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THE IMPACT OF PEOPLE'S BUSINESS CREDIT (KUR) ON ECONOMIC GROWTH IN THE AGRICULTURAL SECTOR OF WEST NUSA TENGGARA

Daryoto Muslih Utomo[1]*, Syafaat Ali Akbar[2]
[1]Directorate General of Treasury, Ministry of Finance, Jakarta
[2]Directorate General of Taxes, Ministry of Finance, Jakarta
Email: [1]daryotomuslih@kemenkeu.go.id, [2]syafaat@kemenkeu.go.id
*Corresponding author

ABSTRACT
Research Originality — The existing literature offers limited empirical evidence on the role of targeted government credit programs in the agricultural sector as a strategy for mitigating the impacts of climate change. This study addresses this gap by examining the specific impact of the Kredit Usaha Rakyat (KUR) program on agricultural economic growth in a climate-vulnerable region.
Research Objectives — The research aims to assess the effect of KUR on economic growth in the agricultural sector of West Nusa Tenggara, Indonesia.
Research Methods - An explanatory research design was employed, using data on KUR distribution, rice production, and Gross Regional Domestic Product from 2019 to 2023. The data were analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM) with SmartPLS 4.0, a method well-suited for complex predictive models.
Empirical Result — The findings reveal that KUR has a positive and significant impact on rice production, and rice production, in turn, is a vital driver of the region's economic growth. However, the distribution of KUR does not directly contribute to economic growth without the intermediary effect of increased rice production.
Implications — This study provides policymakers with evidence that targeted credit programs can be an effective tool for stimulating agricultural output and regional economic growth, underscoring the need for coordinated efforts among government bodies and credit distributors.

Keyword: Agriculture, climate change, credit program, economic growth, government, Indonesia.
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INTRODUCTION

Climate Change in Indonesia

The issue of global warming has emerged as a significant concern for nations worldwide (Surmaini et al., 2011). Recent findings from the Intergovernmental Panel on Climate Change (IPCC) reveal that the Earth's surface temperature has increased by 1.09°C compared to the period of 1850–1900, with land temperatures rising by 1.59°C and ocean surface temperatures increasing by 0.88°C (IPCC, 2023). With global temperatures increasing annually by nearly 2°C and considering various greenhouse gas emission scenarios, it is anticipated that Indonesia will face a continued rise in temperatures in the coming years (BRIN, 2024). One significant consequence of this temperature rise is the intensification of climate change (UN, 2024).

Climate change refers to enduring changes in temperature and weather patterns (UN, 2024). In many regions, climate change has led to a surge in the frequency and intensity of such disasters (Sivakumar, 2005) as floods and storms by 70% while the remaining 30% consists of droughts, landslides, forest fires, heat waves, and other occurrences (Surmaini *et al.,* 2011). IPCC reports also demonstrate that human activities have played a role in global warming since the mid-20th century (IPCC, 2023). Unmitigated global warming is projected to result in droughts and extreme rainfall, which will subsequently lead to more severe climate disasters (Surmaini *et al.,* 2011).

APPLICATIONS FOR PRACTICE

- Climate change poses a significant threat to Indonesia's vital rice sector, particularly in key regions like West Nusa Tenggara (NTB), impacting both production and farmer livelihoods.
- Access to credit (KUR) is a crucial tool for helping farmers cope. Our findings show that providing credit boosts rice production and strengthens the agricultural economy.
- The government must make it easier for farmers to secure this credit, especially through micro-lending schemes. This access should be coupled with support to ensure the funds are used for new technologies that increase resilience and production.

According to the analysis conducted by the United Nations Office for the Coordination of Humanitarian Affairs (UNOCHA) in 2006, Indonesia is classified as one of the countries vulnerable to disasters due to climate change (UNDP, 2007). The 'El Niño-Southern Oscillation' is identified as a primary factor contributing to climate change in Indonesia, leading to various extreme weather events occurring periodically. El Nino, characterized by warm ocean currents in the Pacific Ocean, and La Niña, characterized by cold ocean currents, collectively known as the El Niño-Southern Oscillation (ENSO), play a significant role in shaping the climate in Indonesia. El Niño causes droughts while La Niña brings heavy rainfall, both of which result in floods, droughts, storms, landslides, and forest fires in Indonesia (UNDP, 2007).

