur à préférer l'un ou l'autre type de carburant dans la ville de Maroua*?

Il s'agit donc d'appréhender le comportement et la sensibilité des automobilistes de la ville de Maroua à la consommation de carburant-essence. Avec la fermeture des frontières du Nigéria voisin, cette étude est d'une importance capitale pour les autorités de la ville de Maroua. En effet, Une bonne réponse à cette préoccupation à partir de la méthode de comparaison des moyennes est susceptible d'apporter des solutions aux autorités locales quant à la maîtrise du secteur informel de vente de carburant-essence dans la ville de Maroua. Par ailleurs, cette étude développe une nouvelle approche dans la détermination des préférences du consommateur. Ce sont là des aspects marquant l'intérêt et l'originalité de la présente recherche.

La suite de l'étude est organisée de la façon suivante. La Section 2 analyse le marché du carburant-essence dans la ville de Maroua. La Section 3 présente la méthodologie de l'étude. Les résultats de l'analyse des données sont présentés dans la Section 4. L'étude se termine par une conclusion et les recommandations de politiques économiques (section 5).

II. L'Analyse Marche du Carburant-Essence Dans la Ville de Maroua

La ville de Maroua présente deux modes de vente des hydrocarbures: le secteur formel et l'informel. Le marché du carburant-essence au Cameroun est assuré par deux types d'acteurs. Il s'agit des acteurs du secteur formel représentés par les stations-service et qui sont approvisionnés par la SCDP, et ceux du secteur informel qui s'approvisionnent chez le voisin nigérian.

a) *Le marché formel de vente du carburant-essence dans la ville de Maroua*

Au Cameroun, c'est la SCDP qui assure l'approvisionnement en produits pétroliers sur toute l'étendue du territoire national. La production pétrolière du Cameroun en 2010 a été d'environ 3,3 millions de tonnes. La société TOTAL Exploration-Production reste le plus gros producteur avec 61% des parts. Cette production poursuit le mouvement de baisse entamé depuis 1985, date du pic pétrolier observé au Cameroun. Entre 2001 et 2010, la production pétrolière du Cameroun a chuté de plus de 40% (SIE-Cameroun, 2016)[2]. De toute la production pétrolière nationale en 2010, seule 12% a été transformée localement par la SONARA (Société Nationale de Raffinage). En effet, la structure du marché et le profil technologique de la SONARA, de type hydroskimming, l'obligent à choisir sur le marché international, des bruts légers appropriés à son outil de raffinage et permettant d'obtenir des produits raffinés exigés sur le marché. Le Cameroun est producteur de pétrole, mais de pétrole lourd que la SONARA n'est pas en mesure de transformer. C'est donc du pétrole plus léger, importé essentiellement du Nigéria et de la Guinée équatoriale, que traite la société de raffinage camerounaise.

Comment sont fixés les prix ? La SONARA a un pouvoir de marché (décideur de prix) compte tenu de sa situation de quasi-monopole (environ 90% du marché intérieur). Les prix sont fixés mensuellement en tenant compte de l'évolution des facteurs clés d'environnement sectoriel. Les prix sortie usine de la SONARA intègrent un ajustement économique qui constitue la marge bénéficiaire de la société. Au prix sorti usine, il faut ajouter la marge bénéficiaire des marketers pour avoir le prix des produits pétroliers à la pompe. Pour soutenir la

[2] Situation Energétique du Cameroun, Rapport 2016.

demande des produits pétroliers, l'Etat, à travers le renoncement aux droits de douanes et à la taxe sur la valeur ajoutée sur les produits mis à la consommation, soutient la SONARA. La proximité du Cameroun avec le voisin nigérian, producteur mondial du pétrole a fait émerger un marché parallèle de vente de carburant.

b) *Le marché parallèle de vente du carburant-essence dans la ville de Maroua*

Il ressort des différentes études que le secteur informel du commerce de l'essence au Cameroun est composé de plusieurs types d'acteurs. On peut citer les exportateurs nigérians, les importateurs camerounais qui sont de hauts responsables de l'appareil politico administratif tant au Nigeria qu'au Cameroun et positionnés tout au début de la chaîne de commercialisation. Il y a aussi les grossistes (intermédiaires et détaillants), les semi-grossistes; les détaillants; et les intermédiaires ou agents d'approvisionnement (les automobilistes, les motards, les piroguiers). On note également que le secteur de l'essence informel est pourvoyeur d'emploi pour les sans- emplois notamment les femmes et les enfants (Ale, 2011).

Selon Courade. (1994), l'essence nigériane, connue au Cameroun sous le nom de «fédéral» ou encore Zoua-Zoua, et au Bénin sous celui de «kpayo» (ce qui n'est pas bon), est sans conteste le principal produit d'exportation illégale du Nigeria vers les pays voisins de la zone franc. Dans d'importantes villes camerounaises (Garoua, Maroua, Kumba, Bamenda, Douala), béninoises (Cotonou), nigériennes (Birni N'Konni, Maradi, Zinder) ou tchadiennes (N'Djamena), le commerce d'essence importée en fraude du Nigeria est très répandu. I1 est d'ailleurs devenu le pilier d'un système bon marché de transport urbain et de marchandises et a permis à une population, essentiellement jeune (ces vendeurs à la sauvette appelés les « koweïtiens »), d'accéder à une source de revenu dans un contexte de raréfaction d'emplois au sein du secteur moderne de l'économie.

Un rapport du FMI[3] (2012) cité par Kiki et *al.* (2016), montre que les prix proposés par le secteur informel de l'essence au Bénin sont en lien direct avec ceux en vigueur sur le marché officiel nigérian de l'essence, qui sont relativement bas à cause des subventions de l'Etat nigérian pour le pétrole. La subvention nigériane favorise fortement les prix concurrentiels de l'essence de contrebande au Bénin. Cette situation donne aux importateurs frauduleux béninois, un avantage concurrentiel de prix sur le marché de l'essence au Bénin car, les entreprises formelles béninoises sont obligées de suivre la structure de « prix de vérité ». La ville de Maroua, très proche du Nigéria n'échappe donc pas à cette réalité. En effet, l'essence de contrebande en provenance du Nigéria est vendue dans la ville de Maroua à un prix bas par rapport au carburant vendu dans les stations-services.

De par son importance dans l'ensemble des flux et en raison de son prix bien inférieur à celui pratiqué dans les pays voisins de la zone franc, l'essence nigériane est une « valeur sûre » du commerce transfrontalier et une pièce maîtresse du système d'échanges permettant au Nigeria de « pomper » des francs CFA. Sans ce produit d'appel, le Nigeria, dont la monnaie nationale n'est pas convertible, ne pourrait s'approvisionner ni en francs CFA, ni, dans les mêmes proportions, en marchandises produites dans la zone franc ou réexportées par certains de ses membres. L'exportation du fédéral réussit ainsi, aux dépens de la zone franc, à alléger la contrainte externe qui pèse sur l'économie nigériane.

III. Methodologie de L'etude

Les données ayant servi à notre étude proviennent d'une enquête réalisée au moyen d'un questionnaire auprès des automobilistes de la ville de Maroua, ayant des moteurs consommant uniquement de l'essence. Ce choix s'est justifié principalement par l'indisponibilité des données agrégées sur les quantités de carburant consommées dans la ville de Maroua, permettant d'estimer la consommation de carburant à partir des modèles en séries temporelles comme c'est le cas pour la majorité des études. L'objectif de cette sous partie est de décrire notre questionnaire, présenter notre plan d'échantillonnage, décliner les choix des variables et présenter les tests de diagnostiques.

a) *Description sommaire de l'élaboration du questionnaire*

L'absence d'une base des données sur les volumes de carburant consommés dans la ville de Maroua nous a conduits à élaborer un questionnaire. L'objectif principal de ce questionnaire est de révéler les préférences des individus par rapport aux deux types de carburants consommés. La construction du questionnaire final se fait généralement en plusieurs phases: construction de la première version du questionnaire, pré-test du questionnaire et le questionnaire final. Après la construction de la première version du questionnaire, une pré- enquête a été menée auprès de 30 automobilistes de la ville de Maroua. Ce test préliminaire n'a révélé aucune ambiguïté ni une mauvaise compréhension des questions par les répondants. Suite à cette étape, aucune modification n'a été apportée à notre questionnaire.

La version finale du questionnaire obtenue à l'issue du processus de test préliminaire et

[3] Fond Monétaire International, est une institution internationale regroupant 189 pays, dont le but est de « promouvoir la coopération monétaire internationale, garantir la stabilité financière, faciliter les échanges internationaux, contribuer à un niveau élevé d'emploi, à la stabilité économique… »

effectivement administrée auprès des automobilistes comporte une vingtaine de questions structurées autour de trois sections complémentaires:

- La première section vise à identifier l'automobile ainsi que le type de carburant consommé. Une série des questions est posée dans le but de savoir quel type d'engin l'individu utilise, quel carburant il consomme et quel est son mode de paiement.
- La deuxième section tend à révéler les préférences du consommateur sur les deux types de carburant suite à une variation des prix. Un scénario qui tente d'analyser l'attitude du consommateur au regard des prix de l'essence d'un secteur à l'autre est proposé aux automobilistes. Pour ce faire, nous avons fixé le prix de l'essence formel à 655 FCFA et varier le prix du carburant Zoua-Zoua de 400 à 675 FCFA.
- Enfin, la troisième section porte sur la collecte du maximum d'informations relatives aux caractéristiques démographiques et socio-économiques de l'enquêté. Ces données ont été d'une grande importance dans l'explication de la consommation de carburant par les automobilistes de la ville de Maroua.

Nous avons dû faire preuve de diplomatie et, parfois, adapter le questionnaire à toutes les catégories socioculturelles pour qu'il soit accessible à tous. A certains moments, l'utilisation de la langue locale s'est avérée nécessaire pour une frange de la population. On note que tous les interviewés ont accepté de répondre très chaleureusement.

b) Plan de l'échantillonnage

Pour mener les enquêtes dans quelques domaines que ce soit, dès lors que le temps et/ou les moyens font défaut, l'on a généralement recours à l'échantillonnage qui a pour but de déterminer une population qui soit représentative de l'ensemble à étudier. Dans notre cas précis, l'ensemble à étudier se compose des automobilistes de la ville de Maroua ayant des moteurs consommant uniquement l'essence. Vu notre incapacité à lister tous les automobilistes de la zone d'étude, nous avons construit notre échantillon en utilisant la méthode de sondage non aléatoire[4], à savoir la méthode des quotas. Dans cette optique, un échantillonnage par quotas selon le sexe et le type d'engin utilisé a été fait. Au total 300 automobilistes ont fait l'objet d'interviews directes en face à face durant le mois de juillet 2019. Ce choix s'est justifié par la préoccupation de réaliser la collecte des données dans un délai réduit et de garantir la taille de l'échantillon visée. Tous les 300 questionnaires ont pu être exploités. La répartition de l'échantillon est décrite dans le tableau 1.

Tableau 1: Répartition de l'échantillon

Type de strate		Echantillon	Total
Genre	Homme	200	300
	Femme	100	
Type d'engin	Moto Voiture	111 189	300

Source: auteurs sur la base de l'enquête.

Sur un total de 300 consommateurs, il apparait qu'il y a 200 hommes et 100 femmes. Les types d'engins utilisés pour la consommation du carburant se répartissent en 111 motos contre 189 voitures.

c) Choix des variables

Les variables utilisées dans les estimations sont inspirées de la littérature et concernent essentiellement:

La consommation du carburant-essence (CONSO): C'est le volume mensuel du carburant- essence consommé par un individu dans la ville de Maroua durant la période de l'enquête.[4] Cette variable a été obtenue en faisant la somme des quantités des carburants formel et informel consommées par un individu au cours du mois.

Type de carburant préféré (TCP): C'est une variable muette qui prend la valeur 1 si l'individu préféré le carburant formel et la valeur 0 s'il préfère le carburant Zoua-Zoua. Cette variable a été obtenue en demandant à l'enquêté de donner le type de carburant qu'il préfère lorsque le prix de l'essence formelle est fixé à 655 FCFA[5] et celui du carburant frelaté fixé à 400FCFA[6].

Type de carburant préféré après variation de prix (TCPAP): Tout comme la variable *TCP*, c'est aussi une variable muette qui prend les valeurs 0 et 1 si l'individu préfère respectivement les carburants formel et informel. Ici l'on demande au consommateur de donner le carburant-essence qu'il préfère en faisant varier les prix du

[4] Car l'utilisation d'un sondage probabiliste nécessite une base de sondage.

[5] 655 FCFA prix officiel de l'essence vendue dans les stations-services de la ville de Maroua.

[6] 400 FCFA est le prix du carburant frelaté dans la ville de Maroua au cours de la période de l'enquête.

carburant frelaté entre 400 FCFA et 675 FCFA alors que le prix de l'essence formelle est fixé à 655 FCFA.

Tableau 2: Statistiques élémentaires sur les variables

Variable	Obs	Mean	Std. Dev.	Min	Max
TCPAP	300	6666667	4721922	0	1
CONSO	300	805.22	3282.611	5	30000
TCP	300	6866667	4646237	0	1

Source: construit sur la base de l'enquête à l'aide du logiciel STATA 16.

Conformément au tableau 2, les statistiques descriptives sur les variables montrent que le nombre d'observation est identique (300). Par ailleurs, les moyennes des TCPAP, CONSO et TCP sont respectivement de 6666667, 805.22 et 6866667.

d) Les tests de diagnostiques

Pour atteindre les objectifs de l'étude, appréhender le comportement et la sensibilité des automobilistes de la ville de Maroua à la consommation du carburant-essence, la démarche méthodologique consistera à utiliser la méthode de comparaison des moyennes sur des échantillons indépendants car les individus qui consomment l'essence formelle sont différents de ceux qui consomment l'essence de contrebande. C'est une nouvelle approche dans l'analyse des préférences du consommateur. Le but ici est de montrer comment utiliser les informations sur la consommation mensuelle du carburant par un consommateur de la ville de Maroua pour obtenir des renseignements concernant ses préférences par aux carburants formel et informel.

❖ Principe du test de comparaison des moyennes

Pour comparer deux échantillons d'observations il est classique d'utiliser un paramètre de tendance centrale, et généralement il s'agit de la moyenne. Deux tests statistiques, le test de Student et le test de Wilcoxon, sont généralement employés pour comparer deux moyennes. Il existe cependant des variantes de ces deux tests, pour répondre à différentes situations,comme la non indépendance des échantillons par exemple.

- Les Hypothèses des tests de STUDENT et de WILCOXON

Les hypothèses sont :

H0: $\mu 1 = \mu 2$

H1: $\mu 1 \neq \mu 2$ (bilatérale) ou H1 : $\mu 1 < \mu 2$ (unilatérale) ou H1 : $\mu 1 > \mu 2$ (unilatérale)

$\mu 1$ et $\mu 2$ sont les moyennes des populations dont sont issues les échantillons de données.

Certains auteurs disent que les hypothèses du test de Wilcoxon concernent les médianes et pas les moyennes, puisque c'est un test basé sur les rangs. D'autres encore comme Conover (1999), affirment que les hypothèses concernent les distributions, mais que le test peut être utilisé pour comparer des moyennes.

Quel que soit le test employé, le principe consiste toujours à calculer une statistique (c'est une quantité calculée selon une équation qui dépend du test employé). Cette statistique est appelée la p-value. La p-value est donc la probabilité, sous l'hypothèse nulle que les moyennes ne sont pas différentes, d'observer la valeur de statistique qui a été observée. Le seuil de significativité, ou risque alpha est très généralement fixé à 0,05.

Si la p-value est < 0.05 alors l'hypothèse nulle (H0) est rejetée. Et dans ce cas on va conclure à la différence entre les deux moyennes des populations dont sont issus les échantillons. En revanche, si la p-value est > 0.05 alors l'hypothèse nulle n'est pas rejetée. Et on va conclure à l'absence de différence entre les deux populations.

Dans le cadre de cet article, nous allons utiliser le test de Student.

- Le test de STUDENT

Il s'agit d'un test paramétrique, c'est-à-dire qui se base sur une distribution statistique théorique (ici la distribution de Student), qui dépend de paramètres (ici le degré de liberté $= n1 + n2 - 1$). n1 et n2 sont les tailles des échantillons.

Il existe plusieurs statistiques du test de Student selon que les variances des échantillons sont différentes ou pas, ou encore selon que les échantillons sont indépendants ou appariés. Lorsque les échantillons sont indépendants, le test de Student nécessite que les observations de chacun d'eux suivent une distribution Normale. Au cas contraire, les tailles des deux échantillons doivent être supérieures à 30. Lorsque les échantillons sont appariés c'est la différence entre les observations qui doit suivre une loi Normale.

Lorsque les échantillons sont indépendants, l'homogénéité des variances (cad leur égalité) doit être testée par un test F. En cas de rejet de l'hypothèse, une variante du test de Student peut être employée: le test de Welch. Le test de Student est censé être plus puissant que le test de Wilcoxon. Cependant, il est sensible à l'asymétrie des données qui peuvent entraîner une augmentation invisible du risque alpha. Ceci va se traduire, par exemple, par une p-value anormalement basse.

