# Meta-Analysis of Value Chain Financing Among Small Scale Rice Farming Enterprises in Enugu State, Nigeria

*Okpukpara B, *Onwuemelie Chioma Phyllis*Ude, Kingsley David and Okpukpara, V.

*Department of Agricultural Economics, University of Nigeria, Nsukka*
*Corresponding author: [1]Onwuemelie Chioma Phyllis (Email: Chiomaonwuemelie@gmail.com)*

## Abstract
*The aim of this study was to analyze value chain financing in small scale rice farming enterprises in Enugu State, Nigeria. This study examined characteristics of actors in the rice value chain in the study area; identified the value chain finance channels available to small scale rice farmers in the study area; examined types of financing and credit needs of the different value chain segments of small scale rice farming enterprise in the study area; assessed the factors influencing financing of different value chain segments of small scale rice farming enterprises in the study area;A total of hundred and forty (140) respondents were sampled for this study. Data collected for the study were analyzed using descriptive statistics. Interms of institutional characteristics, 30.7% of the respondents used communal land for rice production while 76.4% of them dealt on swamp rice, while cultivating majorly Faro 44 (Authority) (49.3%) and FADAMA 123 (Ekwueme) rice variety (42.1%). Rice farmers (48.6%) mostly sold directly to consumers and 45.7% sold directly to traders/processors. From the result, 34.3% of the respondents opted for availability of credit while 29.3% revealed unavailability of credit irrespective of the source whether formal or informal sources. In terms of credit accessibility, 27.9% of the respondents reported credit being accessible, while 8.6% revealed credit being inaccessible. Also, average proportion (52.1%) of the respondents are producers/farmers, implying that the producer segment of the rice value chain enterprises in the study area have more value chain actors than the others. Also, 22.1% of the producers opted for midterm financing as the financing type of high preference, 10.7% choose short term working capital, 15.7% preferred deposit accounts payments and a small proportion (3.5%) went for transfers as financing type subscribed to by producers.The researcher recommended that the type and quality of financial and credit products and services to rice value chain participants by government and financial institutions should be specific to their needs.*
*Keywords: Meta-Analysis, Value Chain Financing, Small Scale Rice Farming Enterprises, Enugu State*

## I. Introduction

Agriculture is the single largest contributor to the well-being of majority of the population, sustaining over eighty percent of rural households while also housing the potential to be the industrial and economic springboard for a nation's quest for accelerated growth and development. The sector is strategically positioned to have a high multiplier effect on the economy because of its linkages to the other real sectors of the economy (Agbaeze & Onwuka, 2013; Onyekwe, Osuofor & Ude, 2021). Agriculture is a major contributor of Nigeria's GDP and small-scale farmers play a dominant role in this contribution (Philip, Jayeoba, Ndripaya & Fatunbi, 2021). Consequently, there has been a dramatic increase in the incidence and severity of poverty in Nigeria, arising in part from the dwindling performance of agricultural sector where a preponderant majority of the poor are employed (Obed, Okpukpara & Ude, 2021; Ofana, Efefiom & Omini, 2016). The inability of this sector to expand and as well contribute meaningfully to the growth of Nigerian economy was due to inadequate financing.

Agriculture as a sector depends more on credit than any other sector of the economy as a result of the seasonal variations in the farmers returns and a changing trend from subsistence to commercial farming (Nzomo & Muturi, 2014). Agricultural sector incidentally lies in the hands of small scale farmers, whose expansion in terms of scale of production is low due to low inputs and low income. This has caused a decline in the area of agricultural productivity, which prevented many farmers from adopting improved practices which are of capital intensive option, since some of them lack the collateral to secure loan or credit from financial institutions (Asogwa, Abu & Ochoche, 2014). In order for smallholders to increase production with less additional land and without major increases in labour inputs, they will need to increase their own productivity through greater

capital and technology investments (Livingston, Schonberger & Delaney, 2011). Credit plays major roles in achieving productivity through capital and technology investment (Osuofor & Ude, 2021).