The findings of the research conducted by the National Research and Innovation Agency (BRIN) indicate that the effects of climate change in 2024 will lead to a shift in the timing and duration of the rainy season in Indonesia, resulting in reduced rainfall and a prolonged dry season (BRIN, 2024). It is predicted that there will be an increase in the rainfall in Sumatra, Papua, and Western Indonesia, whereas the Eastern Indonesia, including Bali and Nusa Tenggara, is expected to experience a decrease in rainfall of up to 20 percent (BRIN, 2024).

Concerns have been raised about the potential decline in the rainfall in the Bali and Nusa Tenggara regions and its implications for the sustainability of agricultural production, particularly in the West Nusa Tenggara (NTB) region, which serves as Indonesia's primary rice granary. Salinger (2005) highlights three main factors that have a significant impact on the rice farming sector: shifts in rainfall patterns, an increase in extreme climate events (such as floods and droughts), rising air temperatures and sea levels. The Meteorology, Climatology, and Geophysics Agency (BMKG) of NTB Province has indicated that climate change in the region could lead to prolonged droughts by 2024, posing a high risk of crop failure in the rice farming industry (BMKG, 2024). According to a study by BRIN, a temperature increase of 1 - 2.5°C and a decrease in rainfall of 5% - 25% can result in a 50% reduction in rice production (BRIN, 2024).

Apart from the threat of crop failure, climate change also exerts a significant influence on the economy of NTB. Data from the Statistics Indonesia (BPS) (2024a) reveals that the agricultural sector accounts for 33.54% of the main employment structure in NTB Province. The decline in production or crop failure in this sector can lead to a decrease in the welfare of the individuals employed in agriculture, who form most of the workforce in NTB. This underscores the necessity of giving special attention to the agricultural sector in NTB. According to the World Bank (2018), the agricultural sector has the potential to drive socioeconomic development and bring benefits to the rural poor. Therefore, it is essential to enhance the resilience of farmers in responding to the various challenges faced by the communities vulnerable to climate change. Etwire (2020) emphasizes the indispensable nature of building farmers' resilience to climate change in this specific context.

The NTB Provincial Environment Office has reported that significant actions have been taken by the central government and local administrations to deal with the consequences of climate change in NTB Province. These actions involve reducing greenhouse gas (GHG) emissions, enhancing agricultural practices and technology, and implementing adaptation strategies by adjusting agricultural practices and technology. A study by Surmaini *et al.* (2011) suggest that mitigation of GHG emissions from agricultural land can be achieved through the use of low-emission crop varieties and advanced water and land management technologies.

As the Regional Chief Economist (RCE), the Ministry of Finance through the Regional Office of the Directorate General of Treasury (Kanwil DJPb) of NTB Province has implemented a range of strategic policies to address the potential economic growth reduction caused by climate change in NTB Province. In the presentation by the West Nusa Tenggara Regional Asset and Liabilities Committee (ALCo) in April 2024, Kanwil DJPb and the Regional Disaster Management Agency (BPBD) of NTB Province stated that they focus on mitigation efforts, encouraging farmers to conserve irrigation water, particularly during the second rice planting season. Furthermore, Kanwil DJPb of NTB Province has proposed various strategic response policies, including enhancing access to people's business credit (KUR) to help micro, small, and medium

enterprises (MSMEs) in the agricultural sector mitigate and adapt to the impact of climate change (Kanwil DJPb Provinsi NTB, 2024).

In 2024, the government allocated a national budget (APBN) of IDR 288.16 trillion for KUR interest and margin subsidies. By June 2024, the actual distribution of KUR in NTB reached IDR 2.69 trillion, benefiting 61,058 recipients. Of this total, IDR 50.03 billion (1.86%) was specifically allocated to 1,416 recipients in the rice farming sector (Direktorat Jenderal Perbendaharaan, 2024).

Several studies have indicated the positive impact of credit access on the economic growth of the agricultural sector. Ojo *et al. (*2021) conducted a study on 183 farmers in South Africa and found a significant and positive relationship between credit access and farmers' ability to adapt to climate change. The researchers also noted that the availability of financial support strongly influenced farmers' decisions to adopt adaptation strategies. Similarly, Sani *et al. (*2016), Marie *et al. (*2020), and Ojo and Baiyegunhi (2020) reported that credit access enabled farmers to cope with transaction costs associated with various adaptation options.