IV. Resultats de L'analyse Des Donnees

Nous présentons ici les résultats de l'analyse descriptive et les résultats des estimations par le test de comparaison des moyennes.

a) Résultats de l'analyse descriptive

Toute description d'un phénomène nécessite d'observer ou de connaître certaines choses. L'objectif de l'analyse descriptive est de décrire par des statistiques, les données disponibles. Le tableau 3 donne la répartition de l'échantillon selon le profil socioéconomique, le type et la propriété de l'engin.

Le tableau 3 montre que l'échantillon enquêté se compose d'environ 67% d'hommes et 33% de femmes. La tranche d'âge la plus représentée se situe entre 30 et 44 ans. Le niveau d'étude est globalement satisfaisant, puisqu'environ 68% de la population de sondage déclarent avoir suivi au moins une formation secondaire. Les revenus les plus courants (39,5%) s'échelonnent entre 100 000 et 200 000 FCFA par mois. S'agissant de la propriété du véhicule, 86% des enquêtés déclarent être propriétaires de leurs engins. Une représentation schématique de la répartition de l'échantillon selon les caractéristiques socio-économiques des individus interrogés est à consulté en annexe (ANNEXE 1).

Tableau 3: Répartition de l'échantillon selon le profil socioéconomique, le type et la propriété de l'engin

Profil socio-économique, type et propriété de l'engin		Nombre d'observations	Pourcentage(%)	Pourcentage cumulé (%)
SEXE	Homme	200	67	67
	Femme	100	33	100
AGE	Moins de 30 ans	62	20,7	20,7
	De 30 à 44 ans	214	71,3	92
	De 45 à 60 ans	21	7	99
	Plus de 60 ans	3	1	100
NIVEAU D'ETUDE	Sans niveau	53	17,7	17,7
	Primaire	57	19	36,7
	Secondaire 1er cycle	41	13,7	50,3
	Secondaire 2nd cycle	55	18,3	68,7
	Supérieur	94	31,3	100
	Ne se prononce pas (NSP)	0	0	100
REVENU MENSUEL MOYEN	Moins de 20.000 FCFA	3	1	1
	De 20 001 à 50.000 FCFA	37	12,4	13,4
	De 50 001 à 100 000 FCFA	67	22,4	35,8
	De 100 001 à 200 000 FCFA	118	39,5	75,3
	De 200 001 à 500 000 FCFA	56	18,7	94
	Plus de 500 000 FCFA	18	6	100
	NSP	0	0	100

TYPE D'ENGIN	Moto	111	37	37
	Voiture	189	63	100
PROPRIETE DE L'ENGIN	Vous	258	86	86
	Votre employeur	29	9,7	95,7
	Location/Vente	12	4	99,7
	Autres	1	0,3	100

Source: construit sur la base de l'enquête.

L'observation du tableau 4 montre que la qualité du carburant-essence est le premier critère de sélection des enquêtés. 49% des individus interrogés dans la ville de Maroua, préfèrent le carburant-essence à cause de sa qualité qui, selon eux constitue le principal déterminant de la consommation de tout bien. Après le paiement par bon de carburant et la protection du moteur (respectivement 38,7% et 36,7%), le prix bas et la multiplicité des points de vente sont d'autres critères de choix les plus considérés par les consommateurs (30,7% et 29% respectivement). Une représentation schématique des raisons du choix de type de carburant-essence par les individus interrogés dans la ville de Maroua est à consulté en annexe (ANNEXE 2).

Tableau 4: Raisons du choix de type de carburant-essence

Motifs	Nombre d'observations	Pourcentage(%)
Le prix bas	92	30,7
La qualité du carburant-essence	147	49
La protection du moteur	110	36,7
La multiplicité des points de vente	87	29
La consommation à crédit	4	1,3
Le paiement par bon de carburant	116	38,7
Le choix de l'employeur	26	8,7
Autres raisons	4	1,3

Source: auteurs sur la base de l'enquête.

b) *Résultats des estimations par le test de comparaison des moyennes*

Nous présentons ici les résultats du test lorsque le prix du Zoua-Zoua est à 400 FCFA et les résultats du test lorsque le prix du Zoua-Zoua varie.

i. *Résultats du test lorsque le prix du Zoua-Zoua est à 400 FCFA*

La variable type de carburant préféré (TCP) est muette. Elle est égale à 1 si l'individu préfère le carburant formel et égale à 0, s'il préfère le carburant Zoua-Zoua. La statistique du test se trouve dans le tableau 5 (t=1,2436) et montre que la consommation moyenne du carburant Zoua-Zoua est plus élevée que celle du carburant formel. Autrement dit, le consommateur préfère le carburant Zoua-Zoua (prix faible) au carburant formel (prix élevé). Ce test suppose que la variance de la variable CONSO est différente d'un groupe à l'autre (ANNEXE 3).

Tableau 5: Test de deux échantillons avec des variances inégales

Group	Obs	Mean	Std. Err.	Std. Dev	(95% Conf.	Interval
0	200	953.655	254.6794	3601.71	451.4383	1455.872
1	100	508.35	251.696	2516.96	8.93056	1007.769
Combited	300	805.22	189.5216	3282.611	432.2548	1178.185
Diff		445.305	358.0677		-259.6962	1150.306

diff = mean(0) - mean(1) t = 1.2436

Ho: diff = 0 Satterthwaite's degrees of freedom = 266.514

Ha: diff < 0 Ha: diff != 0 Ha: diff > 0

Pr(T < t) = 0.8926 Pr(|T| > |t|) = 0.2147 Pr(T > t) = 0.1074

Source: auteurs à partir du logiciel STATA 16.

ii. *Résultats du test lorsque le prix du Zoua-Zoua varie*

La variable type de carburant préféré après variation de prix (TCPAP) est muette. Elle est égale à 1 si l'individu préfère le carburant formel et égale à 0, s'il préfère le carburant Zoua-Zoua. La statistique du test se trouve dans le tableau 6 (t=-3,7878) et montre que la consommation moyenne du carburant Zoua-Zoua est moins élevée que celle du carburant formel. Autrement dit, le consommateur préfère le carburant formel au carburant Zoua-Zoua, du fait que le prix de l'essence de contrebande a augmenté. Ce test suppose que la variance de la variable CONSO est différente d'un groupe à l'autre (ANNEXE 4).

Tableau 6: Tests de deux échantillons avec des variances inégales

Group	Obs	Mean	Std. Err.	Std. Dev	(95% Conf.	Interval
0	55	90.27273	10.08501	74.79242	70.0535	110.4919
1	245	965.7184	230.9	3614.156	510.9069	1420.53
combited	300	805.22	189.5216	3282.611	432.2548	1178.185
diff		-875.4456	231.1201		-1330.682	420.2091

diff = mean(0) - mean(1)		t = -3.7878
Ho: diff = 0		Satterthwaite's degrees of freedom =244.928
Ha: diff < 0	Ha: diff != 0	Ha: diff > 0
Pr(T < t) = 0.0001	Pr(|T| > |t|) = 0.0002	Pr(T > t) = 0.9999

Source: auteurs à partir du logiciel STATA 16.

V. Conclusion et Recommandations de Politique Economique

Cette étude s'est donnée pour objectif principal d'appréhender la sensibilité du consommateur de carburant-essence dans la ville de Maroua. Pour ce faire, l'étude a utilisée des données primaires collectées à l'aide d'un questionnaire administré aux automobilistes de la ville de Maroua. Les tests de comparaison des moyennes ont permis de constater que le consommateur est tourné vers l'informel et ne s'en détourne que lorsque le prix de l'essence dans ce secteur augmente. Ce résultat est particulièrement édifiant en ce sens qu'il prouve qu'il est possible d'agir sur certaines variables déterministes des prix du carburant informel pour provoquer des comportements libres du consommateur et qui soient favorables à l'abandon progressif de ce commerce illicite par des nombreux acteurs de ce secteur (comme la mise en place d'une taxe). Par conséquent, L'analyse du marché de carburant-essence dans la ville de Maroua et les résultats des tests de comparaison des moyennes effectués, permettent de dire que les prix jouent un rôle important sur le type de carburant préféré.

Proposer des pistes de recommandations de politique économique n'est pas aussi chose aisée. Toutefois, quelques recommandations trouvent leur justification dans les résultats obtenus. Comme l'ont suggéré Kiki et *al.* (2016), il faudrait pour l'instant penser une politique à la fois d'assainissement de ce commerce illicite plutôt que d'éradication. Les autorités publiques à travers les collectivités locales, doivent mettre en place une cellule chargée de collecter des informations pertinentes et sensibles sur le secteur informel de vente de carburant aux fins de sa maîtrise et pour réorienter les actions futures. Cette cellule aura pour mission de sensibiliser les différents intervenants dans la chaîne de distribution du carburant-essence Zoua-Zoua de la ville de Maroua sur la possibilité de s'associer en coopérative, installer des mini-stations ou des cuves à essence. La maîtrise et l'organisation de ce secteur en chaîne de valeur vont donc permettre une meilleure taxation.

Il est important de rappeler que tout travail de recherche expose l'auteur à des critiques de toutes sortes. En effet, les tests effectués ne nous ont pas permis de déterminer le prix seuil à partir duquel le consommateur est prêt à abandonner l'essence informel. Ensuite, nous n'avons pas pu recenser des informations suffisantes afin de déterminer le niveau de taxation optimale du secteur informel de vente de l'essence permettant ainsi de réduire son impact. Enfin, les données de l'étude proviennent d'une enquête effectuée sur le terrain.

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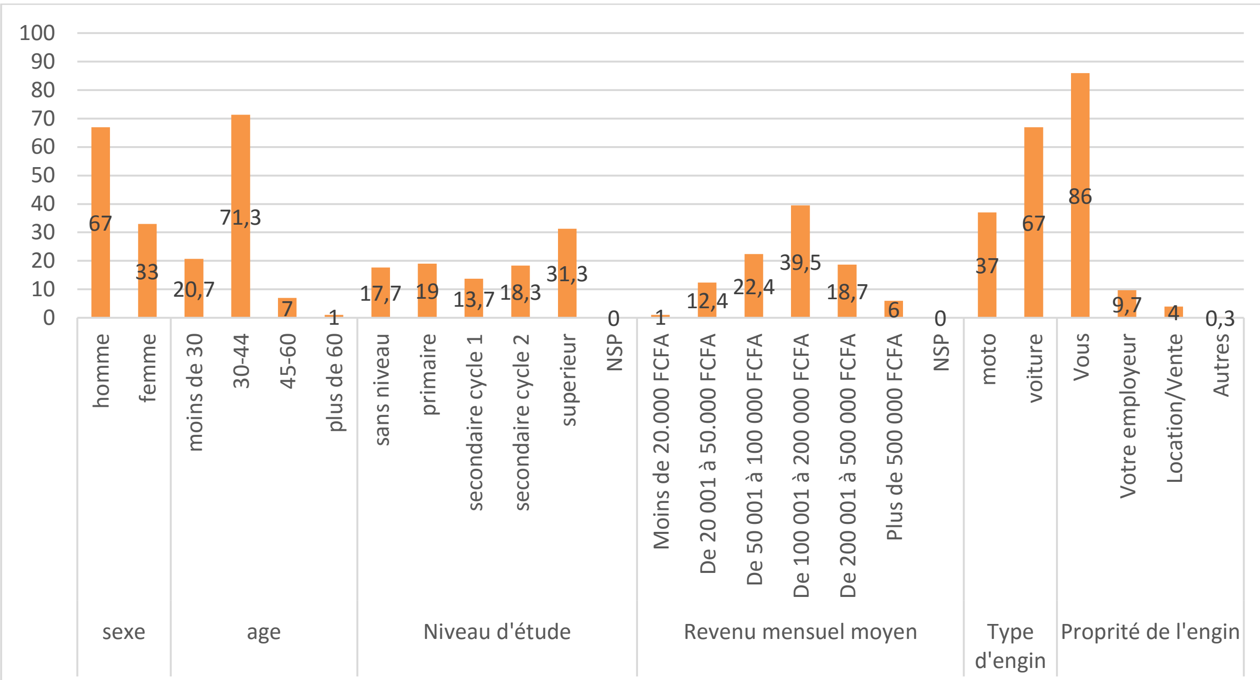
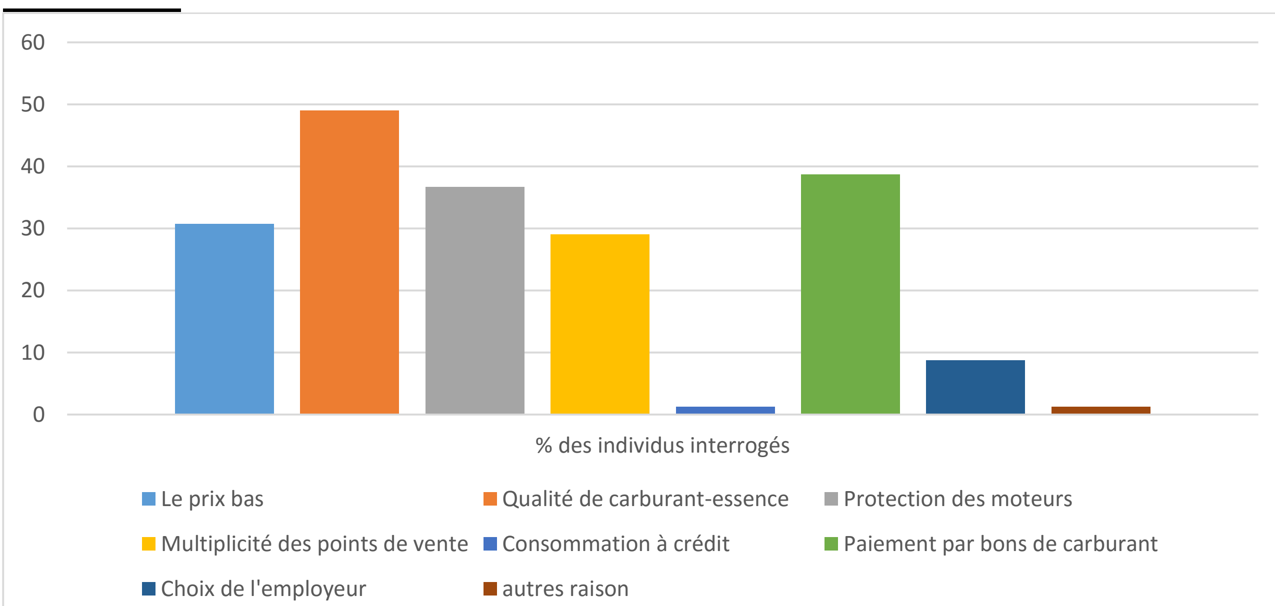
Annexes

ANNEXE 1: Répartition de l'échantillon selon les caractéristiques socioéconomiques



Source: auteurs.

ANNEXE 2: Représentation graphique des Raisons du choix de type de carburant-essence



Source: auteurs.

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ANNEXE 3: Test de comparaison des variances pour prix fixe

```
sdtest conso,by( tcp)

Variance ratio test
------------------------------------------------------------------------------
   Group |     Obs        Mean    Std. Err.   Std. Dev.   [95% Conf. Interval]
---------+--------------------------------------------------------------------
       0 |     200     953.655    254.6794     3601.71    451.4383    1455.872
       1 |     100      508.35     251.696     2516.96     8.93056    1007.769
---------+--------------------------------------------------------------------
combined |     300      805.22    189.5216    3282.611    432.2548    1178.185
------------------------------------------------------------------------------
    ratio = sd(0) / sd(1)                                         f =   2.0477
Ho: ratio = 1                                    degrees of freedom =  199, 99

    Ha: ratio < 1               Ha: ratio != 1                 Ha: ratio > 1
  Pr(F < f) = 1.0000         2*Pr(F > f) = 0.0001          Pr(F > f) = 0.0000
```

ANNEXE 4: Test de comparaison des variances pour prix variable

```
sdtest conso,by( tcpap )

Variance ratio test
------------------------------------------------------------------------------
   Group |     Obs        Mean    Std. Err.   Std. Dev.   [95% Conf. Interval]
---------+--------------------------------------------------------------------
       0 |      55    90.27273    10.08501    74.79242     70.0535    110.4919
       1 |     245    965.7184       230.9    3614.156    510.9069     1420.53
---------+--------------------------------------------------------------------
combined |     300      805.22    189.5216    3282.611    432.2548    1178.185
------------------------------------------------------------------------------
    ratio = sd(0) / sd(1)                                         f =   0.0004
Ho: ratio = 1                                    degrees of freedom =  54, 244

    Ha: ratio < 1               Ha: ratio != 1                 Ha: ratio > 1
  Pr(F < f) = 0.0000         2*Pr(F < f) = 0.0000          Pr(F > f) = 1.0000
```

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Progress of System Reforms in the CIS Countries, Especially in Uzbekistan

By Bekhzod Djalilov

Rector of Akfa University

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Keywords: system reforms; post-soviet countries; uzbekistan; economy; action strategy; socio-economic transformation; market reforms.