In the past few decades, the need for credit in farming sector rapidly increases because of rise in use of fertilizer, pesticides, high yield variety seeds and mechanization and rise in their prices (Rahman, Hussain & Taqi, 2014). Financial institutions have faced difficulties over the years in provision of finances for a multitude of reasons; the major cause of serious banking problems continues to be directly related to lax credit standards for borrowers and counterparties, poor portfolio risk management and lack of attention to changes in economic factors (Kwabena, 2014). In other words, flow of credit to the agricultural sector failed to exhibit any appreciable improvement due mainly to the fact that commercial banks were not tuned to the needs and requirement of small and marginal farmers, while the co-operatives, on the other hand, lacked resources to meet the expected demand (Bala, 2015). Thereby providing finances and services not designed for the desired purpose of use. For this reason, financing agriculture continues to be perceived as having high costs of operation, high risks and low returns on investment. Despite good intentions for directing credit to agriculture, the results of the agricultural lending programmes in developing countries commonly have unsatisfactory results with low rates of repayment inspite of (or often partly because of) high subsidies. While agricultural development banks have been slow to innovate, often due in part to government directives given to them, commercial banks have traditionally shied away from this sector because of uncontrollable and systemic risks, higher costs and fear of the unknown for bankers not familiar with the sector and setting (Ilu, 2015). Microfinance institutions reach some of these low-income households but at a high cost, with short-term loan products that are generally not able to address the full range of their agricultural needs (Ike, Aberji & Aliu, 2016). Also, a variety of informal financial institutions have tried to fill the gap. These include rotating savings and credit associations, local credit unions, financial Non-Governmental Organizations, businesses financing their agricultural customers, local private moneylenders, friends and relatives, self-help groups, and many others. Nevertheless, a large number of smallholders in many low-income countries are underprovided in financial services, and face high costs for these financial services available (Sarris, 2016). The value-chain approach becomes, in a certain manner, a strategic response to these innovation imperatives for extending credit to farmers for agricultural activities (Essien, Arene, & Nweze, 2013).

Recent innovations in agricultural finance have created renewed interest in the sector. Such innovations include value chain finance approaches involving traders and processors, warehouse receipt finance, agricultural index insurance, to name a few (ADB, 2012). Salisu (2016) opined that farmers included in value chains find it easier to access credit and do so in larger numbers than farmers who lack the backing of value chain partners. The last mile of addressing smallholder finance demand is reaching smallholders in value chains (Rapu, 2016). Value chains are organized linkages between groups of producers, traders, processors, and service providers that join together to improve productivity and the value added from their activities (Support for Agricultural Value Chain Development Evaluation Independent October, 2012). Value chain finance is any or all of the financial services, products and support services flowing to and/or through a value chain. This can be internal financing directly from one value chain actor to another or external from a financial institution or investor based upon the borrower's value chain relations and activities. Value chain finance is aimed at addressing the needs and constraints of those involved in the chain. This is often a need for finance but it is also commonly used as a way to secure sales, procure products, reduce risk and/or improve efficiency within the chain (Miller & Jones, 2010). Finance that is linked with value chains is not new and some types of trader finance, for example, have been around for millennia; what is new is the way it is being applied more systematically to agriculture, using innovative or adapted approaches, tools and technologies (World Bank, 2008).

Among the value chains with high development potentials in Nigeria, that require more substantial amounts of funding is rice, cassava, poultry and soy bean. In response to the growing local demand for rice, several private rice companies have planned future investments in rice processing. These companies intend to increase milling capacity significantly. However, the problem of organizing supplies and ensuring quality of paddy obtained from the smallholder farmers remain a challenge (UNIDO, 2010). The main actors in the rice value chain in Nigeria are rice farmers, paddy traders, millers, rice traders and retailers. They engage in the following, value adding activities such as: production, harvesting, storage and paddy aggregation at traders' level, parboiling, milling, wholesaling, and retailing. Smallholder rice farmers ranks the first –as the majority of producers in the country, characterized by low input use and low-yield- average of 20 hectares production (less than 2 Tonne/ha) strategy (USAID, 2010). According to Obansa and Maduekwe (2013), finance is the sole of paddy rice cultivation business and it represents a long-term financing that could induce growth in rice output and paddy rice farm productive efficiency. Farm loans obtained by paddy rice farm households were used to purchase farm inputs and as such generated debt and interest expense (Rapu, 2016).

The current government seems to have adopted similar goals as its predecessors with regards to obtaining self-sufficiency in rice production by 2017, through the provision of single digit interest rates available for agricultural loans on paddy production; however, farmers report challenges with accessing such

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loans (McCarthy, Singh & Schiff, 2018). Processors report that local rice production costs are considered relatively expensive, largely due to rising costs for low-yielding seeds/seedlings and transportation to/from milling facilities which are located in areas of inadequate infrastructures, such as roads and electricity (Shehu, Mshelia, & Tashikalma, 2007). Understanding value chain finance improves the overall effectiveness of those providing and requiring agricultural financing. It improves the quality and efficiency of financing agricultural chains by identifying financing needs for strengthening the chain, tailoring financial products to fit the needs of the participants in the chain, reducing financial transaction costs through direct discount repayments and delivery of financial services and using value chain linkages and knowledge of the chain to mitigate risks of the chain and its partners (Ijioma & Osondu, 2015). Despite the handful of studies already done on value chain financing, little or none was on analysis of value chain financing in small scale rice farming enterprises in Enugu state Nigeria.