Furthermore, Batung *et al. (*2023) found that farmers with access to financial credit in the Northwest Region of Ghana exhibited significantly better resilience to climate change compared to those without credit access. The research conducted by Reyes *et al. (*2012) in Chile indicated that access to financial credit significantly influenced rural development and agricultural productivity among smallholders. Similarly, Yu (2008) in China pointed out that credit was essential for farmers to ensure food security and generate profits through sales. Dong *et al. (*2010) also observed in China that farmers with financial credit exhibited higher agricultural productivity and resilience compared to those without credit. Furthermore, Duy (2012) demonstrated in Vietnam that access to credit enhanced farmers' resilience by increasing their yields. In addition, Miller and Ladman (1983) highlighted a positive association between access to financial credit and the general welfare of smallholders in Bolivia.

According to the priority theory of sustainable finance, the degree to which economic actors attempt to reach sustainable finance targets in a country or region reflects the significance attributed to the sustainable finance agenda in that specific area (Wilson, 2010). This theory corresponds to the endeavors made by the government in prioritizing MSMEs credit access in the agricultural sector through KUR. By enhancing rice farmers' access to KUR, it is expected that farmers will improve their financial capability and resilience in the face of climate change.

Despite the acknowledged positive association between credit accessibility and farmer resilience, Batung *et al. (*2023) argue that there is still a necessity for further investigation into the impact of credit distribution on economic growth in the agricultural sector, particularly in such countries vulnerable to climate change as Indonesia. Furthermore, given the Indonesian government's response policy of increasing access to KUR for farmers to address the effects of climate change, it is crucial to conduct additional research on the effect of KUR on economic growth in the agricultural sector. This study examined the data on the distribution of KUR, rice production, and gross regional domestic product of NTB Province from 2019 to 2023 to assess the effect of KUR distribution on the economic growth in the agricultural sector, utilizing partial least squares structural equation modeling (PLS-SEM) on SmartPLS 4.0.

This research is structured into five parts. The next section provides an overview of the literature review and the development of hypotheses, followed by research methodology, profile, and data analysis. The findings of the analysis are then presented, followed by a discussion of the limitations of the study. In the final section, we summarize this research and propose some policy recommendations.

LITERATURE REVIEW

The Priority Theory of Sustainable Finance

Various definitions of sustainable finance have been proposed in previous studies. Ryszawska (2016) defines sustainable finance as finance that supports sustainable development in three dimensions: economic, environmental, and social. Migliorelli (2021) defines sustainable finance as finance that supports sectors or activities contributing to at least one relevant sustainability dimension. Meanwhile, Gerster (2011) defines sustainable finance as finance that considers environmental, social, and governance (ESG) factors, and Ozili (2021) defines sustainable finance as finance that considers ESG when making investment decisions in the financial sector. In addition, Bakken (2021) defines sustainable finance as investment decisions that consider the ESG factors of an economic activity or project. These definitions can be categorized into two groups, with the first group emphasizing the consideration of economic, social, and governance factors and the second group focusing on meeting the long-term needs of the economy (Ozili, 2023).

Multiple studies in the sustainable finance literature highlight the necessity for financial institutions to concentrate on sustainable finance. Oman and Svartzman (2021) assert that the financial sector needs to assume a more substantial role in the transition to a sustainable economy, and policymakers in different parts of the world have initiated sustainable finance programs to combat climate change in line with the

Paris agreement. Additionally, Schumacher, Chenet, and Volz (2020) investigate the role of sustainable finance and investment in Japan as well as how Japan's financial sector can mitigate increasing climate risks and support the country's transition to a zero-carbon sustainable economy.

The priority theory of sustainable finance emphasizes the role of governments in advancing towards a sustainable economy. This theory suggests that the extent to which economic actors, such as governments, actively work towards achieving sustainable finance objectives within a country or region reflects the level of importance assigned to the sustainable finance agenda in that location (Wilson, 2010). Therefore, the priority theory of sustainable finance posits that if a government views the consequences of climate change as a critical issue that demands attention, then it is crucial for the government to prioritize providing credit to farmers. By doing so, farmers in Indonesia can access the financial resources and resilience necessary to effectively address the impact of climate change.

People's Business Credit

The Regulation of the Minister of Economic Affairs Number 7 of 2024 outlines that people's business credit or *kredit usaha rakyat* (KUR) is a form of credit/financing for working capital and/or investment provided to individual borrowers, business entities, and/or business groups that are productive and eligible but lack additional collateral or have insufficient additional collateral (Indonesia, 2024). Therefore, KUR is envisioned to support small farmers who lack adequate collateral in obtaining bank credit. Furthermore, KUR is designed with three primary objectives: to enhance and broaden access to financing for productive enterprises, to boost the competitiveness of micro, small, and medium-sized businesses, and to stimulate economic growth and employment (Indonesia, 2024).