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Strictly as per the compliance and regulations of:

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I. Introduction

For the first time after the formation of independent states on the former USSR territory, such a representative forum of the expert community from the CIS countries gathered to discuss the problems and prospects for the development of our national economies[1]. When talking about economic reforms in Poland, the Czech Republic, Slovakia, and the Baltic states, it is generally recognized that these countries react differently to similar problems. However, unfortunately, the study of Russian issues is carried out in isolation from the experience of the post-socialist transition of other countries and, in particular, the CIS countries. Although the history and practice of socio-economic transformation in these countries provide the wealthiest material for analysis and comparison, it is better to understand Russian reforms' specifics [2].

Studies of recent years in the field of the functioning of the economies of post-socialist countries have led to two crucial conclusions [3]:

1. For the further economic development of these countries, the starting conditions of the transformation processes are of decisive importance, such as the duration of the existence of the communist regime, structural imbalances in the national economy, the level of military burden on the economy, and proximity to Western Europe.
2. Over time, the quality of the post-communist governments' economic policy and the effectiveness of the fundamental institutions created are gaining importance.

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In recent years, the entire post-socialist world, including the CIS countries, has emerged from the process that J. Kornai called a transformational recession [4]. Over the past 5-6 years, economic growth has recovered and continues everywhere. In the first stage, he relied on recovery processes. Economic growth was ensured by the start of market institutions' satisfactory functioning and the utilization of existing production facilities and labor. The role of investments in the creation of new capacities was limited [5].

What were the reform process thoughts in international financial institutions and Western universities and economists from countries with economies in transition? We have argued that it includes the following four key elements [6]:

- The need to create a stable macroeconomic framework;
- The need to liberalize prices and trade;
- The need to carry out structural reforms as quickly as possible that will help create markets, including reform of the labor market, agriculture, financial sectors, and privatization, even if the implementation of these reforms will take a long time;
- Creation of institutions necessary for the functioning of the market system: legislation, the structure of corporate management, including modern methods of accounting and reporting; and government institutions that ensure the efficient functioning of the economy, such as the central bank and the treasury.

What were the lessons of the reforms?

Lesson 1: The Wider Washington Consensus works. The first and crucial one: the idea of what had to be done was, on the whole, correct. These views can be called the Washington Consensus (although this term is contradictory), but it would be more accurate to say: the expanded Washington Consensus. It is based on market approaches and a focus on the above four elements. It also argues that the faster structural reforms are implemented, the quicker the economy will grow. Of course, in practice, many problems need to be resolved, and various variations of these elements are possible but provided that the basic orientation of the policy pursued is adequate [7].

Perhaps one day, we will discover a better alternative to the market system. Still, the experience of centuries and the evidence accumulated during the post-communist transition confirm the basic approach to the problem of growth and development enshrined in the textbooks.

The 2nd lesson is that economic policies need to be adjusted to suit country specificities. There is no doubt that consensus is only a vehicle for putting policy into practice since what needs to be done depends on a particular country's situation. No one from the outside can know precisely what is possible and what cannot be done at a given moment in time. But this does not negate the fact that if the rapid change is not ensured, it will have to pay dearly [8].

If even the noblest political impulses get in the way of creating a stable macroeconomic framework, then there is a price to pay. Now, after 1998, Russians are well aware of this. The most important lesson of that time was summarized by L. Balcerowicz, saying that if there is a political opportunity to move in the right direction, it must be used.

Lesson 3: The key to success is integration into the global economy. In addition to creating a market economy, of all the elements of this consensus, the most important guiding principle is the policy of integration into the global economy. Even such vast and powerful countries as Russia cannot successfully develop within themselves and by themselves. Not to mention small countries, which all the more do not have the opportunity to develop all sectors in need of modernization. However, to ensure their economies' rapid development, even such large countries as Russia or Brazil or China, or India need to integrate into the global economy [9].

In the past, we have emphasized that countries need to expand their exports quickly, and no government can indeed overgrow without rapidly growing exports. Today, some believe that the rapid growth of imports, particularly capital and other goods, has become an urgent need, which is why the need to develop export opportunities rapidly. In any case, countries with high economic growth rates experienced exceptionally high rates of increase in imports and exports [10].

Lesson 4: The importance of the investment climate, in particular, to stimulate domestic investment. Creating an investment climate conducive to foreign direct investment is a critical factor in economic development, as foreign-invested enterprises bring in alien technology and business practices, as well as foreign capital [11].

The investment climate is even more important for another reason: if it is favorable for foreign investment, it will be equally fair for domestic investors. There is not a single country in the world whose economy grew only due to foreign investment. Domestic investment's role always remains critical since their volume makes up the majority of the total investment volume. Besides, the same factors that stimulate domestic investors will generate foreign investment inflows [12].

Lesson 5: Stabilizing inflation. The 1990s taught the world many lessons about stabilizing inflation both in transition countries and elsewhere. Using a fixed exchange rate as a disinflation tool is probably the fastest way to combat high inflation, but it is also a double-edged weapon. Using a fixed rate as a temporary tool to curb high inflation is a great solution, but (and this is the most difficult one) you need to be prepared to get out of this regime before circumstances force it [13].

Lesson 6: Flat tax rates have proven more effective than expected. The country that taught the sixth lesson - about fiscal policy - was Russia. Here the reduced flat tax rate worked much better than the Western expert community unanimously assumed [14]. This is an exciting and essential lesson for the future. It has already been adopted by some of Russia's neighbors, as the movement for low flat tax rates is spreading beyond Russia - to other CIS countries and across Eastern Europe.

Lesson 7: Private property. Private property is almost always more efficient than public property. Of course, there are examples of successful public companies such as Electricite de France in the world. Of course, the privatization process can be dangerous if it occurs before the appropriate legislative and regulatory mechanisms are in place. However, in most cases, the private property turned out to be more effective than state property [15].

Lesson 8: Financial Sector Reform. The role of efficiently operating financial markets is excellent. Considerable evidence and experience accumulated in the world confirm this conclusion [16].

II. Reforms on the Example of the Republic of Uzbekistan

President Shavkat Mirziyoyev, by decree of September 8, 2017, approved the Concept of Administrative Reform in the Republic of Uzbekistan and the "Road Map" for its implementation. The Concept defines six main directions of radical reform of the state government system in Uzbekistan [17].

The planned administrative reform's objectives were to create a public administration system that meets global trends in innovative development, capable of ensuring the full implementation of the planned reforms, timely identifying and effectively solving problems of socio-political and socio-economic development [18]. The reform has also been created effective mechanisms for ensuring citizens' rights and freedoms, increasing their well-being and the level of satisfaction with government agencies' activities [19].

The strategy of actions in five priority areas of development of the Republic of Uzbekistan in 2017-2021 (Action Strategy) identified the critical goals of modernization of the government and society as improving state and social construction, ensuring the rule of law, and strengthening guarantees of protecting the rights and freedoms of citizens, developing and liberalizing economic sectors and social sphere, providing security, interethnic harmony and religious tolerance, implementation of a balanced, mutually beneficial and constructive foreign policy [20].

The essential condition for achieving these goals was the transparent functioning of the public administration system, capable of ensuring the full implementation of ongoing reforms, adopted regulatory legal acts and government programs, and timely identify and effectively solve problems of socio-political and socio-economic development.

At the same time, the systematic analysis of the implementation of the Action Strategy and the results of the dialogue with the population indicate the persistence of severe shortcomings in the organization of the activities of public administration bodies and local executive authorities (from now on referred to as executive officers), which impede the full implementation of reforms [21].

Achieving the goals of the Action Strategy in five priority areas of development of the Republic of Uzbekistan in 2017-2021, as well as solving the planned tasks for the period up to 2030, requires the creation of a new, well-functioning system of public administration, the organization of coordinated activities of government bodies and local executive authorities [22]. For these purposes, the Concept of managing the national economy is being developed in the Republic [23].

Earlier, by the Concept of Administrative Reform, approved on September 8, 2017, the main tasks for the radical reform of public administration of the economy were identified, which are gradually implemented in practice. The next step towards improving the national economy's management system is the adoption of Presidential Decree No. PD-5877, dated November 18, 2019, provides for collaborative work on the part of the Central Bank and the Cabinet of Ministers [24].

In recent years, the Republic adopted the Concept for Improving Tax Policy (June 2018) and the Tax Code in the new edition (from 1.01.2020), which created the basis for the formation of a new architecture of the national tax system, creating preconditions for increasing the efficiency of the state system. economic management [25].

At the conference call, which was held on June 9 this year, the Head of the Government Shavkat Mirziyoyev voiced priority areas [26] to ensure economic growth, including providing economic and financial stability; poverty reduction and employment growth; accelerating reforms in the banking system, increasing the inflow of foreign direct investment, increasing export potential, strengthening competitiveness in the industry, developing small businesses and the widespread introduction of digital technologies [7].

The change during the current year in the priorities of economic development is associated with the negative impact on the coronavirus pandemic's economy. The introduction of forced restrictions led to the suspension of many business entities' activities, which led to an increase in unemployment and a decrease in household income. Therefore, in connection with poverty growth, the second most important direction of the country's economic development is "reducing poverty and expanding employment" [27].

To qualitatively implement these critical areas of economic development, it is necessary to create an effective financial management system and adapt it to action in the context of expanding the scope of market incentives. This system's critical factor is the formation of a scientifically grounded Concept of economic management, taking into account the fundamental foundations and modern foreign experience accumulated in this area [28].

To develop an effective economic management system, it is necessary to consider the institutional factors of market transformations and take into account their effect when carrying out further reforms [29].

In the process of transition to a market economy, it is advisable for the government to "fully control the situation with price liberalization, the provision of social protection and the creation of social capital ..." [30] Removing price control should coincide with eliminating existing imbalances. Simultaneously, state-regulated prices limit the abuse of power by the outside monopolies [16].

In the Russian Federation, during the shock liberalization of prices, despite the obvious negative consequences, the reformers did not timely make adjustments to the mechanisms used, which led to the default of the national economy in 1998 [12].

The privatization program must also cover a relatively long period during which state property must find the most efficient property manager.

In the context of phased market reforms, it is necessary to create conditions for explicit, functional coordination of key government ministries, departments, agencies, and other structures. Simultaneously, it is required to eliminate duplication of functions and entrust each facility with specific tasks at the appropriate development stage [31].

According to experts, almost all successful reforms are organized according to a general scheme, following the strategy of creating intermediate institutions. A new understanding of reform follows from the experience of the 1990s: reform is not a one-step act, but the construction of a sequence of intermediate institutions in a suitable institutional space [18].

III. Conclusion

Analysis of foreign experience shows that the best development is achieved by countries that used mainly market mechanisms for regulating the economy. However, the "market" is only one of many necessary instruments to achieve the country's socio-economic development goals, which must be used on a systematic basis.

Therefore, it is necessary to clearly "outline the boundaries" in which areas the state should maintain market relations, in which to regulate activities, and in which - to produce or provide services.

When developing a new economic management system, it is necessary to include tasks for both the development of market institutions and administrative procedures. The parallel use of organizational levers will ensure an adequate transition to a market economy. This helps mitigate social consequences and maintain stability in society. First of all, this concerns the spread of free prices, the privatization of state-owned enterprises, the liberalization of foreign trade, the use of subsidies to support low-profit areas of activity (especially in the context of a worsening epidemiological situation and forced restrictions).

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Economics of High-Density Apple Orchards: A Comparative Analysis of Jammu and Kashmir, India and Trentino-Alto-Adige, Italy

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Abstract- High-density apple orchards have substantially increased productivity as well as production worldwide. In India, High-Density Apple Plantation scheme was launched in 2015-16 in Jammu and Kashmir with root-stocks imported from Trentino-Alto-Adige, Italy. Trentino-Alto-Adige in Italy is one of the most important regions producing high-quality apples in Europe. This paper compares the yield, input costs and payback period of High-Density Apple Orchards of Jammu & Kashmir, India with Italian (Trentino-Alto-Adige) counterparts. The yield of high-density orchards has substantially improved and the payback period is just five years now, similar to the performance of Italian orchards. Lower gestation period gives the farmers a better leeway to profitability, but the high investment cost upfront is a challenge and thus, 95 percent of the farmers chose lower density apple orchards. The government should improve access to credit and establish Farmer Producer Organisation for cluster development of the sector in the region.

Keywords: *high-density orchards, productivity, production costs, payback period, higher returns.*

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ECONOMICSOFHIGHDENSITYAPPLEORCHARDSACOMPARATIVEANALYSISOFJAMMUANDKASHMIRINDIAANDTRENTINOALTOADIGEITALY

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Bakhtaver Hassan [α], Dr. Mahua Bhattacharjee [σ] & Dr. Shabbir Wani [ρ]

Abstract- High-density apple orchards have substantially increased productivity as well as production worldwide. In India, High-Density Apple Plantation scheme was launched in 2015-16 in Jammu and Kashmir with root-stocks imported from Trentino-Alto-Adige, Italy. Trentino-Alto-Adige in Italy is one of the most important regions producing high-quality apples in Europe. This paper compares the yield, input costs and payback period of High-Density Apple Orchards of Jammu & Kashmir, India with Italian (Trentino-Alto-Adige) counterparts. The yield of high-density orchards has substantially improved and the payback period is just five years now, similar to the performance of Italian orchards. Lower gestation period gives the farmers a better leeway to profitability, but the high investment cost upfront is a challenge and thus, 95 percent of the farmers chose lower density apple orchards. The government should improve access to credit and establish Farmer Producer Organisation for cluster development of the sector in the region.

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I. Introduction

The region of Jammu and Kashmir in India, continues to be an agrarian economy. Nearly 70 percent of the population of the Union Territory is directly or indirectly involved in agriculture. According to the latest data of Economic Survey, 2019-20, agriculture in Jammu & Kashmir, contributes 17.2 percent to the total Gross State Domestic Product- GSDP and its growth rate (9 percent) is substantially higher than the national average (2.9 percent). Amongst the agricultural activities, horticulture is the most important driver of the growth rate and contributes 40 percent to the total output value from agriculture in Jammu and Kashmir. (Readers' Digest, J&K, 2017-18). Nearly 3.3 million people are directly or indirectly involved in this sector (Jha et al, 2019). The government too acknowledging the importance of the sector has brought in various schemes like Mission for Integrated Development of Horticulture, Prime Ministers' Development Package, Mega Food Park Development and High-Density Apple Orchards. Infrastructural development like establishment of fruit-markets, controlled atmosphere storages and deployment of agricultural extension services to the rural farmers has also been on the anvil of the government.

Apple is the most important horticultural crop of the Union Territory contributing 60-65 percent to the total output of horticulture. Even on the national level, Jammu and Kashmir, produces 75 percent of the total apples in the country. (Mir et al, 2018, Hanan 2015). In terms of economy, the sector is ever-increasing with an annual export of 7500 crores from the fruits alone (Shaheen et al, 2019).

Apple crop has tremendously grown in Jammu and Kashmir in the last five decades. The area under apple crop has increased from 46 thousand hectares to 1.64 lakh hectares from 1974 to 2018-19. (Directorate of Horticulture, Jammu & Kashmir, 2019-20). Consequently, the production has increased from 1.9 lakh metric tonnes to 19 lakhs metric tonnes during the same time-period. The productivity has also increased from mere 4.12 tonnes/hectare in 1974 to 11.43 tonnes/hectare in 2018-19. (Directorate of Horticulture, J&K 2019). Overall, the area and production in horticulture has witnessed tremendous growth during these years and as a result the Union Territory has emerged as a horticultural hotspot in the country.

The agri-climatic conditions of the Union Territory have also been favourable for the development of the sector. The Union Territory falls in three major agri-climatic zones, Sub-Tropical, Intermediate and the Temperate Zone. (Hanan, 2015). It is the temperate zone where horticultural production and acreage has been dominant. This majorly falls in the Valley of Kashmir, where crops like Apple, Pear, Walnut, Apricot, Peaches and Cherries are mostly produced. At 11.43 tonnes/hectare, the productivity in Union Territory is way ahead than 6.7 tonnes/hectare of Himachal Pradesh- the second largest producer of apple in the country. Naturally, since the conception of the development of Horticulture crops in the region, the region has witnessed higher productivity than the national average. However, on comparative basis this productivity is significantly lower than the productivity in developed economies like New Zealand (65-70 tonnes/hectare), Italy (70-75 tonnes/hectare) and Netherlands (75-80

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tonnes/hectare). (Fondazione Edmund Mach Conference, 2013). The reason for such high productivity is the application of scientific and modern-day farming like high-density apple orcharding (Ivey 1990), Meland 2005).

Italy witnesses one of the highest yields per hectare of apples in the world with Trentino-Alto-Adige and South Tyrol regions contributing 80-85 percent to the total production of Apple in the country. Trentino-Alto-Adige is an autonomous region in Northern Italy. The region owing to its mountainous topography shows resemblance with Jammu and Kashmir, India in terms of agri-climatic conditions. The region produces 67 percent of the total apples in Italy which is similar to 75 percent production of apples in Jammu and Kashmir, from a near similar acreage of 50 percent in both the regions (Giorgio De Ros, 2011, National Horticulture Board. 2019). According to National Government of Italy, Trentino is one of the most important growing areas of high-quality apples throughout Europe. The High-Density Apple Orchards in Trentino have considerably changed the face of the apple production in the region. These high-density apple orchards have phenomenally enhanced both production and productivity across the regions. In New Zealand, scientific management and effective supervision of these high-density apple orchards have substantially improved yield per hectare from last few decades (Cahn and Goedegebure, 1992). Further, there is direct relationship between tree-density in the orchards and their respective yield. With high-density of trees in the orchards, the yield increases proportionately.