This study therefore investigates the value chain financing among small scale rice farming enterprises in Enugu state, Nigeria through description of institutional characteristics of respondents, ascertained the rice value chain actors by credit availability, accessibility conditions and demand frequency as well as identified rice value Chain finance participants and typical demand for financial services.

## II.     Methodology

The study area is Enugu State, of Nigeria. The target population of the study was the small holder rice farmers. The study employed a simple random sampling technique. A list of producers, processors and marketers was obtained from FADAMA which presented a clear picture of the population and using the Cochran sample size formula at a statistically acceptable 10% margin of error and 90% confidence level in line with resource considerations; 68 farmers of the 22,000 farmers were randomly selected, 31 processors of the 7000 processors were randomly selected and 41 marketers of the 16,000 marketers were randomly selected through the lottery draw approach method giving a total of 140 respondents which formed the sample size of the study (table 1).Data collected for the study were analyzed using descriptive statistics.

**Table 1: Online Sample size calculator adopting Cochran formulae (Source: Survey monkey, 1961)**

| Value chain actors | Population Size selected areas (Source: FADAMA) | Sample size of Producers (@ 10% margin of error) |
|---|---|---|
| Producers | 22,000 | 68 |
| Processors | 7,000 | 31 |
| Marketers | 16,000 | 41 |
| **Total** | **45,000** | **140** |

Data for this study were collected from primary sources. The data were collected by the researcher and well-trained research assistants using a well-structured questionnaire and interview schedule. To determine the adequacy and relevant of the instrument of the research instrument, content validity was used. The reliability of the instrument to check the consistency and the reaction of the respondents to the questions employed the test-retest method. Descriptive statistics were used for the data analysis

## III.     Results And Discussion
**Institutional characteristics of respondents**

Institutional characteristics of the small scale rice value chain enterprises described the system of operation in the small scale rice value chain enterprises. Table 1:shows the **d**istribution of Rice value chain actors by the institutional characteristics considered in the study.

**Table 1: Distribution of respondents by institutional characteristics.**

| Institutional characteristics | Frequency | Percentage | Mean |
|---|---|---|---|
| **Land ownership** | | | |
| Inherited | 36 | 25.7 | |
| Communal | 43 | 30.7 | |
| Purchased | 33 | 23.6 | |
| Rented | 23 | 16.4 | |
| Gift | 5 | 3.6 | |
| | | | |
| **Category of rice cultivated** | | | |
| Swamp Rice | 107 | 76.4 | |
| Upland Rice | 33 | 23.6 | |
| | | | |
| **Major Variety of Rice cultivated** | | | |
| FARO      44 (*Authority*) | 69 | 49.3 | |
| FADAMA 123 (*Ekwueme*) | 59 | 42.1 | |
| FADAMA 56 | 44 | 31.4 | |

| | | | |
|---|---|---|---|
| **Number of employees** | | | |
| Less than 3 | 3 | 2.1 | |
| 4 - 6 | 123 | 87.9 | |
| 7 and above | 14 | 10.0 | 5.51 |
| | | | |
| **Rice sale target medium** | | | |
| Through agents | 8 | 5.7 | |
| Directly to traders/processors | 64 | 45.7 | |
| Directly to consumers | 68 | 48.6 | |
| | | | |
| **Profit perception** | | | |
| Unstable | 30 | 21.5 | |
| Neutral | 46 | 32.9 | |
| Stable | 64 | 45.7 | |

Descriptive statistical analysis on Table 1 shows that 30.7% of the respondents used communal land for their rice production while 25.7% of the respondents inherited their farmland. Communally owned land could help farmers without land have access to land for production. The result differs from the findings of Rapu (2016), where majority of paddy rice farms were situated on owned land that is by means of traditional inheritance. The status is as a result of land tenure system and practices. From the table also**,** category of rice cultivated had two options; swamp and upland rice. Majority (76.4%) of the respondents deal on swamp rice while (23.6%) deal on upland rice. Majority (49.3%) of the respondents cultivated FARO 44(Authority). According to Phillip, Jayeoba, Ndirpaya & Oluwole, (2021), out of many newly improved rice varieties being developed and used by farmers in Nigeria, FARO 44, is one of the most distributed rice varieties in the Nigerian rice sector. It is an improved local semi-dwarf cultivar of rice grown in Nigeria. This perhaps disagrees to the suggestion of Nduaguba (2016), who stated thus with exception to the integrated operations, the dominant small holder farmers are mostly planting traditional low-yielding and the adulterated rice seeds. Table 1 also showed majority of small scale rice enterprises famers (87.9%) had between 4 and 6 employees at a mean of 6 persons. The result implies that small scale rice farming enterprises in the study area have limited number of employees thus; obviously small scaled.