The Regulation of the Minister of Economic Affairs Number 7 of 2024 specifies the existence of five KUR schemes, including super-micro KUR, micro KUR, small KUR, KUR for the placement of Indonesian Migrant Workers (PMI), and special KUR. Super-micro KUR allocates a maximum amount of IDR10,000,000 to each recipient, while micro KUR provides an amount exceeding IDR10,000,000 up to IDR100,000,000 per recipient. Small KUR grants an amount above IDR100,000,000 up to IDR500,000,000 per individual. KUR for the placement of Indonesian Migrant Workers is capped at IDR100,000,000 while special KUR is disbursed based on the specific needs of individual group members, with a maximum amount of up to IDR500,000,000.00.

The distribution of KUR is mainly directed towards the production sector, encompassing industries that contribute to the expansion of goods and/or services in agriculture, hunting, forestry, marine and fisheries, processing industry, construction, salt mining, tourism, production services, and/or other related sectors. The emphasis on KUR allocation in the food crop agriculture sector is evident in the Regulation of the Minister of Economic Affairs Number 7 of 2024, which specifies that there is no restriction on the amount of Micro KUR distribution for this sector (Indonesia, 2024).

The Effect of Credit on Rice Production and Economic Growth in The Agricultural Sector

The significance of credit in farmers' production cannot be overstated. Access to working capital or investment credit from financial institutions can significantly expedite the adoption of modern agricultural technologies and production patterns, enhance farmers' risk-bearing capacity, and bolster their economic resilience in the face of disasters (Xi and Li, 2007). As a result, agricultural credit is crucial for income growth and poverty alleviation, garnering attention from numerous governments and economists.

The impact of agricultural credit on agricultural productivity has been extensively explored by various researchers across different regions worldwide (e.g. Chaudhry, 2022; Carter, 1989; Feder *et al.,* 1990; Shrestha, 1992; Zeller *et al.,* 1998; Iqbal *et al.,* 2022; Siddiqi and Baluch, 2009; Khan *et al.,* 2007; Sial and Carter*,* 2016; Chandio *et al.*, 2016; Chandio, Yuansheng, Sahito and Larik, 2016). Their collective findings consistently point towards a positive and significant correlation between agricultural credit and productivity. Furthermore, recent research conducted by Chandio *et al. (*2018) reinforces this relationship by highlighting the positive impact of credit on rice production, underscoring the pivotal role of agricultural credit in enhancing the socio-economic status of farmers.

In the context of developing countries, credit plays a crucial role in enhancing agricultural production (Okurut *et al.,* 2005). Nasir (2007) investigates the significance of agricultural sector credit in agricultural development. Agricultural credit enables farmers to make new investments and adopt innovative agricultural technologies to boost agricultural productivity. Considering the impact of climate change, farmers can use credit to finance the adoption of adaptation and mitigation technologies to enhance their agricultural productivity. Meanwhile, a lack of access to formal credit has negative consequences on agricultural production and the welfare of farmers (Chandio *et al.,* 2018). Therefore, the hypothesis proposed in this study is as follows.

H1: KUR distribution has a positive effect on rice production
H2: KUR distribution has a positive effect on economic growth

The Effect of Rice Production on Economic Growth in The Agricultural Sector

Various studies conducted in the past have established a positive association between agricultural yield and the economic progress of a specific region (Matsuyama, 1992). The Food and Agriculture Organization (2019) affirms that an increase in rice production can significantly bolster the overall output in the agricultural domain of a country. This surge in rice production can consequently amplify the agricultural sector's contribution to the gross regional domestic product (GRDP). Furthermore, the enhanced rice production can result in augmented income for farmers through the sales of surplus produce, thereby fueling local consumption and fostering economic growth in rural areas.

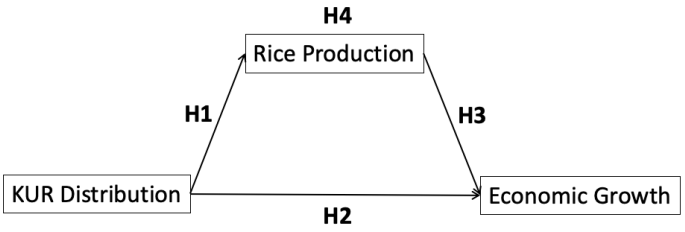
According to Matsuyama (1992), the presence of credit in the agricultural sector has a positive and significant influence on rice production, a conclusion that is supported by the research of Chandio *et al. (*2018). Xi and Li (2007) also highlight the significance of agricultural credit in driving income growth and poverty alleviation. Therefore, it can be inferred that obtaining credit for rice farming can lead to increased productivity and resilience to the impact of climate change. This, in turn, can contribute to higher income for farmers, poverty reduction, and overall economic growth in the agricultural sector. Consequently, the next hypothesis in this study is proposed.