Another striking feature of the High-Density Intensive Orcharding is that their economic efficiency is relatively higher. Early gestation period and high-quality of the produce makes them highly profitable for the farmers. Badiu et al (2015). In quantitative terms, the high-density orchards generate extremely high revenue than the traditional orchard-systems. (Clements, 2011). In Himachal Pradesh, the roll out of high-density apple orchards in 1990s have substantially increased the productivity of the apple crop. Large and middle farmers have largely benefited from these orchard systems and the total value of output of Apple from the Himachal Pradesh has also increased significantly. (Singh et al., 2012).

This paper is divided in two main parts- PART I and II. Part I presents economic analysis of the different densities of High-Density Apple Orchards in Trentino-Alto-Adige, Italy. There are three important areas discussed, first is the yield per hectare in different tree-densities. Second, is the establishment cost of the orchards upfront and third is the payback period of the total investment in different orchards. Part II compares the performance of the High-Density Apple Orchards in Jammu & Kashmir with the Trentino-Alto-Adige region of Italy. It depicts how the scheme has so far fared as compared to the Italian Orchards on three parameters- yield, establishment cost and the payback period. In the conclusion, the paper attempts to suggest reforms and aspects where the scheme can perform effectively in the Union Territory.

II. Data and Methodolgy

Primary data was collected from the sample of farmers who were the beneficiaries of the High-Density Apple Plantation Scheme in the first year. A sample of 50 farmers from Pulwama and Kulgam District was taken who undertook high-density apple orcharding in their respective farms. In the first year of the inception of the scheme, 60 hectares of land was used for the scheme. The farmers were divided according to their land size and each farm was identified with a certain tree-density combination. Nearly 80 percent of the farmers under the scheme were identified and interviewed through the questionnaire (see Table 1).

Table 1: Farm-size of the sampled orchardists.

Size of Farm	Number of Farms	Percentage with less than <1000 Trees/Ha	Percentage of farmers 1500 Trees/Ha	Percentage of farmers 2000 Trees/ha	Percentage of Farmers 3000 Trees/ha	Percentage of Farmers with 4000 Trees/ha
Marginal (<0.1 hectare)	10(20)	10	10	70	10	0
Small (0.1-1 hectare)	17(34)	11.7	11.7	64.71	11.7	0
Medium (1-2 hectares)	20(40)	0	15	75	10	0
Large (>2 hectares)	3(6)	0	25	75	0	0
Total Percent	50 No	6	14	70	10	0

Parenthesis Denote Percent

Data from the Horticulture Department regarding the cost per hectare was compared with the primary data collected from the farmers. This data was used to develop the relationship between the cost of the trees/hectare and the density of trees.

Payback period of the total investment was also calculated from the data. Cahn and Goedegebure (1992) had used the same concept of payback period in their analysis. Payback period refers to the time from which the orchardists starts earning profits from their farms. It is usually calculated as the year when the net cost is zero, that is the total investment equals to the total revenue earned during the years. We assessed the socio-economic conditions which included land-size and income of the farmers involved to understand the background of the region, as it also impacts the adoption of farm technology and level of investment on the farms.

Secondary Data from the Economic Survey of Jammu and Kashmir was used to analyse the growth and development of the horticultural sector in Jammu and Kashmir. To analyse the horticultural data from Trentino-Alto-Adige, Italy, we used different data sources from the Istituto Nazionale di Statistica and Ministry of Agriculture, Food and Forestry, Italy.

We chose High-Density Orchards from Trentino-Alto-Adige, of Italy for comparative analysis because the plantation scheme rolled out in Jammu and Kashmir, India had its origin from Trentino-Alto-Adige. These root-stocks were imported by the government in partnership with a private entrepreneur, who had thoroughly studied these Italian high-density apple orchards. Therefore, the analysis of the high-density apple orchards of Trentino-Alto-Adige, Italy becomes necessary to make an assessment of the performance of the high-density orchards developed in Jammu and Kashmir, India.

The establishment cost includes plant-material, development of trellis and anti-hail system, drip irrigation cost set-up, land-development, fencing and tree-training cost which includes the labour cost. It also includes the fertilizer and pesticides cost for the first year. For the payback period calculation, the maintenance cost per annum includes fertilizer and pesticides cost, tree-training, harvesting cost, transportation cost, interest cost for the credit taken upfront by the farmer and the land value (rental value of land per annum). These costs vary according to the tree-density of the orchards, as with the higher-density orchards the cost rises. Further, with each passing year the harvesting cost along with the subsequent attached costs increase with the increase in production of the apple.

Regression Analysis was performed on the establishment and the maintenance cost in the fifth year of the high-density orchards in Italy and Jammu and Kashmir simultaneously to provide an insight of the significance of the independent variables on the total revenue earned from the high-density orchard. Formula for regression analysis is:

$$\gamma = \beta_1 + \beta_2 X_2 + \beta_3 X_3 \dots \dots \dots \dots + \beta_n X_n$$

Where "γ" is the total revenue in the fifth year of the high-density orchard in Jammu and Kashmir and Italy, "β_2" is the coefficient of the cost of the plant-material, "β_3" is the coefficient of the cost of the land-development and fencing. "β_4" is the coefficient of the cost of trellis system, "β_5" is the coefficient of fertlizers and pesticides per annum and "β_6" is the coefficient of the supervision, harvesting and the cost of tree-training which includes the labour cost. Where "X_2" is the cost of the material, "X_3" is the cost of the land development and fencing, "X_4" is the cost of the trellis system, "X_5" is the amount of fertilizers and pesticides in kilograms, "X_6" is the cost of the supervision, harvesting and tree-training which includes labour cost.

III. Results and Discussion

a) Part I- Case of High-Density Apple Cultivation in Italy

The tree density and the yield show a linear relationship for each growing year. According to the scientific evidence, Year 7 is considered as the year of full production as the trees reach their maturity. Figure 1, shows the yields calculated for each year upto the seventh year with respective to three different tree densities. The graph shows that the yield per hectare keeps on increasing with each passing year. In 2000 trees/hectare category, there is a linear relationship between the yield and the tree density in the first few years. However, the increase in yield slows down post the second year in the other densities. Another important aspect is the late-upswing in the yields of two higher-density orchards- 3000 trees/ha and 4000 trees/ha. It implies that post the seventh year, the higher-density orchards show increased yield making them a long-term investment.

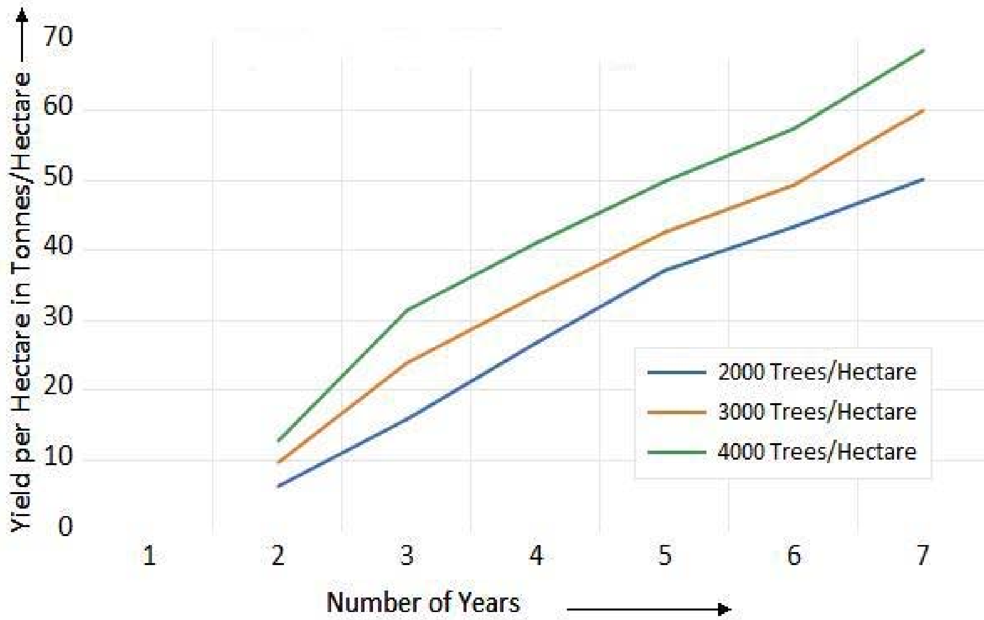

Figure 1: Yield per Hectare through the Years

Figure 2, shows the cost of the trees per hectare which includes the establishment cost of the trees. The establishment cost mainly includes, plant-material cost, drip-irrigation set-up cost, trellis system development cost, fencing, fertlizers and pesticides cost, tree-training cost and supervision cost. The graph shows linear relationship between the tree density/hectare and the cost of trees, as the equation we concluded was Y= 4681+ 4.14X, (P<0.01), where Y is the total cost per hectare and X is the tree density per hectare (see, Figure 2). There is slight dip with the increase in density of the trees which means that the costs lower when the densities increase. The lowering of the costs is partly attributed to the discount offers and the economies of scale. McKenzie et al., (1976) had discussed the relative cost of high-density apple vis-à-vis the traditional farming of New Zealand and found a similar linear increase with a slight fall in the highest bracket.

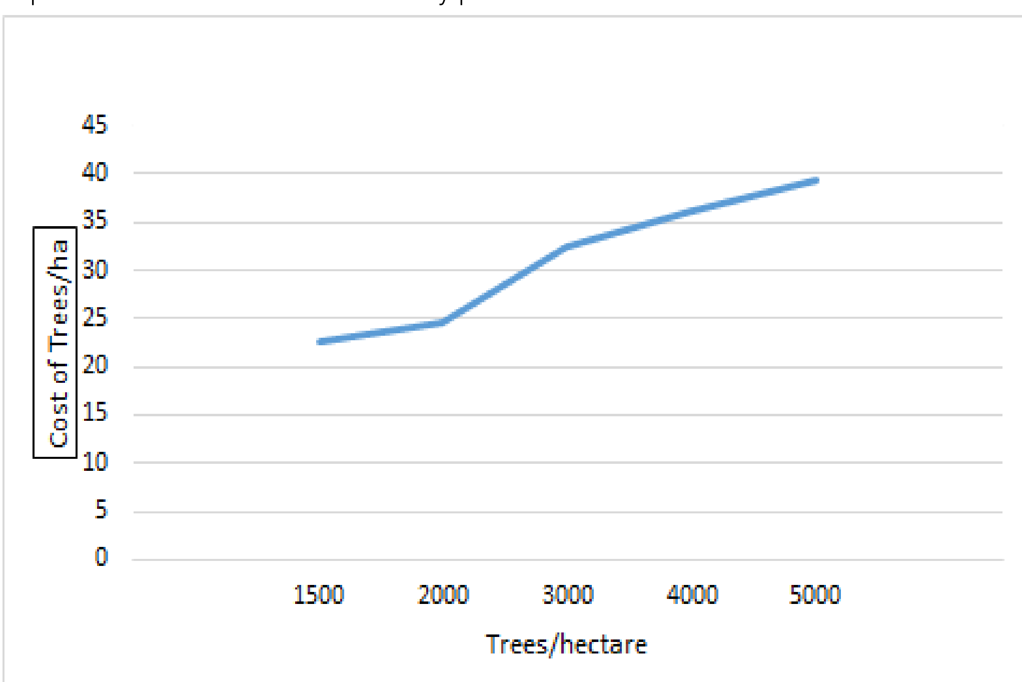

Figure 2: Cost of Trees/ha with respect to Tree Density

According to Table 2, the establishment costs in the first year (Year 1) ranges from 22.7 thousand euros for 1500 Trees/Hectare to 38.4 Thousand Euros for 4000Trees/Hectare. In the lower-density orchards, the upfront cost per tree is high when compared with the higher-density orchards in proportion. The supreme quality of the high-density apple trees enables them to bear fruit in the second year only. Although the yield is low and doesn't amount to any substantial returns in that year, thus we have a net additional accumulated amount in the second year on account of the maintenance and production cost like fertilizer, pesticide and tree-training raising the overall investment (see, Table 2)

Table 2: Payback period in terms of accumulated amount.

Amount = Euro (000/ha)

Trees/Ha	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
1500	(-22.7)	(-24.4)	(-22.2)	(-12.5)	(-1.4)	20.5	41.5
2000	(-24.2)	(-31.2)	(-27.1)	(-14.5)	3.5	24.6	50.1
2500	(-28.8)	(-34.2)	(-29.3)	(-16.2)	4.9	30.7	55.5
3000	(-32.4)	(-37.4)	(-31.4)	(-15.9)	6.3	38.5	61.9
3500	(-33.5)	(-40.4)	(-34.5)	(-16.1)	8.5	43.8	68.5
4000	(-36.2)	(-42.4)	(-35.2)	(-17.6)	11.5	48.2	71.52

Source: MONIQA Italy, OECD.

The farmer starts earning profit in the fifth year. The lower -density orchards have higher productivity from the start and as such the respective farmers start receiving profits sooner than the other farmers. However, with increase in the tree density, we see a large jump in the profitability from the fifth year which increases significantly with each passing year. The less dense orchards therefore show a short-term gain at a rapid pace, while it steadies its profiteering from Year 6 onwards. The trend runs opposite in higher density orchard combinations, where the yield per hectare increases steadily over a longer time-period, making it a better investment venture for the farmers. The result is consistent with the findings of Ivey (1990), who studied the impact of high-density orchards on the farm-returns. Cahn (1992), had made similar conclusions when studying the farms of Netherlands.

b) *Part II- Case of High-Density Apple Cultivation Scheme- Jammu and Kashmir. India*

In the introduction we have attempted to analyse the importance of Horticulture in the state economy. And it needs no emphasis that the acreage under horticulture as well as the production has increased manifold during the last few decades. Hanan (2015). Primarily, the value of output per hectare has pushed for the diversification in agriculture, particularly towards apple cultivation in the erstwhile state. On the other hand, the cost of production of the apple crop is consistently on the rise whereas the marketing potential is not increasing at the same rate. Moreover, the productivity of apple in the Union Territory has plateaued at 11.43 tonnes/ hectare, and from past few years it has remained nearly stagnant (Directorate of Horticulture, Jammu and Kashmir, 2019). This has resulted in lesser net return than the potential of the crop in the region. The stagnancy in productivity is due to application of traditional methods of cultivation, harvesting and post-harvesting.

Acknowledging the significance of the crop, the Government of Jammu and Kashmir brought in a 100% State Sponsored High-Density Apple Plantation Scheme (Department of Horticulture, Jammu and Kashmir, 2015). The Government has laid down the standards of procedure in planting different tree densities in the orchards. According to the government, the scheme provides two major tree-densities per hectare which the farmer can opt. However, the farmer in consonance with the agricultural scientists can also improvise according to their own interests and needs.

The orchardist witnessed production from the onset of the second year only (Year 2). The productivity per hectare increases year on year from the second year, increasing from 1.9 tonnes/hectare to 9.1 tonnes/ hectare in the lowest density orchards (1000 trees/ hectare) (see Figure 3). In orchards with tree density of 1500 trees/hectare and 2000 trees/hectare, the productivity or the yield per hectare has increased from 3 tonnes/hectare and 4 tonnes/hectare to 14 tonnes/ hectare and 17 tonnes/hectare respectively. Similarly, in orchards with density of 3000 trees/hectare the yield has increased from 5 tonnes/hectare in the second year to 20 tonnes/hectare in the fifth year. Therefore, the yield per hectare has substantially increased in all the orchard combinations. Although, the trees are yet to reach their maturity, their yield per hectare has surpassed the yield of the mature traditional apple orchards. The yield per hectare is likely to reach 50-70 tonnes/hectare in the higher densities (Clements, 2011). Therefore, making it one of the most profitable horticultural investment for the farmers.