Rice sales target medium results reported 48.6% of the respondents which forms the majority sell directly to consumers. In another study with an opposing view, the top four channels of marketing rice among farmers includes majorly on-farm to wholesalers, sales at the local/village market, sales to agro-processors, sales at urban markets within the state , while a negligible (12%) sell directly to consumers (Phillip, Jayeoba, Ndirpaya & Oluwole, 2021). However in Nigeria, millers prefer to sell to government and humanitarian buyers due to consistent purchases at favorable prices (Musuva, 2015). In terms of profit perception of rice enterprises by the respondents, majority (45.7%) of the respondents agreed to profit stability of rice business, 32.9% of the respondents were neutral while 21.5% opted for profit instability of rice business. The result shows that rice production was a profitable venture in the study area. The result is in conformity with the works of Ogundari (2008) and Tashikalma et al. (2014), who reported that rice production is a profitable venture among small scale producers in Nigeria. In the same tone, among rice farmers in Kano River Irrigation Project, Ilu (2015) posited despite the low productivity of rice, rice production was found to be a profitable venture in the area. Also, while Ray et al.(2006) recounted that paddy rice marketing was profitable in Benue State, Nigeria Paul (2013) reported that paddy rice assembling and rice processing was profitable in Abia State Nigeria. This concurs with FAO, (2013) and Iheanacho and Mshehia (2004) who stated that rice processing was a profitable venture in the North-Central Zone of Nigeria. Furthermore, Salisu (2016) confirmed in his study that rice retail business was profitable in Nasarawa State, Nigeria.

**Credit Availability, accessibility, conditions and demand frequency**

Table 2 below shows the distribution of rice value chain actors by credit availability, accessibility conditions and demand frequency.Credit availability is the presence of credit in the formal and informal sources while credit accessibility refers to the ease or difficulty of acquiring credit by borrowers for purposes such as to enhance business performance (Salahuddin, 2006). In terms of credit conditions, they are the minimum conditions set by lending institutions to which borrowers must adhere in order to qualify for loan (Bohnstedt, 2000). The table also included the frequency of demand of credit in years and the conditions involved in credit access demand and acquisition.

**Table 2: Distribution of Rice value chain actors by credit availability, accessibility conditions and demand frequency**

| Credit availability Accessibility etc | Frequency | Percentage (%) | Mean |
|---|---|---|---|
| **Credit availability** | | | |
| Available | 48 | 34.3 | |
| Unavailable | 41 | 29.3 | |
| | | | |
| **Credit accessibility** | | | |
| Accessible | 39 | 27.9 | |
| Inaccessible | 12 | 8.6 | |
| | | | |
| **Credit demand frequency** | | | |
| Less than 5 years | 118 | 84.2 | |
| 5 – 10 years | 22 | 15.7 | 3.34 |
| | | | |
| **Credit conditions** | | | |
| Repayment after harvest | 50 | 35.7 | |
| Collateral needs | 65 | 46.4 | |
| Repayment after one year | 25 | 17.9 | |
| With 8% interest rate | | | |

*Source, computed from field survey, 2021*

Descriptive statistical analysis in Table 2 showed that credit availability is attested to a reasonable extent by rice value chain actors in the study area, as 34.3% of the respondents opted for availability of credit while a (29.3%) opted for unavailability of credit irrespective of the source whether formal or informal sources. In terms of credit accessibility, 27.9% of the respondents opted for credit being accessible, while 8.6% opted for credit being inaccessible. In appraising financial constraints to small scale farmers in Etsako Local Government Area of Edo State, Awotodunbo, (2008), revealed that only 7% of small scale farmers have access to basic loan while 93.0% accessed loan from other sources like co-operative societies, personal savings and relations. This agrees with the finding of this study. Ali, Agbo, Ukwuaba and Chiemela, (2017) revealed low income of farmers' implied limited access to credit facilities. However, access to credit on itself is not an assurance to credit use but a guarantee of possibility, suggesting rice value chain actors in the study area have limited access for such possibility. In terms of credit demand frequency, 84.2% of the respondents which forms the majority demanded credit for less than 5 years and a little proportion of 15.7% demanded credit between 5-10 years. Acquisition of such credit is difficult for the SMEs because of high rates of interest on lending, and this has constrained private sector demand for credit and limited their progress (Kariuki, 2016).With regards to credit conditions, majority (46.4%) of the respondents claimed collateral needs as most important credit condition followed by repayment after harvest which 35.7% opted for and repayment after one year for 17.9% of the respondents. Da Silva (2007), recorded over 54.0% of farmers cited from a combination of high interest rates and lack of collateral, lack of loan security and information about credit products as inhibiting credit conditions.Perhaps, favorable credit terms encourage borrowing while unfavorable credit terms limit borrowing. Therefore, the relationship is linear and significant which is in conformity with the findings of Kasekende and Opondo (2004) and Ezedinma (2008), each of whom pointed out that these terms and conditions set by financial institutions for loan applicants discourages borrowing when unfavorable.