H3: Rice production has a positive effect on economic growth

H4: Rice production mediates the relationship between KUR distribution and economic growth

Figure 1 explains the research model consisting of the first hypothesis to the fourth hypothesis.

Figure 1 Research Model



Source: Processed by the authors

METHODS

An explanatory research design was adopted in this study, employing a hypothesis-deductive approach. The secondary data source included data on the distribution of KUR in the rice farming sector, rice production statistics, and the gross regional domestic product (GRDP) in the agricultural sector for the period of 2019-2023 in Lombok Barat District, Lombok Tengah District, Lombok Timur District, Sumbawa District, Dompu District, Bima District, Sumbawa Barat District, Lombok Utara District, the City of Mataram, and the City of Bima in West Nusa Tenggara Province, Indonesia. The data analysis was carried out using the partial least squares structural equation modeling (PLS-SEM) with the assistance of SmartPLS 4.0.

Profile of West Nusa Tenggara Province

The geographical location of West Nusa Tenggara Province falls between 115° 46' - 119° 5' east longitude and 8°10' - 9°5' south latitude. It is bordered by the Java Sea and Flores Sea in the north, the Indian Ocean in the south, the Lombok Strait and Bali Province in the west, and the Sape Strait and East Nusa Tenggara Province in the east (Pemerintah Provinsi NTB, 2024).

The geographical features of NTB exhibit significant diversity. Lombok Island is characterized by hilly terrain, with the prominent Mount Rinjani situated at its center and a series of mountains in the northern and southern regions. The central area of Lombok Island is dominated by lowlands, extending from east to west and serving as an agricultural zone. In contrast, Sumbawa Island is marked by mountains running along its length, with lowlands situated between the hills along the northern coast of the island (Pemerintah Provinsi NTB, 2024).

According to the 2023 BPS data, the primary employment sector in NTB Province is predominantly comprised of the agriculture, forestry, and fishery categories. As of August 2023, the percentage of the workforce engaged in this category stood at 33.54 percent (BPS, 2024a). The wholesale and retail trade category followed with 18.32 percent, and the processing industry category reached 12.37 percent. The significant employment in the agricultural sector was also evident in the substantial agricultural land in NTB province, which accounted for 13.22%. The Central Lombok District boosted the largest agricultural land area at 44.97% compared to its total area.

Climate Change in West Nusa Tenggara Province

McGregor *et al. (*2016) have identified shifts in the precipitation and escalating temperatures in the West Nusa Tenggara region based on regional climate projections. The changes in climate parameters, including temperature and precipitation, are projected to influence water quality and quantity in the coming years. As a result, the water resources sector is expected to be affected as noted by Duran *et al. (*2017). The profound effects of climate change on water resources in Indonesia are underscored by the increasing frequency of floods and droughts.

The BMKG rainfall forecast data dated June 10, 2024, indicated that the West Nusa Tenggara Province would be likely to experience reduced rainfall. This potential decline in precipitation in the region is worrisome for the continuity of agricultural production (Surmaini *et al.,* 2011), especially in the West Nusa Tenggara (NTB) area, which serves as Indonesia's primary rice-producing region. The Meteorology, Climatology and Geophysics Agency (BMKG) of NTB Province has highlighted the risk of long-term droughts in 2024 due to climate change, with rice cultivation facing a high probability of crop failure (BMKG, 2024).

Economic Growth of West Nusa Tenggara

The BPS data from 2024 reveals the noticeable influence of climate change on the economic growth of the agricultural sector. In the first quarter of 2024, West Nusa Tenggara experienced a 4.75 percent growth compared to the same period in 2023. This growth was observed in 16 business fields, with only one business field experiencing contraction. Notably, Mining and Quarrying saw a growth of 12.48 percent, Construction at 9.46 percent, and Government Administration, Defense and Compulsory Social Security at 8.71 percent.

Additionally, Information and Communication grew by 8.16 percent, Electricity and Gas Procurement by 6.50 percent, and Health Services and Social Activities by 6.37 percent. However, Agriculture, Forestry, and Fisheries experienced a contraction of 4.13 percent, indicating the significant impact of climate change on economic growth in the agricultural sector in NTB (BPS, 2024b).