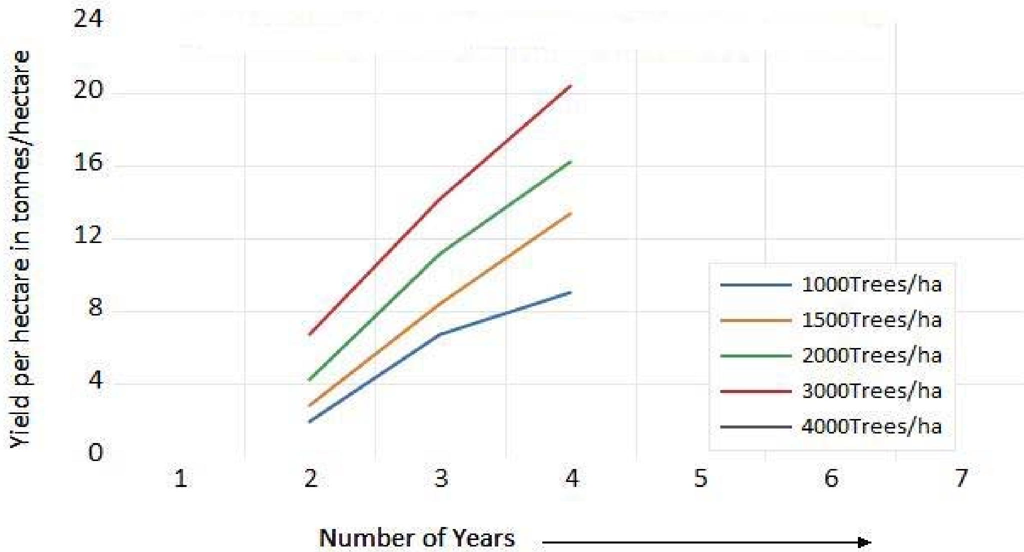

Figure 3: Yield per hectare with respect to Orchard Density

Another important point to be noted here is that there is fall in productivity in the lower-density orchards while in the higher categories the increase in productivity is linearly proportional to the number of years (see, Figure 3). This fall is higher as compared to the Italian orchards and may be attributed to poor-rootstocks supplied, improper or inadequate management of the crops by these farmers or even to some agri-climatic differences. In the higher category, the productivity increases linearly which is consistent with Cahn and Goedegebure (1992) analysis of the crops in Netherland.

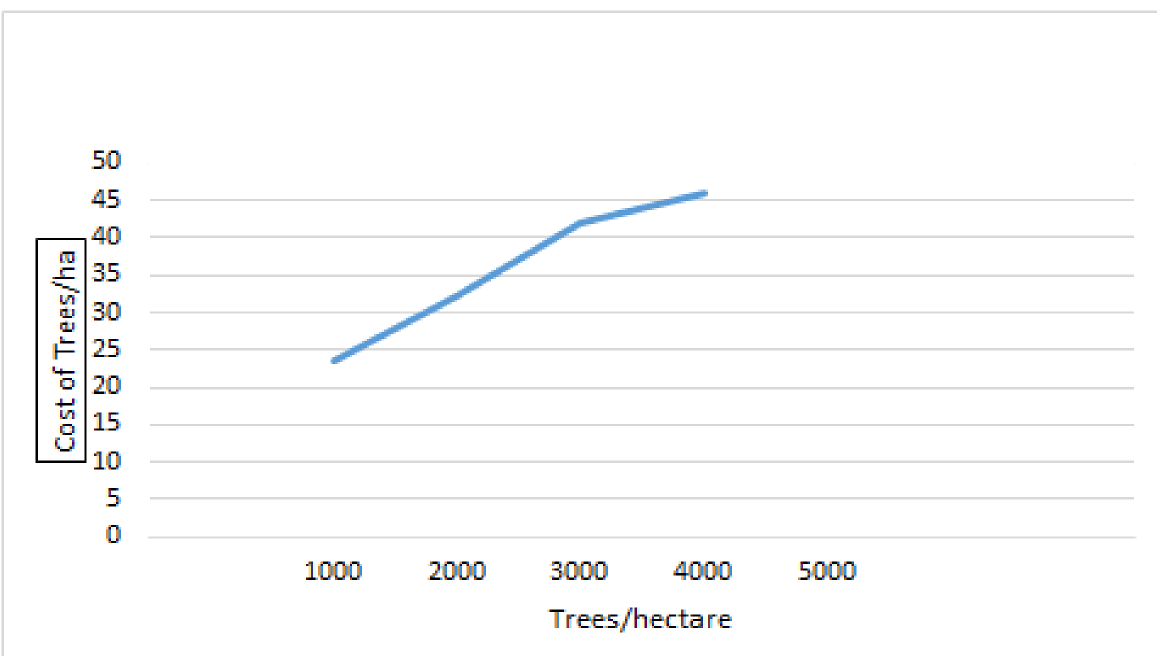

Figure 4: Cost of Trees/ha with respect to Tree Density in Lakh INR

The initial investment of establishing the high-density apple orchard is very high as compared to the traditional apple orchard. First, the density of trees planted is very high and the cost of each tree is appreciably higher due to their superior quality. Second, the trellis system and the deployment of micro and drip irrigation for each tree elevates the investment cost further. On our sample survey, we understood that for each Kanal there is an average cost of 1.6 lakh INR. The annual expenditure of these orchards is substantially higher than the traditional orchards as the maintenance cost per tree increases in higher-density orchards. The establishment cost of the orchards is seen linearly proportional in the high-density apple orchards playing similar to what the Italian orchard system does. The cost increases linearly with the increase in the tree density of the orchards, however at higher densities, above 3000 trees/hectare there is slight lowering of the production cost (see, Figure 4). This is due to the discount offers and the economies of scale. Similar trend was noticed in the analysis of the Italian counterparts.

Table 3: Regression Analysis

	1000 trees/hectare		1500 trees/hectare		2000 trees/hectare		3000 trees/hectare	
Independent Variables	Estimates	p-Value	Estimates	p-Value	Estimates	p-Value	Estimates	p-Value
Plant-Material Cost	0.11	0.0165*	0.15	0.0172*	0.21	0.013*	0.19	0.0165*
Trellis and Irrigation Cost	0.14	0.031*	0.156	0.042*	0.11	0.025*	0.129	0.025*
Land Development and Fencing	-0.05	0.035*	-0.1	0.0923*	-0.09	0.059*	-0.013	0.0679*
Fertlizers and Pesticides cost	0.1	0.0258*	0.121	0.0112*	0.14	0.011*	0.163	0.0238*
Harvesting, Transportation and Supervision Cost	0.052	0.241*	0.041	0.231**	0.049	0.124**	0.0485	0.314**
Tree-Training Cost	0.06	0.2312**	0.023	0.533**	0.0192	0.0843**	0.0212	0.0813**
R-Squared	0.9145		0.9235		0.9158		0.9442	

*p<0.1, **p<0.05. ***p<0.01

The results of the regression analysis of the establishment and the maintenance cost are nearly consistent with the analysis done in Italian Orchards (see Appendix A). Plant material and the development of the trellis system is positive and significant. Even fertilizers and pesticides cost per annum is relatively significant in terms of the maintenance cost and point out to judicious use for increasing the production (see Table 3). Land Development and Fencing is negative and significant which means that it negatively impacts the revenue of the orchards. The analysis brings attention to important parameters and inputs required for the effective development of orchards.

Table 4: Payback period with respect to accumulated amount (in Rupees lakh/hectare)

Trees/Ha	Year 1(lakh/ha)	Year 2	Year 3	Year 4	Year 5
1000	(-23.6)	(-19.7)	(-13)	(0.2)	14.5
1500	(-26)	(-27.5)	(-18)	(-4)	13.8
2000	(-31)	(-32.7)	(-25)	(-7)	16.6
3000	(-42)	(-44.8)	(-29)	(-10)	22.5
4200	NA	NA	NA	NA	NA

*₹ 700/box – Price of one apple box, 18 kgs- weight of each apple box. (Total revenue= No. of boxes*price of one box)*

Table 4, presents the total accumulated investment and the annual production and maintenance costs incurred by the farmers on their respective farms per hectare basis. The Horticulture Department, Jammu and Kashmir has laid down rates for the investment of the orchard based on different densities. For an orchard with tree-density of 2000 trees/hectare, there is an upfront cost of 31 lakh INR and similarly for the tree-density of 3000 trees/hectare the cost escalates to 42 lakh INR. In addition to this, there is an annual accumulated cost on each orchard based on their density for maintenance like fertilizers, pesticides, tilling, grass-management and pruning. For instance, for the 2000 trees/density orchard the maintenance cost in the second year reaches to 1.7 lakh INR. The cost of the higher-density orchards per hectare is very high as compared to the traditional apple orchards, therefore the farmers (20 percent) chose densities below 1500 trees/hectare. Their analysis is crucial to understand their profitability as well their sustainability related to the yield per hectare.

The payback period for the orchards under study came out to be the fifth year, which is similar to that found in Italian orchards (see Table 4). This means that the farmers start earning net profits from the investment from the fifth year, earning all the investments and cost incurred on their respective farms till that year. However, for the lowest-density, the net profit for the farmers starts early from the fourth year (Year 3), which is crucial for their sustainability too. With nearly 20 percent of the farmers falling in the category of 1000-1500 trees/hectare (see Table 1), this is relevant for them as their interest cost lowers due to early repayment of their loans and the famers get the options to even enhance their investment for the betterment of the crop as well for their economic fortunes.

Moreover, when the payback periods of these orchard combinations are compared with the existing traditional apple orchard, it is concluded that high-density orchards are way ahead than the traditional apple orchards. The payback period of the traditional apple orchards is 11-12 years which lowers down to just 5 years in the high-density orchards. Malik (2013). For the payback period, the high-density orchard combinations are comparable with the high-density orchards of Italy. The net-revenue earned in these orchards in the fifth year is mentioned in Table 4. This net revenue is the total profit earned in the fifth-year factoring in all the costs and investments incurred till then (Net Revenue= Total Cost- Total Revenue). In orchards with densities 1000 trees/hectare, the net revenue of the farmers is 13.5 lakh INR, similarly for the orchards with densities 1500trees/hectare and 2000trees/hectare, the net revenue is 13.8 lakh and 16.6 lakh INR respectively. In the higher-density orchard (3000 trees/hectare), the net-revenue is 22.5 lakh INR which is substantially high. The payback period and the net-revenue albeit lower than the Italian counterparts, is significant and fairly consistent with the overall performance in the initial years of the Italian high-density orchards (Part I).

Cahn and Goedegebure (1992) had observed that the high-density orchards reach 60% of their full potential by the fifth year. Thus, the productivity or the yield per hectare will further increase in these orchards, even taking them closer to the yield per hectare of Italian orchards. Therefore, the production as well the net-revenue per annum is set to increase in all these orchards in the coming years which is beneficial for the development of the crop in Jammu and Kashmir.

IV. Conclusion

Trentino-Alto-Adige, Italy has shown considerable increase in its productivity as well as total production from past few decades on account of high-density apple orcharding. The early gestation period and the substantially higher productivity per tree favours the concept, leading to an early gestation period of just 5 years as compared to 8-9 years in traditional orcharding in Italy. Italy, therefore has been one of the important countries producing high-quality apples with substantially higher productivity. FAO (2013). In Jammu and Kashmir, the novelty of the concept has been received positively so far by the farmers. The productivity of the farmers has substantially improved from 11.43 tonnes/hectare to 23 tonnes/hectare in the fifth year of the scheme. Even in the lowest-density orchard, this productivity has risen to 1.5 times than the normal productivity over the years. Post 7th Year, the productivity is anticipated to reach to 50-60 tonnes/hectare. Even the payback period has been reduced to just five years from 11-12 years in the traditional years. Choure (2014). The low gestation period and therefore the early returns is beneficial for the small and marginal farmers, as it helps them mitigate the interest cost of their credits. The farmers claimed that the quality has improved which helps in better marketing of their product and fetches better price too. However, while comparing with the Italian counterparts the productivity is lower in all the densities. The reason for this might be the agro-climatic conditions, soil-health, quality of the rootstock and the scientific management of the crops overall. The upfront cost of the highest-density orchard is substantially high which forces the majority of the farmers (90 percent) to choose density between 1500-2000 trees/hectare.

The yield per hectare curve flattens out a bit in the lower-density orchards thus, these orchards may reach stagnation in ninth to eleventh (9-11) years which may stagnate the profits as well. However, this yield is steadily increasing in the higher-density orchards, therefore making them the best long-term choices for the farmers. Thus, higher-density orchards are better compared to the lower-density orchards. The orchards with density 4000trees/hectare in Italy infact have the highest yield per hectare and the returns are nearly twice than 1000trees/hectare in the seventh year. But unfortunately, not a single farmer has opted for this density as the cost-upfront is unaffordable.

The government needs to bring in concrete steps to address these concerns. First, there should be easy access to credit facilities for the farmers at affordable rates. Even a government subsidy upfront is

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feasible for the development of these high-density orchards, especially above 3000 trees/hectare. Second, nearly 80 percent of the farmers are in the small and marginal category, therefore Farmer Producer Organisations- FPOs will prove effective. These FPOs will help in development of clusters amongst farmers, pooling in their farms for better resource efficiency. Cooperative societies can also be brought in to club these small and marginal farmers and establish high-density orchards with proper standard of procedures. Overall, this will bring in resource-efficiency and help in improving the sector. Third, the agricultural extension services need to be very effective in disseminating scientific knowledge and information to the farmers for scientific management of these orchards. The high-density apple plantation scheme has started on a positive note and is treading on an upward trajectory with good growth projections which would enable to make Jammu and Kashmir as the horticultural hotspot of the country.

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Appendix A

Regression Analysis of the Orchard Combinations						
	2000 trees/hectare		3000 trees/hectare		4000 trees/hectare	
Independent Variables	Estimated Coefficients	p-Value	Estimated Coefficients	p-Value	Estimated Coefficients	p-Value
Plant-Material Cost	0.24	0.015*	0.31	0.0172*	0.29	0.0115*
Trellis and Irrigation Cost	0.21	0.052*	0.19	0.042*	0.11	0.045*
Land Development and Fencing	0.09	0.049*	0.11	0.0923*	0.1	0.079*
Fertlizers and Pesticides cost	0.12	0.018*	0.18	0.0112*	0.142	0.028*
Harvesting, Transportation and Supervision Cost	0.082	0.572**	0.11	0.231**	0.11	0.324**
Tree-Training Cost	0.045	0.7823**	0.05	0.533**	0.032	0.0223**
R-squared	0.9423		0.9139		0.9104	
*p<0.1, **p<0.05. ***p<0.01						

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Income Contribution of Non-Farm Activities towards Poverty Reduction among Rural Women in Kajuru Local Government Area of Kaduna State, Nigeria

By Onyebuchi Nneka

Abstract- This paper assessed the contributions of alternative income sources, other than farming, adopted by rural women, to understand their implication for poverty reduction. The study drew a sample of 382 rural women through a systematic sampling technique stratified into; women who engaged in farming activities only as their source of income on the one hand and women who engaged in farming and non-farm activities as their source of income. Data obtained were analyzed using relevant statistical packages and the Foster Greer Thorbecke (FGT) (1984) poverty measures. When total mean income of women that diversified their income was compared to those that were in farming alone, results established that there was significant difference between the incomes of women that adopted both farming and non-farming activities and those that were into farming alone, with poverty rates of 77.5% for the former and 80% for the later.

Keywords: *rural women; income; non-farm activities; poverty reduction.*

GJHSS-E Classification: *FOR Code: 149999*

INCOMECONTRIBUTIONOFNONFARMACTIVITIESTOWARDSPOVERTYREDUCTIONAMONGRURALWOMENINKAJURULOCALGOVERNMENTAREAOFKADUNA STATENIGERIA

Strictly as per the compliance and regulations of:

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The findings of this study suggest that rural women should be empowered to enable them access financial and other resources, with a view to enhancing their participation in non-farm activities.

Also education opportunities should be expanded because more of the educated women engage in high income generating non-farm activities.

Keywords: rural women; income; non-farm activities; poverty reduction.

I. Introduction

One important pathway towards livelihood sustainability involves avoidance of long-term dependency on only one income source (Block and Webb, 2001). For many decades now, agriculture has remained the main source of income and employment in rural areas of Nigeria and most households are involved in the farm sector. However, the non-farm sector is becoming increasingly important (Haggblade, Hazell and Reardon, 2002).

In any case, it is a universally accepted fact that the agricultural sector is, by itself, incapable of creating additional opportunities of gainful employment in the wake of increasing population coupled with the common approach to rural poverty reduction in Nigeria which relies almost entirely on the production of crops and livestock which depends solely on land and evidence show that the traditional land ownership system prevalent in Africa and Nigeria in particular do not encourage ownership of land by women (NBS, 2012). As a result, the impetus for achieving improved income in rural areas has to pivot around expanding the base of non-farm activities.

The other side of the coin is that agricultural activities in Nigeria is almost entirely rain-fed and the seasonality of rainfall in Nigeria influences agricultural production especially crop production which is prevalent in rural areas of Nigeria. Planting and harvesting occupy labour in peak seasons of farming activities; demand for farm labour is generally low during the rest of the year, hence the need for non-farm employment.

Incidence of poverty among women has attracted particular attention because women constitute the majority in rural areas (IFAD, 2016) and some of them are household heads catering for children, the aged and other vulnerable groups in the society. Participation in the rural non-farm activities allows poor people, women inclusive to offset fluctuations in agricultural income that usually occur on a seasonal basis or as a result of unexpected events such as flooding, this is especially the case where savings, credit and insurance mechanisms are not available for this purpose, as is the case in many rural areas of Nigeria.