**Riceenterprise value chain actors and typical demand for financial services**

**Table 3: Rice enterprise value chain actors and typical demand for financial services**

| VCF participants | Frequency | Percentages (%) |
|---|---|---|
| **Producers** | 73 | 52.1 |
| Short-term working capital | 15 | 10.7 |
| Mid-term financing (equipment, livestock) | 31 | 22.1 |
| Deposit accounts (value storage, commitment savings) | 22 | 15.7 |
| Payments, transfers | 5 | 3.5 |
| **Processors** | 41 | 29.3 |
| Short-term working capital | 9 | 6.4 |
| Mid-term financing (equipment) | 15 | 16.7 |
| Deposit accounts (checking) | 11 | 7.9 |
| Payments, transfers | 6 | 4.2 |
| **Marketers** | 20 | 14.3 |
| Short-term working capital | 13 | 9.3 |
| Mid-term financing (equipment) | 11 | 7.8 |
| Deposit accounts (checking) | 3 | 2.1 |
| Payments, transfers | 1 | 0.7 |

*Source, computed from field survey, 2021*

. Descriptive statistical analysis in Table 3 recorded respondents and their typical demand for financial services. Majority (52.1%) of the respondents are producers/farmers, implying that the producer segment of the rice value chain enterprises in the study area, have more value chain actors than the others. Majority (22.1%) of the producers opted for midterm financing as the financing type of high preference, (10.7%) choose for short term working capital , (15.7%) opted for deposit accounts payments and a minute (3.5%) went for transfers as financing type subscribed to by producers.Producer segment is driven by small scale or large scale famers with the rationale to make new market, high market price and stabilize market position (Miller & Jones, 2010).

In agricultural production, due to the cropping cycle, working capital requirements are of a different nature. Depending on the product, working capital requires a sequence of financial commitments which depending on the producer's disposition over resources, need to be met by a mix of short, medium and long term credits, which may be met by different finance providers (UNIDO, 2010). This is because at different stages of production, the need for finance is stipulated by the production activities ongoing, which is also the case with rice value chain producer/farmers segment in the study area**.** For processors, 29.3% of the respondents belong to this segment. Among the processors, majority (16.7%) opted for midterm financing as financing type of high preference, 6.4% of the respondents went for short term working capital, while 7.9% preferred deposit accounts, the remaining (4.2%) of the respondents choose payments/transfers.

A small proportion (14.3%) of the respondents were marketers, 9.3% of the marketers opted for short term working capital as financing preference within the segment, 7.8% chose midterm financing, 2.1% deposit accounts, 0.7% for payments and transfers. UNIDO (2010), stated thus, the need for finance among value chain actors includes for the following; the input industry needs working capital like overdraft and asset-based finance for disposing credit to customers down line the chain, while producers need credit for input procurement, operating expenses and equipment. In the case of processors, they need credit as working capital for equipment while marketers need credit as working capital including fixed asset for wholesale warehouses, transport and vehicles.

## IV. Recommendations
Based on the findings of this study, the following recommendations were made:
1. Government and appropriate agencies should invest in subsidization of fertilizers and other agro-chemicals to make them affordable by rural rice farmers. In addition, there should be provision of credit input materials to rice farmers to help encourage undercapitalized farmers to adopt improved practices in rice production.
2. There is also need to scale up access to insurance to help smallholder farmers to manage risk and foster the growth in farm productivity. The study shows that despite the various operational risks facing farmers, there is a serious lack of tailored formal and informal insurance mechanisms.
3. There is need to review and strengthen monitoring and control mechanisms based on an accurate and objective assessment of the credit worthiness of the clients towards reducing the level of non-performing

loans. Financial institutions should be able to give, manage and service loans cost-efficiently in a bid to improve loan processing and monitoring.

4. Therefore, the success of rice value chain in the study area lies both in meeting up with the financial demands of chain actors as well as providing enabling environment for effective use of these finances to be able to impact growth in the sector.

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