The Structural Model Test

Hair *et al. (*2022) suggests conducting various tests to evaluate the structural model, including the common method bias test, multicollinearity test, coefficient of determination test, and predictive relevance test. The results of the tests indicate the absence of common method bias and collinearity, with VIF values below 5 (Kock, 2015). The adjusted R^2 values for the rice production and GRDP variables are 0.257 and 0.763, respectively, suggesting that the exogenous variables moderately influence the endogenous variables (Hair *et al.,* 2022). Moreover, the predictive relevance values (Q2) for the GRDP and Rice Production variables are 0.763 and 0.266, respectively, indicating that the research model has good predictive capabilities as the values exceed zero (Chin, 1998).

RESULT AND DISCUSSION

Descriptive Statistics

The mean values of the measurement items related to the KUR distribution, rice production, and GRDP variables demonstrate that the data tends to be centered between the minimum and maximum scales. Additionally, the standard deviation values exhibit variability, suggesting a diverse distribution of respondent data around the mean. The overall standard deviation value which is lower than the mean value in each variable indicates that the indicator items meet the data normality requirements (Hair *et al*., 2022). Hair *et al.* (2022) recommends using PLS-SEM in testing complex models such as testing mediating variables because it is more efficient in data processing. In addition, because the data measurement of each variable is not the same, the data is converted first using the ln function. The results of the descriptive statistical tests are presented in Table 1.

Table 1 Descriptive Statistic

Name	Mean	Median	Std. dev
ln_KUR distribution	21.017	21.172	1.878
ln_rice production	11.425	11.744	1.121
ln_economic growth	13.781	14.623	2.461

Source: Data processed (2024)

The distribution of KUR in the rice farming sector in NTB Province was mainly dominated by Micro KUR distribution. The total distribution of Micro KUR from 2019 to 2023 reached IDR376,801,182,233.00, while the distribution of Small KUR during the same period amounted to IDR77,942,277,844.00. The peak distribution of Micro KUR was observed in 2022, totaling IDR101,344,150,000, whereas the highest distribution of Small KUR was recorded in 2021, amounting to IDR23,442,977,844. The surge in KUR

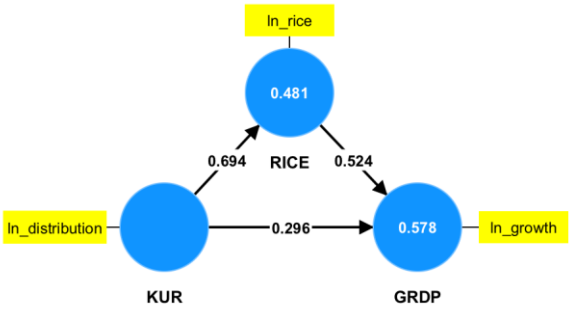
distribution in the rice farming sector during 2021 and 2022 might be attributed to the national economic recovery program known as *pemulihan ekonomi nasional* (PEN), which provided additional interest/margin subsidies to KUR recipients, resulting in a 0% interest/margin rate for them. The implementation of the PEN program in Indonesia aimed to stimulate economic growth in response to the challenges posed by the COVID-19 pandemic.

The data revealed a drop in the rice production during 2020 due to the impact of the COVID-19 pandemic, followed by a recovery in 2021. Likewise, the GRDP within the agricultural sector experienced a decline in 2020 but saw an upturn in 2021. The distribution of Micro KUR in the rice farming sector exceeds that of Small KUR in the agriculture sector, indicating that a significant proportion of the farmers in NTB are smallholders without the required collateral for Small KUR acquisition.

Hypothesis Testing

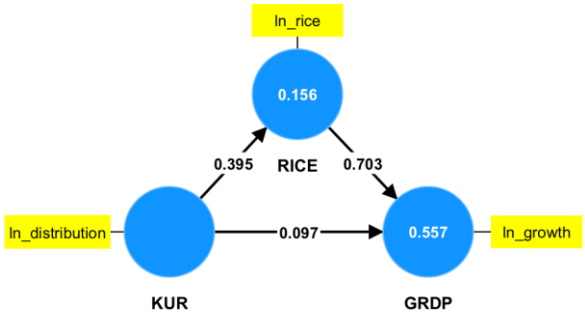
Figure 2 shows the results of the model analysis on Micro KUR, while Figure 3 shows the results of the model analysis on Small KUR.