It is estimated that 52% of the country's rural population are poor and women constitute 60% of this number (NBS, 2012) That being the case, it is critical that rural poverty is addressed in both poverty reduction strategies and, generally, as part of policies seeking to promote rural development. Correspondingly, it is important for developing countries and development organizations, in assessing approaches to rural development, not to view agriculture as the only basis for rural development, an approach which has neglected the contributions of other sectors and their effectiveness in reducing rural poverty and improving the quality of life of rural dwellers. It is therefore useful, when thinking about rural poverty reduction, to think of other rural income generating activities, to allow an understanding of the relationship between the various economic

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activities that take place in the rural space, and of their implications for income growth and poverty reduction.

Women involvement in non-farm activities is expected to lead to increase in income, release pressure on migration and tighten the labour supply for agriculture. The short term effects of rural non-farm income on food security are reasonably clear. Non-farm income provides the cash that enables a farm household to purchase food during drought, after a harvest shortfall or during difficult times. In this respect, the behavior of women in diversifying their sources of income and employment from solely agriculture to include non-agricultural, could be considered to be important requirement for rural poverty reduction in Nigeria. The objectives of this paper therefore examine the contributions of non-farm activities to poverty reduction among rural women in Kajuru Local Government Area of Kaduna State.

This paper is organized into five sections. The first is on the introduction, followed by literature review. Section three is on the materials and methods, the results and discussions follow in section four while the last section captures the conclusions and recommendations.

II. Review of Relared Literature

a) *Conceptual classifications on rural non-farm activities*

Reardon (2000) define non-farm as activity outside agriculture, while Marsland et al (2000) puts non-farm activities as those activities that are not agriculture or forestry or fisheries but includes trade of agricultural products. Farm activity means agricultural activity and non-farm activity is used synonymously with non-agricultural activity, to this end non-farm activities refer to those activities that are not agriculture or forestry or fisheries; however non-farm does include trade of agricultural products (Marsland *et al*., 2000). This paper, therefore considers nonfarm activities to include; artisanal mining, rural small and cottage industries, construction, commerce and trading, tailoring, hair dressing, basket weaving, restaurants and food vending. Others includes Poultry, Pottery, Personal and government services, retail of airtime, rope-making and in fact all other activities that are income-generating other than production of primary agricultural commodities.

The term rural is subject to a similar amount of debate; hence the practical solution is for researchers to make sure that the definition they have adopted is clearly stated. Finally, there is the unit of observation which are the women referring to the female gender in the society.

The World Bank's Development Report (2015), defines poverty as an unacceptable deprivation in human well-being that can comprise both physiological and social deprivation. Physiological deprivation involves the non-fulfillment of basic material or biological needs, including inadequate nutrition, health, education, and shelter. A person can be considered poor if he or she is unable to secure the goods and services to meet these basic material needs.

Poverty can also be defined as lack of material wellbeing, insecurity, social exclusion, psychological dismay, lack of freedom, and low self-esteem. According to the International Monetary Fund (IMF, 2014) poverty is pronounced deprivation in wellbeing comprising many dimension which includes low income and the inability to acquire the basic goods and services necessary for survival and dignity, while the united nations view poverty as the inability of getting choices and opportunities, a violation of human dignity and lack of capacity to participate effectively in society, in other words it means insecurity and powerlessness.

b) *Rural Non- farm Activities: Their Relative Importance within Rural Economies.*

Rural development has been pushed to the top of agenda in Nigeria's national development drive. There is growing interest in rural non-farm activities as research on rural economies is increasingly showing that rural people's livelihoods are derived from diverse sources and not overwhelmingly dependent on agriculture as previously believed. The existing literature points to a strong relationship between nonfarm employment and rural welfare (Ayevbuomwam, Poopola and Adeoti 2017, Dirven 2011, Kochurani 2005, Awoyemi 2011).

The upsurge of interest in rural development can be attributed to a number of events which had their origin in our colonial heritage and the unanticipated oil boom of the seventies. These were massive rural-urban drift of able bodied young men and women, declining productivity in agriculture, increasing food imports, growing unemployment and the widening gap, in welfare terms between the urban and rural areas. In addressing this imbalance, there is growing interest in rural non-farm activities as research on rural economies is increasingly showing that rural people's livelihoods are derived from diverse sources and not overwhelmingly dependent on agriculture as previously believed. Moreover, policy makers are turning their attention to the wider rural economy.

Other researchers have been interested in evidence on the relationship between nonfarm employment and income inequality (Adams and He 1995, Reardon *et al*., 1996; Canagarajah and Thomas, 2001).) found that sources of nonfarm incomes decrease income inequality.

Numerous studies indicate the importance of non-farm activities to rural incomes. Newman and Canagarajah (1999) found out that the rural non-farm is now more dynamic and important than previously believed. Reardon, (1997) documented small enterprise study that show that the typical rural household in Africa has more than one member employed in non-farm activity. Islam, (1997) reported that the share of the non-farm sector in rural employment in developing countries varies from 20% to 50%. In Africa, the average share of rural non-farm incomes as a proportion of total rural incomes, at 42%, is higher than in Latin America and higher still in Asia (Reardon *et al,* 1998). Most evidence shows that rural non-farm activity in Africa is fairly evenly divided across commerce, manufacturing and services, linked directly to local agriculture, and is largely informal rather than formal (Reardon, 1997).

Several factors are responsible for women participation in non-farm activities, ranging from inadequate access to farm land, improved seedling, fertilizers, pesticides, agricultural finance, to long absence from the farm due to maternal activities.

There are many ways in which rural non-farm activities are important to rural areas, for instance cottage industries enable women to combine income generating activities with other tasks, such as food preparation and childcare. Households with greater income diversification are able to buy food and weather the effects of the drought and also tended to have higher overall incomes than those that were not able to supplement their farm incomes with non-farm incomes. There is general consensus that non-farm employment, helps to stimulate the rural economy, will lead to the reduction of rural income inequality and, as a result, social and political tensions.

Non-farm income compensates for a bad harvest or insufficient land. In other words, for a given woman with a given level of farm income, an increase in non-farm income clearly raises total income by the same amount enriching the woman and compensating a drop in agricultural production. As far as nonfarm income is concerned, women participate to a greater degree in wholesale or retail trade or in local crafts, than in other sectors. Existing patterns of rural non-farm participation suggest substantial entry barriers faced by women, so women also tend to engage in businesses that require lower start-up capital.

On the evidence of the relationship between the share of non-farm income in total household income, Reardon's (1997) review found that RNF income was more important to the higher income households, however there were also examples where opposite was true, indicating comparable importance of RNF income to total income to both the poorest and the least poor households (e.g. Northern Nigeria). Although statistics on poverty level of women in Kajuru local Government Area is not only lacking, the roles played by these non-farm activities will provide necessary data on which poverty reduction through non-farm endeavours can be built on.

Therefore an attempt is being made to establish the quantitative importance of this sector and to ask the question: whether these activities are productive enough to ensure the women a decent income and level of living; or are non-farm activities of a mere residual nature to which women turn merely as a last resort? It is also relevant with respect to the growing body of research which seeks to replace earlier, simplistic structural adjustment programmes with more sustainable livelihood approaches.

III. Materials and Methods

a) *Study Area*

Kajuru LGA is located in Kaduna State of Northern Nigeria, carved out of chikun local government area kajuru is located between latitude 9059' and 10035' North of the Equator and Longitude 7034' and 8013' east of the Greenwich Meridian (Kajuru, 2010). The study area is predominantly rural with a population of about 110868(NPC, 2007), the people in the area therefore are traditionally small scale farmers.

b) *Data Sources and Sampling Techniques*

The sources of data are mainly from primary sources using structured questionnaire, feil observations and interviews. The primary data are complimented by secondary information from journals, conference papers and existing literature on subject matter.

The population of women in the LGA is about 55,304 and Based on the sample size table by Krejcie and Morgan (1970), 382 women were selected from 55,304 women population as adequate representation. 10 settlements were purposively selected and 38 questionnaires were administered systematically at intervals of three in each settlement.

Table 1: Settlements and Corresponding Sample Size.

Settlements	Corresponding sample size
Afogo	38
Budah	38
Dutsengaiya	38
Idon	38
Kajuru	40
Kallah	38

Kasuwa-mageni	38
Kemara	38
Kufana	38
Rimau	38
Total	382

Source: Authors Survey

However additional 2 questionnaires were added to kajuru as the local government headquarters in order to make-up the sample size giving a total of 382 respondents; this is because figures for women population by settlement in the study area are yet to be published. The respondents were stratified into two: Regime 1: women who generate both non-farm income and farm income; Regime 2: women who generate only farm income, giving 191 respondents on each side

c) *Analytical Technique*

Both descriptive and inferential statistics is used in analyzing data, including simple percentages, tables and graphs. The Foster Greer Thorbecke (FGT) (1984) weighted poverty measure is used to examine the incidence of poverty among the women, adopting the relative poverty line, using the formula:

$$P\alpha=1Ni=1nZ\text{-}YiZ^{\alpha}$$

IV. Results and Discussion

a) *Socio-economic Characteristics of Respondents*

The socio-economic characteristics of the respondents in the study area are shown in Table 2.

Table 2: Socio-economic Characteristics of Respondents

Age	Frequency (N=383)	Percentage (%)
20-29	90	23.5
30-39	147	38.5
40-49	123	32.2
50 and above	22	5.8
Marital Status		
Never Married	24	6.5
Married	308	80.4
Separated	11	2.9
Divorced	7	1.8
Widowed	31	8.1
Educational Qualification		
No formal education	31	8.1
Qu'aranic education	44	11.5
Primary education	74	19.3
Adult education	40	10.4
Secondary education	141	36.8
Tertiary	52	13.6
Primary Occupation		
Farming only	191	50
Farming and non-farming	191	50

Source: Author's survey

Age 30-39 years constitute the highest proportion of respondents, while age 50 and above ranked least. This may be because the younger women understood the reason for the survey and were more akin to respond to the questions.

Majority of the respondents (80.4%) were married, with the resultant effect on increased number of household size which is needful both for farm and non-farm labour. A small proportion of 6.5% never married. On the educational attainment of the respondents also on table 4.1 the highest number of the respondents had secondary education and this may be attributed to the unavailability of higher education institutions in the area.

b) *Activities of Women*

Table 3 X-rays the nature of crop production among the two income groups focused in this study. It can be deduced that major disparities occur in all the factors considered, between women who take up both farm and non-farm activities and women who engage in farming alone.

Table 3: Nature of Crop Production of Respondents

Factor	Primary Occupation			
	Farm and non-farm		Farming Only	
Number of Crops Grown	Frequency	(%)	Frequency	%
One crop only	33	49.3	34	50.7
Two crops	90	46.4	104	53.6
More than two crops	15	12.4	106	87.6
Production Level				
Subsistence	50	89.3	6	10.7
Commercial	137	42	189	57.9
Time for Selling Crops				
Before harvest	6	-	-	-
After harvest	12	3.8	300	96.2
Months after harvest	54	84.4	10	15.6

Source: Author's survey

In the number of crops cultivated, the women in farming activities only had the highest frequencies perhaps because they may have some comparative advantage in that they focus their energy and resource to the farms alone without divided attention, unlike women who combine the two occupations with the attendant fluctuation that may arise, from sourcing of inputs. In the case of production level, the frequencies of women at commercial level of production were more among those in farming alone. The women in their response during interview attributed it to the fact that since farming was their only source of income they believe that the larger the scale, the more the income. But coming to the time of sale of produce, the majority of the women engaged in farm and non-farm activities sold their produce months after harvest, thereby earning more income because field observation show that prizes of produce tend to be higher months after harvest. This is in tandem with the findings of Mwabu and Thorbecke (2011), that non-farm earning increases household income. On the other hand majority of respondents in farming alone sell their crops immediately after harvest, which may be attributed to the level of monetary need and poverty which compel farmers to sale their produce immediately after harvest to satisfy basic needs.

c) Non-farm activities and income

Non-farm activities have become an important alternative income source for rural households in most developing countries like Nigeria.

Table 4 presents the non-farm activities engaged in by respondents in the study area, g supporting the views of Oladeji, Olujide, and Oyesola, (2006) that even though farming was the predominant activity in most rural areas, farmers including women usually engage in supplementary activities.

The types of non-farm activities engaged in by respondents include; tailoring; trading; Basketry-weaving; potter; rope-making; restaurant and food-vending, sales of GSM airtime vouchers, poultry keeping and hairdressing, corroborating the views of Haggblade *et al* (2007) that as far as nonfarm income is concerned, women participate to a greater degree in wholesale or retail trade or in local crafts, than in other sectors, there is also the fact of fewer entry barriers faced. Ranking the least is Rope-making, with only 1.0%, it was observed in the area that rope-making was a male dominated trade.

Table 4: Non-farming activity and Income Contribution

Non-farm activity	Average yearly income					Freq	Percentage (%)
	2012	2013	2014	2015	2016		
Tailoring	31481.48	37379.31	30827.59	39068.97	33637.93	33	11.75
Hair dressing	23281.25	37343.75	24055.56	36500.00	30777.78	15	10.36
Trading	27331.25	35375.00	30625.00	36931.25	38046.20	60	11.47
Basketry	10000.00	25250.00	30250.00	35500.00	37750.00	4	9.46
R/food vending	27592.60	33046.30	31379.63	33129.63	33342.59	38	10.80
Rope making	10000.00	25250.00	15250.00	15250.00	42750.00	2	7.39
Pottery	22333.33	23444.44	23444.44	32111.11	33722.22	8	9.20
Sales of airtime	23000.00	35035.71	20750.00	36533.33	27066.67	7	9.70
Poultry keeping	28454.54	33923.08	29730.77	40153.85	38884.62	18	11.66
Others	20000.00	21750.00	23416.67	25166.67	30083.33	6	8.21
Total							100.0

Source: Authors Survey

d) *Reasons for engaging in non-farm activities*

The results of the reasons adduced by the respondents, as to why they take up non-farm activities are presented in table 5.

Majority of the respondents (79.6%) engaged in non-farm activities to generate more income, 18.3% represents those who do so to cope with farming related shocks. This agreed with Ellis and Freeman (2004) that the reason for income diversification includes declining farm income and the desire to insure against agricultural production and market risks.

The source of start-up capital for non-farm activities as revealed by the women is largely between loan from family and friends and income from farm produce with 52.9% and 36.1% respectively. This may be because these two sources do not require documented collaterals.

As regards the amount of initial startup capital, the highest number of respondents representing about 44% started their businesses with less than eleven thousand naira (#11,000), underlying the fact that women have limited access to credits, especially in the rural areas, and highlights the importance of informal sources of funds available from family and friends. These are however inadequate, since household expenditure follows a similar pattern in rural areas, with everyone's need to be satisfied at the same time, i.e. when food supplies are running low and the next crop is not yet ready for harvesting. 19.9% started with above #20,000, while 24.6% started with less than #16,000.

Table 5: Reasons for Engaging in Non-farm Activities

Reasons	Frequency	Percentage (%)
To cope with farming related shocks	35	18.3
To generate more income	152	79.6
Leisure	-	-
Others	4	2.1
Source of start-up fund		
Income from farm produce	69	36.1
Money lender	11	5.8
Loan from family and friends	101	52.9
Others	10	5.2
Amount for Initial investment		
5,000-10,000	84	44
11,000-15,000	47	24.6
16,000-20,000	19	9.9
Above 20,000	38	19.9
Others	3	1.6
Barrier to non-farming activities		
Inadequate capital	118	61.8
Competition from external market	39	20.4
None	30	15.7
Others	4	2.1

Source: Authors Survey

Table 5 also indicate that 68.1% of the respondents find inadequate capital to be the most challenging barrier of engaging in non-farming activities, while 20.4% were of the view that competition from external market was their main problem. Overall this reflects the incidence of poverty in the area and the small scale nature of non-farming activities engaged by women in the study area.

e) Incidence of Poverty among Women

While the rural sector carries over 50% of the country's population and the bulk of its natural resources (NBS, 2018), its communities are subsisting under poor conditions devoid of opportunities and options within environments lacking in basic facilities such as roads, water supply and sanitation, energy and communication. In Nigeria, non-farm incomes represent an important element in the livelihood of the poor. In several areas the depletion of natural resources are such that agriculture cannot possibly remain the only, or even the main source of income. it is a universally accepted fact that agricultural sector is incapable of creating sufficient gainful employment opportunities amidst of increasing population in the developing countries.. Despite poverty-reduction strategies adopted in Nigeria, the incidence of poverty in rural areas still remains high (NBS, 2018).

f) Distribution of Women Income (2012-2016)

Table 6 shows the income generated by the rural women from both Regimes in the years under study. Regime 1 (farm and non-farm activities income); Regime 2 (farm activities income).

The paired sample statistics shown in Table 6 reveals that in 2014 the, rural women recorded the highest mean income. Many of the women acknowledged that this was due to favourable climatic conditions, citing that both the onset and cessation of the rain happened in good time, and because agriculture in the area was largely rain fed it led to bumper harvest.

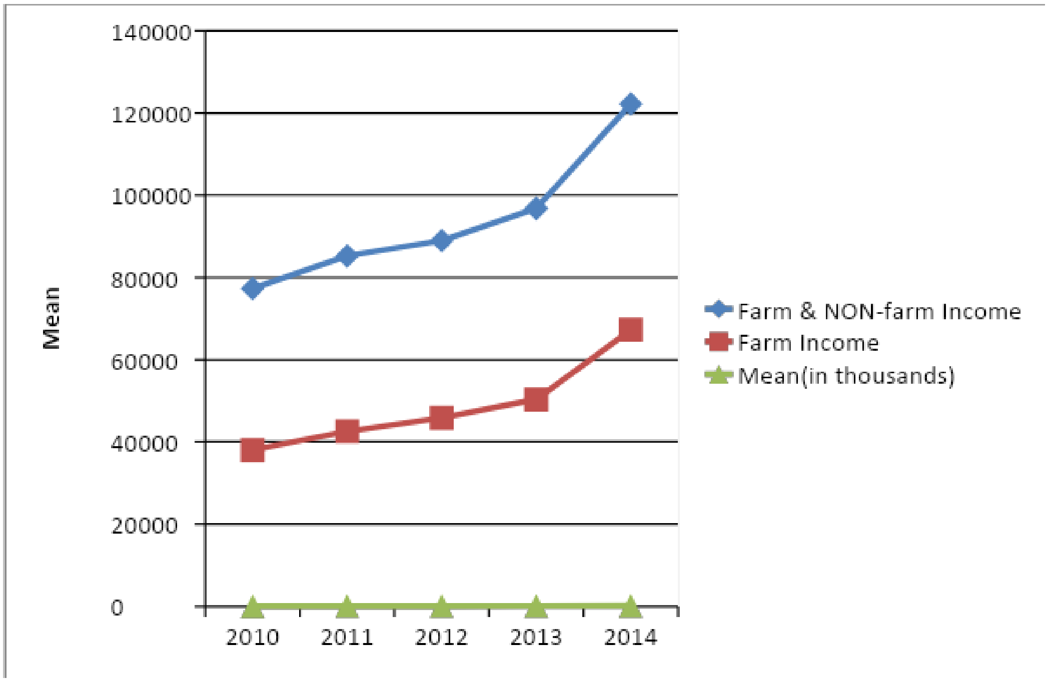
Others attributed it to the increased demand due to increased population witnessed in the area, as many indigenes residing outside the area returned home to escape any undesirable aftermath that may arise due to the general elections scheduled in 2015 which usually escalates in towns and cities more than in the rural areas.

Table 6: Mean Annual Income of Respondents (2012-2016)

Year	Type of Income	Mean	in Naira %	Standard Deviation
Year 2012	Farm and N/F	77.3053	67.0	30.43201
	Farm only	38.0000	33.0	13.10115
Year 2013	Farm and N/F	85.2316	66.6	36.31052
	Farm only	42.5737	33.4	16.56995
Year 2014	Farm and N/F	88.9474	65.9	38.42394
	Farm only	45.8526	34.1	20.22700
Year 2015	Farm and N/F	96.7737	65.7	48.33532
	Farm only	50.3263	34.3	32.18036
Year 2016	Farm and N/F	122.2211	64.5	60.95947
	Farm only	67.2632	35.5	52.69343

Source: Authors Survey

However in the duration of study (2012-2016) the average mean income of women in farm and non-farm activities was seen to be higher in all the years, which agrees with the findings of Mwabu and Thorbecke (2001) that rural non-farm earnings increases total income.



Source: Authors computation

Figure 4 3: Mean income of respondents (2010-2014)

g) Poverty incidence by type of employment

In an attempt to answer whether the movement to rural non-farm activity is poverty reducing, we drew upon the results from the tables above to show how participation in non-farm activities contributed to the income of the rural women. The standard Foster-Greer-Thorbecke (FGT) (1984) ratios were estimated for each of the two income groups. Here attention was given primarily to the comparison of poverty in the two income groups over the study period. The Table 7 represents the income of the respondents from the two regimes. On average women make up 43% of farming labour in developing countries, including Nigeria (Ayevbuomwam *et al,* 2017). In the rural areas, households involved in agricultural activities are more likely to be poor, mostly due to lack of access to productive assets Table 4.11 shows the annual income generated by the rural women.

Table 7: Descriptive statistics of women income

Year	Farm & Non-farm Income		Farm Income	
	Minimum	Maximum	Minimum	Maximum
2012	25000	430000	5000	95000
2013	25000	440000	10000	150000
2014	25000	600000	12000	600000
2015	25000	570000	5000	300000
2016	21000	360000	10000	80000

Source: Author's computation

Table 7 reveals that the highest minimum income in farming activities, of ₦12, 000 was got in the year 2014, while the least was in 2016, amounting to ₦10000. This is however lower than the national average of ₦45, 250 in Nigeria (NBS, 2010), but is a representative figure for households located in rural areas of Nigeria

The lowest minimum income of women, adopting both farming and non-farming activities as their source of income, according to the above table were recorded in 2016, while the highest maximum was in 2014. The reason for the lowest maximum income in 2016 may not be far from the recession witnessed in the country in 2016, while the highest was in 2014. This may be because as the years go by women improved in the activities they were engaged in. there was also a wide recognition among the women of a significant improvement in the access to inputs like fertilizer among the farmers, and increased opportunities for acquisition of skills and training by both the public and private organizations.

h) Values of Incidence of poverty by Occupation

Previous poverty studies in Nigeria have used a relative measure of poverty. The relative poverty line was based on two-thirds of the mean income.

Table 8: Distribution of poverty by occupation

Occupation	Total Population	Mean Income (#)	2/3 0f Mean Income
Farm and Non-farm (Regime 1)	191	940958	627305
Farming only (Regime 2)	191	488032	325354

Regime 1: Po1$\frac{n}{N}$ *this gives a poverty incidence of 77.5%*

Regime 2: Po2$\frac{n}{N}$ *this gives a poverty incidence of 80%*

V. Conclusion

The idea that rural areas are synonymous with agriculture is widespread; however there is a growing recognition that the rural non-farm activities play a vital role in the economies of rural dwellers, because agriculture alone cannot bear the burden of poverty reduction in rural areas. The seasonality of agricultural activities and the resultant migration of labour give rise to the need for non-farm activities. Field observations show that women farmers face a constant struggle for reasons of differential in prevalent land tenure systems, long absence from the farm due to maternal activities, unremunerated domestic activities like fetching of water and firewood among others.

In assessing the contribution of non-farm income generating activities to women income towards reduction of poverty, it was found indeed that non-farm activities generate more income for the women helping in coping with shocks which usually emanate from poor yields and natural disasters and leading to poverty reduction.

VI. Recommendations

The rural poor who are mostly women experience challenging entry barriers to non-farm income generating activities which further compound their poverty. This paper suggests that if income from non-farm activities could be increased through expansion of women's access to credits and other financial resources to enable them expand the base of their non-farm income generating activity, it could help in further reducing poverty among the women. This paper further recommends that increased investments in education of the women especially in skills acquisition will improve and expand their participation in high income return non-farm activity like tailoring.

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ASSOCIATE OF SOCIAL SCIENCE RESEARCH COUNCIL is the membership of Global Journals awarded to individuals that the Open Association of Research Society judges to have made a 'substantial contribution to the improvement of computer science, technology, and electronics engineering.

> The primary objective is to recognize the leaders in research and scientific fields of the current era with a global perspective and to create a channel between them and other researchers for better exposure and knowledge sharing. Members are most eminent scientists, engineers, and technologists from all across the world. Associate membership can later be promoted to Fellow Membership. Associates are elected for life through a peer review process on the basis of excellence in the respective domain. There is no limit on the number of new nominations made in any year. Each year, the Open Association of Research Society elect up to 12 new Associate Members.

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Financial

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Organize seminar/conference

Associates are authorized to organize symposium/seminar/conference on behalf of Global Journal Incorporation (USA). They can also participate in the same organized by another institution as representative of Global Journal. In both the cases, it is mandatory for him to discuss with us and obtain our consent. Additionally, they get free research conferences (and others) alerts.

Career Credibility Financial

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Associate members are eligible to join as a paid peer reviewer at Global Journals Incorporation (USA) and can get a remuneration of 15% of author fees, taken from the author of a respective paper.

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Associate	Fellow	Research Group	Basic
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Certificate, LoR and Momento 2 discounted publishing/year **Gradation** of Research 10 research contacts/day 1 **GB** Cloud Storage **GJ** Community Access	**Certificate,** LoR and Momento **Unlimited** discounted publishing/year **Gradation** of Research **Unlimited** research contacts/day 5 **GB** Cloud Storage **Online Presense** Assistance **GJ** Community Access	**Certificates,** LoRs and Momentos **Unlimited** free publishing/year **Gradation** of Research **Unlimited** research contacts/day **Unlimited** Cloud Storage **Online Presense** Assistance **GJ** Community Access	**GJ** Community Access

Preferred Author Guidelines

We accept the manuscript submissions in any standard (generic) format.

We typeset manuscripts using advanced typesetting tools like Adobe In Design, CorelDraw, TeXnicCenter, and TeXStudio. We usually recommend authors submit their research using any standard format they are comfortable with, and let Global Journals do the rest.

Alternatively, you can download our basic template from https://globaljournals.org/Template.zip

Authors should submit their complete paper/article, including text illustrations, graphics, conclusions, artwork, and tables. Authors who are not able to submit manuscript using the form above can email the manuscript department at submit@globaljournals.org or get in touch with chiefeditor@globaljournals.org if they wish to send the abstract before submission.

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Authors must ensure the information provided during the submission of a paper is authentic. Please go through the following checklist before submitting:

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2. Authors must accept the privacy policy, terms, and conditions of Global Journals.
3. Ensure corresponding author's email address and postal address are accurate and reachable.
4. Manuscript to be submitted must include keywords, an abstract, a paper title, co-author(s') names and details (email address, name, phone number, and institution), figures and illustrations in vector format including appropriate captions, tables, including titles and footnotes, a conclusion, results, acknowledgments and references.
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7. Manuscript submitted *must not have been submitted or published elsewhere* and all authors must be aware of the submission.

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It is required for authors to declare all financial, institutional, and personal relationships with other individuals and organizations that could influence (bias) their research.

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2. Drafting the paper and revising it critically regarding important academic content.
3. Final approval of the version of the paper to be published.

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Appealing Decisions

Unless specified in the notification, the Editorial Board's decision on publication of the paper is final and cannot be appealed before making the major change in the manuscript.

Acknowledgments

Contributors to the research other than authors credited should be mentioned in Acknowledgments. The source of funding for the research can be included. Suppliers of resources may be mentioned along with their addresses.

Declaration of funding sources

Global Journals is in partnership with various universities, laboratories, and other institutions worldwide in the research domain. Authors are requested to disclose their source of funding during every stage of their research, such as making analysis, performing laboratory operations, computing data, and using institutional resources, from writing an article to its submission. This will also help authors to get reimbursements by requesting an open access publication letter from Global Journals and submitting to the respective funding source.

Preparing your Manuscript

Authors can submit papers and articles in an acceptable file format: MS Word (doc, docx), LaTeX (.tex, .zip or .rar including all of your files), Adobe PDF (.pdf), rich text format (.rtf), simple text document (.txt), Open Document Text (.odt), and Apple Pages (.pages). Our professional layout editors will format the entire paper according to our official guidelines. This is one of the highlights of publishing with Global Journals—authors should not be concerned about the formatting of their paper. Global Journals accepts articles and manuscripts in every major language, be it Spanish, Chinese, Japanese, Portuguese, Russian, French, German, Dutch, Italian, Greek, or any other national language, but the title, subtitle, and abstract should be in English. This will facilitate indexing and the pre-peer review process.

The following is the official style and template developed for publication of a research paper. Authors are not required to follow this style during the submission of the paper. It is just for reference purposes.

Manuscript Style Instruction (Optional)

- Microsoft Word Document Setting Instructions.
- Font type of all text should be Swis721 Lt BT.
- Page size: 8.27" x 11'", left margin: 0.65, right margin: 0.65, bottom margin: 0.75.
- Paper title should be in one column of font size 24.
- Author name in font size of 11 in one column.
- Abstract: font size 9 with the word "Abstract" in bold italics.
- Main text: font size 10 with two justified columns.
- Two columns with equal column width of 3.38 and spacing of 0.2.
- First character must be three lines drop-capped.
- The paragraph before spacing of 1 pt and after of 0 pt.
- Line spacing of 1 pt.
- Large images must be in one column.
- The names of first main headings (Heading 1) must be in Roman font, capital letters, and font size of 10.
- The names of second main headings (Heading 2) must not include numbers and must be in italics with a font size of 10.

Structure and Format of Manuscript

The recommended size of an original research paper is under 15,000 words and review papers under 7,000 words. Research articles should be less than 10,000 words. Research papers are usually longer than review papers. Review papers are reports of significant research (typically less than 7,000 words, including tables, figures, and references)

A research paper must include:

a) A title which should be relevant to the theme of the paper.
b) A summary, known as an abstract (less than 150 words), containing the major results and conclusions.
c) Up to 10 keywords that precisely identify the paper's subject, purpose, and focus.
d) An introduction, giving fundamental background objectives.
e) Resources and techniques with sufficient complete experimental details (wherever possible by reference) to permit repetition, sources of information must be given, and numerical methods must be specified by reference.
f) Results which should be presented concisely by well-designed tables and figures.
g) Suitable statistical data should also be given.
h) All data must have been gathered with attention to numerical detail in the planning stage.

Design has been recognized to be essential to experiments for a considerable time, and the editor has decided that any paper that appears not to have adequate numerical treatments of the data will be returned unrefereed.

i) Discussion should cover implications and consequences and not just recapitulate the results; conclusions should also be summarized.
j) There should be brief acknowledgments.
k) There ought to be references in the conventional format. Global Journals recommends APA format.

Authors should carefully consider the preparation of papers to ensure that they communicate effectively. Papers are much more likely to be accepted if they are carefully designed and laid out, contain few or no errors, are summarizing, and follow instructions. They will also be published with much fewer delays than those that require much technical and editorial correction.

The Editorial Board reserves the right to make literary corrections and suggestions to improve brevity.

Format Structure

It is necessary that authors take care in submitting a manuscript that is written in simple language and adheres to published guidelines.

All manuscripts submitted to Global Journals should include:

Title

The title page must carry an informative title that reflects the content, a running title (less than 45 characters together with spaces), names of the authors and co-authors, and the place(s) where the work was carried out.

Author details

The full postal address of any related author(s) must be specified.

Abstract

The abstract is the foundation of the research paper. It should be clear and concise and must contain the objective of the paper and inferences drawn. It is advised to not include big mathematical equations or complicated jargon.

Many researchers searching for information online will use search engines such as Google, Yahoo or others. By optimizing your paper for search engines, you will amplify the chance of someone finding it. In turn, this will make it more likely to be viewed and cited in further works. Global Journals has compiled these guidelines to facilitate you to maximize the web-friendliness of the most public part of your paper.

Keywords

A major lynchpin of research work for the writing of research papers is the keyword search, which one will employ to find both library and internet resources. Up to eleven keywords or very brief phrases have to be given to help data retrieval, mining, and indexing.

One must be persistent and creative in using keywords. An effective keyword search requires a strategy: planning of a list of possible keywords and phrases to try.

Choice of the main keywords is the first tool of writing a research paper. Research paper writing is an art. Keyword search should be as strategic as possible.

One should start brainstorming lists of potential keywords before even beginning searching. Think about the most important concepts related to research work. Ask, "What words would a source have to include to be truly valuable in a research paper?" Then consider synonyms for the important words.

It may take the discovery of only one important paper to steer in the right keyword direction because, in most databases, the keywords under which a research paper is abstracted are listed with the paper.

Numerical Methods

Numerical methods used should be transparent and, where appropriate, supported by references.

Abbreviations

Authors must list all the abbreviations used in the paper at the end of the paper or in a separate table before using them.

Formulas and equations

Authors are advised to submit any mathematical equation using either MathJax, KaTeX, or LaTeX, or in a very high-quality image.

Tables, Figures, and Figure Legends

Tables: Tables should be cautiously designed, uncrowned, and include only essential data. Each must have an Arabic number, e.g., Table 4, a self-explanatory caption, and be on a separate sheet. Authors must submit tables in an editable format and not as images. References to these tables (if any) must be mentioned accurately.

Figures

Figures are supposed to be submitted as separate files. Always include a citation in the text for each figure using Arabic numbers, e.g., Fig. 4. Artwork must be submitted online in vector electronic form or by emailing it.

Preparation of Eletronic Figures for Publication

Although low-quality images are sufficient for review purposes, print publication requires high-quality images to prevent the final product being blurred or fuzzy. Submit (possibly by e-mail) EPS (line art) or TIFF (halftone/ photographs) files only. MS PowerPoint and Word Graphics are unsuitable for printed pictures. Avoid using pixel-oriented software. Scans (TIFF only) should have a resolution of at least 350 dpi (halftone) or 700 to 1100 dpi (line drawings). Please give the data for figures in black and white or submit a Color Work Agreement form. EPS files must be saved with fonts embedded (and with a TIFF preview, if possible).

For scanned images, the scanning resolution at final image size ought to be as follows to ensure good reproduction: line art: >650 dpi; halftones (including gel photographs): >350 dpi; figures containing both halftone and line images: >650 dpi.