Figure 2 Test Result on KUR Micro



Source: Data processed from SmartPLS (2024)

Figure 3 Test Result on KUR Small



Source: Data processed from SmartPLS (2024)

The findings reveal that the effect of Micro KUR distribution on the rice production in NTB is both positive and significant (β=0.694; p-value=0.000). However, the impact of Micro KUR distribution on the GRDP of the agricultural sector is statistically insignificant (β=0.296; p-value=0.081). On the other hand, the influence of the Micro KUR of rice production on the GRDP of the agricultural sector is demonstrated to be positive and significant (β=0.524; p-value=0.000).

Additionally, the findings regarding the influence of Small KUR distribution on the rice production in NTB indicate a positive and significant effect (β=0.395; p-value=0.001). In contrast, the effect of Small KUR distribution on the GRDP of the agricultural sector is statistically insignificant (β=0.097; p-value=0.390). Nonetheless, the impact of the Small KUR of rice production on the GRDP of the agricultural sector is both positive and significant (β=0.703; p-value=0.000). Therefore, it can be inferred that KUR (including both Micro KUR and Small KUR) has a positive and significant effect on the rice paddy production in NTB, thus supporting H1, while rice paddy production positively and significantly influences GRDP, which consequently supports H3. However, H2 is not supported as the distribution of KUR (both Micro KUR and Small KUR) does not significantly affect GRDP.

In addition, the outcomes of the examination into the influence of rice production mediation on the correlation between KUR distribution and the GRDP of the agricultural sector demonstrate a significant and positive result on both Micro KUR (β=0.364; p-value=0.000) and Small KUR (β=0.278; p-value=0.002);

therefore, H4 is supported. According to Hair *et al. (*2022), in situations where the direct impact between the dependent and independent variables is not significant but the indirect impact is significant, this form of mediation is known as full mediation (Hair *et al.,* 2022). Table 2 provides a summary of the results obtained from the hypothesis testing through the path coefficient analysis in SmartPLS 4.0.

Table 2 Hypothesis test results

H	Effects	KUR Micro		KUR Small	
		β	P-values	β	P-values
H1	KUR→ RICE	0.694	0.000*	0.395	0.001*
H2	KUR→GRDP	0.296	0.081	0.097	0.390
H3	RICE→GRDP	0.524	0.000*	0.703	0.000*
H4	KUR→RICE→GRDP	0.364	0.000*	0.278	0.002*

Notes: Source: Data processed (2024)

*p-value significant at 0.05 or 5 percent

KUR= KUR distribution in the rice farming sector; RICE= Rice production; GRDP= GRDP in the agriculture sector.

Based on the results of the coefficient analysis in Table 2, the econometric model can be written as follows:

$GRDP = 0.296KUR_{Micro} + 0.524RICE + e$

$GRDP = 0.097KUR_{Small} + 0.703RICE + e$

The model demonstrates the relationship between Micro KUR, Small KUR, and rice production (RICE) in terms of their effects on the Gross Regional Domestic Product (GRDP) of NTB. The analysis shows that the coefficient of Small KUR is inferior to that of Micro KUR. Nonetheless, it is imperative to conduct further investigation to validate this conclusion.

To examine potential variations in the impact of Micro KUR and Small KUR distribution on the GRDP of the agricultural sector in NTB Province, a multi-group analysis was carried out using SmartPLS 4.0. Table 3 shows the results of the test of differences in the effect of Micro KUR and Small KUR distribution on the rice production and economic growth in NTB using the multi group analysis on SmartPLS 4.0. According to Hair *et al. (*2022), to confirm the significance of the relationship under investigation, the p-value should be lower than 0.05.

Table 3 Multi-group analysis results

Effects	Δβ	P-values
KUR→ RICE	0.299	0.050
KUR→GRDP	0.199	0.302
RICE→GRDP	-0.178	0.218
KUR→RICE→GRDP	0.086	0.461

Notes: Source: Data processed (2024)

*p-value significant at 0.05 or 5 percent

Δβ is the delta value of the path coefficient between KUR micro and KUR small

KUR= KUR distribution in the rice farming sector; RICE= Rice production; GRDP= GRDP in the agriculture sector.

According to the findings in Table 3, derived from a bootstrap multi-group analysis, there is no significant distinction between Micro KUR and Small KUR concerning the effects of KUR on RICE (Δβ=0.299; p-value=0.050), KUR on GRDP (Δβ=0.199; p-value=0.302), RICE on GRDP (Δβ=-0.178; p-value=0.218), and the mediating effect of RICE in the correlation between KUR and GRDP (Δβ=0.086; p-value=0.461). This demonstrates that Micro KUR has an influence on rice production and economic growth that is neither stronger nor weaker than that of Small KUR.