Color charges: Authors are advised to pay the full cost for the reproduction of their color artwork. Hence, please note that if there is color artwork in your manuscript when it is accepted for publication, we would require you to complete and return a Color Work Agreement form before your paper can be published. Also, you can email your editor to remove the color fee after acceptance of the paper.

Tips for writing a good quality Social Science Research Paper

Techniques for writing a good quality homan social science research paper:

1. Choosing the topic: In most cases, the topic is selected by the interests of the author, but it can also be suggested by the guides. You can have several topics, and then judge which you are most comfortable with. This may be done by asking several questions of yourself, like "Will I be able to carry out a search in this area? Will I find all necessary resources to accomplish the search? Will I be able to find all information in this field area?" If the answer to this type of question is "yes," then you ought to choose that topic. In most cases, you may have to conduct surveys and visit several places. Also, you might have to do a lot of work to find all the rises and falls of the various data on that subject. Sometimes, detailed information plays a vital role, instead of short information. Evaluators are human: The first thing to remember is that evaluators are also human beings. They are not only meant for rejecting a paper. They are here to evaluate your paper. So present your best aspect.

2. Think like evaluators: If you are in confusion or getting demotivated because your paper may not be accepted by the evaluators, then think, and try to evaluate your paper like an evaluator. Try to understand what an evaluator wants in your research paper, and you will automatically have your answer. Make blueprints of paper: The outline is the plan or framework that will help you to arrange your thoughts. It will make your paper logical. But remember that all points of your outline must be related to the topic you have chosen.

3. Ask your guides: If you are having any difficulty with your research, then do not hesitate to share your difficulty with your guide (if you have one). They will surely help you out and resolve your doubts. If you can't clarify what exactly you require for your work, then ask your supervisor to help you with an alternative. He or she might also provide you with a list of essential readings.

4. Use of computer is recommended: As you are doing research in the field of homan social science then this point is quite obvious. Use right software: Always use good quality software packages. If you are not capable of judging good software, then you can lose the quality of your paper unknowingly. There are various programs available to help you which you can get through the internet.

5. Use the internet for help: An excellent start for your paper is using Google. It is a wondrous search engine, where you can have your doubts resolved. You may also read some answers for the frequent question of how to write your research paper or find a model research paper. You can download books from the internet. If you have all the required books, place importance on reading, selecting, and analyzing the specified information. Then sketch out your research paper. Use big pictures: You may use encyclopedias like Wikipedia to get pictures with the best resolution. At Global Journals, you should strictly follow here.

6. Bookmarks are useful: When you read any book or magazine, you generally use bookmarks, right? It is a good habit which helps to not lose your continuity. You should always use bookmarks while searching on the internet also, which will make your search easier.

7. Revise what you wrote: When you write anything, always read it, summarize it, and then finalize it.

8. Make every effort: Make every effort to mention what you are going to write in your paper. That means always have a good start. Try to mention everything in the introduction—what is the need for a particular research paper. Polish your work with good writing skills and always give an evaluator what he wants. Make backups: When you are going to do any important thing like making a research paper, you should always have backup copies of it either on your computer or on paper. This protects you from losing any portion of your important data.

9. Produce good diagrams of your own: Always try to include good charts or diagrams in your paper to improve quality. Using several unnecessary diagrams will degrade the quality of your paper by creating a hodgepodge. So always try to include diagrams which were made by you to improve the readability of your paper. Use of direct quotes: When you do research relevant to literature, history, or current affairs, then use of quotes becomes essential, but if the study is relevant to science, use of quotes is not preferable.

10. Use proper verb tense: Use proper verb tenses in your paper. Use past tense to present those events that have happened. Use present tense to indicate events that are going on. Use future tense to indicate events that will happen in the future. Use of wrong tenses will confuse the evaluator. Avoid sentences that are incomplete.

11. Pick a good study spot: Always try to pick a spot for your research which is quiet. Not every spot is good for studying.

12. Know what you know: Always try to know what you know by making objectives, otherwise you will be confused and unable to achieve your target.

13. Use good grammar: Always use good grammar and words that will have a positive impact on the evaluator; use of good vocabulary does not mean using tough words which the evaluator has to find in a dictionary. Do not fragment sentences. Eliminate one-word sentences. Do not ever use a big word when a smaller one would suffice.

Verbs have to be in agreement with their subjects. In a research paper, do not start sentences with conjunctions or finish them with prepositions. When writing formally, it is advisable to never split an infinitive because someone will (wrongly) complain. Avoid clichés like a disease. Always shun irritating alliteration. Use language which is simple and straightforward. Put together a neat summary.

14. Arrangement of information: Each section of the main body should start with an opening sentence, and there should be a changeover at the end of the section. Give only valid and powerful arguments for your topic. You may also maintain your arguments with records.

15. Never start at the last minute: Always allow enough time for research work. Leaving everything to the last minute will degrade your paper and spoil your work.

16. Multitasking in research is not good: Doing several things at the same time is a bad habit in the case of research activity. Research is an area where everything has a particular time slot. Divide your research work into parts, and do a particular part in a particular time slot.

17. Never copy others' work: Never copy others' work and give it your name because if the evaluator has seen it anywhere, you will be in trouble. Take proper rest and food: No matter how many hours you spend on your research activity, if you are not taking care of your health, then all your efforts will have been in vain. For quality research, take proper rest and food.

18. Go to seminars: Attend seminars if the topic is relevant to your research area. Utilize all your resources.
Refresh your mind after intervals: Try to give your mind a rest by listening to soft music or sleeping in intervals. This will also improve your memory. Acquire colleagues: Always try to acquire colleagues. No matter how sharp you are, if you acquire colleagues, they can give you ideas which will be helpful to your research.

19. Think technically: Always think technically. If anything happens, search for its reasons, benefits, and demerits. Think and then print: When you go to print your paper, check that tables are not split, headings are not detached from their descriptions, and page sequence is maintained.

20. Adding unnecessary information: Do not add unnecessary information like "I have used MS Excel to draw graphs." Irrelevant and inappropriate material is superfluous. Foreign terminology and phrases are not apropos. One should never take a broad view. Analogy is like feathers on a snake. Use words properly, regardless of how others use them. Remove quotations. Puns are for kids, not grunt readers. Never oversimplify: When adding material to your research paper, never go for oversimplification; this will definitely irritate the evaluator. Be specific. Never use rhythmic redundancies. Contractions shouldn't be used in a research paper. Comparisons are as terrible as clichés. Give up ampersands, abbreviations, and so on. Remove commas that are not necessary. Parenthetical words should be between brackets or commas. Understatement is always the best way to put forward earth-shaking thoughts. Give a detailed literary review.

21. Report concluded results: Use concluded results. From raw data, filter the results, and then conclude your studies based on measurements and observations taken. An appropriate number of decimal places should be used. Parenthetical remarks are prohibited here. Proofread carefully at the final stage. At the end, give an outline to your arguments. Spot perspectives of further study of the subject. Justify your conclusion at the bottom sufficiently, which will probably include examples.

22. Upon conclusion: Once you have concluded your research, the next most important step is to present your findings. Presentation is extremely important as it is the definite medium though which your research is going to be in print for the rest of the crowd. Care should be taken to categorize your thoughts well and present them in a logical and neat manner. A good quality research paper format is essential because it serves to highlight your research paper and bring to light all necessary aspects of your research.

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Informal Guidelines of Research Paper Writing

Key points to remember:

- Submit all work in its final form.
- Write your paper in the form which is presented in the guidelines using the template.
- Please note the criteria peer reviewers will use for grading the final paper.

Final points:

One purpose of organizing a research paper is to let people interpret your efforts selectively. The journal requires the following sections, submitted in the order listed, with each section starting on a new page:

The introduction: This will be compiled from reference matter and reflect the design processes or outline of basis that directed you to make a study. As you carry out the process of study, the method and process section will be constructed like that. The results segment will show related statistics in nearly sequential order and direct reviewers to similar intellectual paths throughout the data that you gathered to carry out your study.

The discussion section:

This will provide understanding of the data and projections as to the implications of the results. The use of good quality references throughout the paper will give the effort trustworthiness by representing an alertness to prior workings.

Writing a research paper is not an easy job, no matter how trouble-free the actual research or concept. Practice, excellent preparation, and controlled record-keeping are the only means to make straightforward progression.

General style:

Specific editorial column necessities for compliance of a manuscript will always take over from directions in these general guidelines.

To make a paper clear: Adhere to recommended page limits.

Mistakes to avoid:

- Insertion of a title at the foot of a page with subsequent text on the next page.
- Separating a table, chart, or figure—confine each to a single page.
- Submitting a manuscript with pages out of sequence.
- In every section of your document, use standard writing style, including articles ("a" and "the").
- Keep paying attention to the topic of the paper.
- Use paragraphs to split each significant point (excluding the abstract).
- Align the primary line of each section.
- Present your points in sound order.
- Use present tense to report well-accepted matters.
- Use past tense to describe specific results.
- Do not use familiar wording; don't address the reviewer directly. Don't use slang or superlatives.
- Avoid use of extra pictures—include only those figures essential to presenting results.

Title page:

Choose a revealing title. It should be short and include the name(s) and address(es) of all authors. It should not have acronyms or abbreviations or exceed two printed lines.

Abstract: This summary should be two hundred words or less. It should clearly and briefly explain the key findings reported in the manuscript and must have precise statistics. It should not have acronyms or abbreviations. It should be logical in itself. Do not cite references at this point.

An abstract is a brief, distinct paragraph summary of finished work or work in development. In a minute or less, a reviewer can be taught the foundation behind the study, common approaches to the problem, relevant results, and significant conclusions or new questions.

Write your summary when your paper is completed because how can you write the summary of anything which is not yet written? Wealth of terminology is very essential in abstract. Use comprehensive sentences, and do not sacrifice readability for brevity; you can maintain it succinctly by phrasing sentences so that they provide more than a lone rationale. The author can at this moment go straight to shortening the outcome. Sum up the study with the subsequent elements in any summary. Try to limit the initial two items to no more than one line each.

Reason for writing the article—theory, overall issue, purpose.

- Fundamental goal.
- To-the-point depiction of the research.
- Consequences, including definite statistics—if the consequences are quantitative in nature, account for this; results of any numerical analysis should be reported. Significant conclusions or questions that emerge from the research.

Approach:

- o Single section and succinct.
- o An outline of the job done is always written in past tense.
- o Concentrate on shortening results—limit background information to a verdict or two.
- o Exact spelling, clarity of sentences and phrases, and appropriate reporting of quantities (proper units, important statistics) are just as significant in an abstract as they are anywhere else.

Introduction:

The introduction should "introduce" the manuscript. The reviewer should be presented with sufficient background information to be capable of comprehending and calculating the purpose of your study without having to refer to other works. The basis for the study should be offered. Give the most important references, but avoid making a comprehensive appraisal of the topic. Describe the problem visibly. If the problem is not acknowledged in a logical, reasonable way, the reviewer will give no attention to your results. Speak in common terms about techniques used to explain the problem, if needed, but do not present any particulars about the protocols here.

The following approach can create a valuable beginning:

- Explain the value (significance) of the study.
- Defend the model—why did you employ this particular system or method? What is its compensation? Remark upon its appropriateness from an abstract point of view as well as pointing out sensible reasons for using it.
- Present a justification. State your particular theory(-ies) or aim(s), and describe the logic that led you to choose them.
- Briefly explain the study's tentative purpose and how it meets the declared objectives.

Approach:

Use past tense except for when referring to recognized facts. After all, the manuscript will be submitted after the entire job is done. Sort out your thoughts; manufacture one key point for every section. If you make the four points listed above, you will need at least four paragraphs. Present surrounding information only when it is necessary to support a situation. The reviewer does not desire to read everything you know about a topic. Shape the theory specifically—do not take a broad view.

As always, give awareness to spelling, simplicity, and correctness of sentences and phrases.

Procedures (methods and materials):

This part is supposed to be the easiest to carve if you have good skills. A soundly written procedures segment allows a capable scientist to replicate your results. Present precise information about your supplies. The suppliers and clarity of reagents can be helpful bits of information. Present methods in sequential order, but linked methodologies can be grouped as a segment. Be concise when relating the protocols. Attempt to give the least amount of information that would permit another capable scientist to replicate your outcome, but be cautious that vital information is integrated. The use of subheadings is suggested and ought to be synchronized with the results section.

When a technique is used that has been well-described in another section, mention the specific item describing the way, but draw the basic principle while stating the situation. The purpose is to show all particular resources and broad procedures so that another person may use some or all of the methods in one more study or referee the scientific value of your work. It is not to be a step-by-step report of the whole thing you did, nor is a methods section a set of orders.

Materials:

Materials may be reported in part of a section or else they may be recognized along with your measures.

Methods:

- Report the method and not the particulars of each process that engaged the same methodology.
- Describe the method entirely.
- To be succinct, present methods under headings dedicated to specific dealings or groups of measures.
- Simplify—detail how procedures were completed, not how they were performed on a particular day.
- If well-known procedures were used, account for the procedure by name, possibly with a reference, and that's all.

Approach:

It is embarrassing to use vigorous voice when documenting methods without using first person, which would focus the reviewer's interest on the researcher rather than the job. As a result, when writing up the methods, most authors use third person passive voice.

Use standard style in this and every other part of the paper—avoid familiar lists, and use full sentences.

What to keep away from:

- Resources and methods are not a set of information.
- Skip all descriptive information and surroundings—save it for the argument.
- Leave out information that is immaterial to a third party.

Results:

The principle of a results segment is to present and demonstrate your conclusion. Create this part as entirely objective details of the outcome, and save all understanding for the discussion.

The page length of this segment is set by the sum and types of data to be reported. Use statistics and tables, if suitable, to present consequences most efficiently.

You must clearly differentiate material which would usually be incorporated in a study editorial from any unprocessed data or additional appendix matter that would not be available. In fact, such matters should not be submitted at all except if requested by the instructor.

Content:

- Sum up your conclusions in text and demonstrate them, if suitable, with figures and tables.
- In the manuscript, explain each of your consequences, and point the reader to remarks that are most appropriate.
- Present a background, such as by describing the question that was addressed by creation of an exacting study.
- Explain results of control experiments and give remarks that are not accessible in a prescribed figure or table, if appropriate.
- Examine your data, then prepare the analyzed (transformed) data in the form of a figure (graph), table, or manuscript.

What to stay away from:

- Do not discuss or infer your outcome, report surrounding information, or try to explain anything.
- Do not include raw data or intermediate calculations in a research manuscript.
- Do not present similar data more than once.
- A manuscript should complement any figures or tables, not duplicate information.
- Never confuse figures with tables—there is a difference.

Approach:

As always, use past tense when you submit your results, and put the whole thing in a reasonable order.

Put figures and tables, appropriately numbered, in order at the end of the report.

If you desire, you may place your figures and tables properly within the text of your results section.

Figures and tables:

If you put figures and tables at the end of some details, make certain that they are visibly distinguished from any attached appendix materials, such as raw facts. Whatever the position, each table must be titled, numbered one after the other, and include a heading. All figures and tables must be divided from the text.

Discussion:

The discussion is expected to be the trickiest segment to write. A lot of papers submitted to the journal are discarded based on problems with the discussion. There is no rule for how long an argument should be.

Position your understanding of the outcome visibly to lead the reviewer through your conclusions, and then finish the paper with a summing up of the implications of the study. The purpose here is to offer an understanding of your results and support all of your conclusions, using facts from your research and generally accepted information, if suitable. The implication of results should be fully described.

Infer your data in the conversation in suitable depth. This means that when you clarify an observable fact, you must explain mechanisms that may account for the observation. If your results vary from your prospect, make clear why that may have happened. If your results agree, then explain the theory that the proof supported. It is never suitable to just state that the data approved the prospect, and let it drop at that. Make a decision as to whether each premise is supported or discarded or if you cannot make a conclusion with assurance. Do not just dismiss a study or part of a study as "uncertain."

Research papers are not acknowledged if the work is imperfect. Draw what conclusions you can based upon the results that you have, and take care of the study as a finished work.

- You may propose future guidelines, such as how an experiment might be personalized to accomplish a new idea.
- Give details of all of your remarks as much as possible, focusing on mechanisms.
- Make a decision as to whether the tentative design sufficiently addressed the theory and whether or not it was correctly restricted. Try to present substitute explanations if they are sensible alternatives.
- One piece of research will not counter an overall question, so maintain the large picture in mind. Where do you go next? The best studies unlock new avenues of study. What questions remain?
- Recommendations for detailed papers will offer supplementary suggestions.

Approach:

When you refer to information, differentiate data generated by your own studies from other available information. Present work done by specific persons (including you) in past tense.

Describe generally acknowledged facts and main beliefs in present tense.

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Discussion	Well organized, meaningful specification, sound conclusion, logical and concise explanation, highly structured paragraph reference cited	Wordy, unclear conclusion, spurious	Conclusion is not cited, unorganized, difficult to comprehend
References	Complete and correct format, well organized	Beside the point, Incomplete	Wrong format and structuring

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