Discussion

The research yields several findings based on the hypothesis testing conducted. The initial finding suggests that the distribution of KUR in the rice farming sector has a positive and significant impact on the rice production in NTB Province. The provision of credit for the agricultural sector empowers farmers to utilize mitigation and adaptation technologies to address climate change. Through the adoption of such technologies as superior and low-emission varieties, farmers can enhance their resilience and increase rice production despite droughts as opposed to using rice varieties that lack drought resistance.

Additionally, the use of superior rice varieties leads to reduced risk of crop failure, lower rice production costs, and increased profits for farmers. This finding corroborates previous research indicating

that credit provision in the agricultural sector has a positive and significant effect on rice agricultural production (Chandio *et al.,* 2018). However, the data on KUR distribution in 2024 reveals that the total KUR distribution in the rice farming sector remains relatively small (1.86%) compared to the overall KUR distribution in NTB Province. Given the importance of the rice farming sector, it is crucial for the government to facilitate farmers' access to KUR in this sector.

The second finding demonstrates that the distribution of KUR in the rice farming sector does not have a significant effect on the economic growth of the agricultural sector. This indicates that the allocation of KUR in the agricultural sector may not necessarily lead to an increase in the GRDP of the agricultural sector in a specific region unless there is a corresponding rise in the agricultural productivity. It is essential for the government and KUR providers to offer support, monitor, and evaluate the distribution of KUR in the agricultural sector to ensure that KUR is utilized effectively to enhance agricultural productivity. These findings also suggest that if KUR is not utilized for operational purposes and investments, the distribution of KUR will not affect economic growth.

The third finding demonstrates that the enhancement of rice production plays a crucial role in fostering economic growth in the agricultural sector of NTB Province. As rice production levels increase, farmers' profits also witness a surge. This rise in profits empowers farmers to invest in agricultural technology, boost their agricultural output, adopt superior seeds that are eco-friendly and resilient to droughts, enhance production efficiency, and potentially create new employment opportunities in the agricultural domain. Moreover, the escalation in the rice production in the NTB region will result in an increase in the GRDP of the agricultural sector in this region. Hence, the upsurge in the rice production yields a positive impact on the economic progress of the agricultural sector in NTB.

The fourth finding demonstrates that the relationship between KUR distribution and economic growth in NTB Province is mediated by the rice production. This reinforces previous results that indicate a positive impact of KUR distribution in the agricultural sector on the rice production and a subsequent positive effect of rice production on the GRDP in the agricultural sector in NTB Province. Upon revisiting the second finding, which suggests that KUR distribution does not significantly affect the GRDP of the agricultural sector in NTB, it can be inferred that rice production serves as a complete mediator in the relationship between KUR distribution and GRDP of the agricultural sector (Hair *et al.,* 2022). These findings underscore the importance of optimizing KUR distribution in the rice farming sector to enhance rice production and subsequently boost the GRDP of the agricultural sector in NTB. Therefore, it is imperative for the central and regional governments, along with KUR distributors, to oversee and assess the utilization of KUR in the rice farming sector. Furthermore, the government and KUR distributors should offer support to rice farmers to enable them to leverage their access to KUR for the adoption of agricultural technologies that promote increased rice productivity.

In addition, the multi-group analysis results demonstrate that there is no substantial difference in the impact of Micro KUR and Small KUR on the economic growth in the agricultural sector in NTB. Therefore, the allocation of KUR in the agricultural sector can be carried out without prioritizing one of the schemes. However, due to the limited capacity of smallholders to provide additional KUR collateral, it is expected that KUR distributors can allocate Micro KUR and Super-micro KUR for the farmers in NTB.

Given the impact of climate change in NTB, it is essential to reorient the distribution of KUR in the agricultural sector towards the adoption of mitigation and adaptation technologies. This includes the provision of climate-resistant agricultural seeds. Collaboration between the central government and local authorities is crucial in educating farmers about these technologies to address the challenges of climate change in NTB. Additionally, ensuring easy access to KUR financing for farmers in the agricultural sector is vital, particularly in supporting sustainable finance that contributes to environmental, social, and governance aspects.

CONCLUSION

This research provides theoretical validation for the priority theory of sustainable finance that posits the extent to which governments strive to attain sustainable finance objectives in a specific region which is directly influenced by the emphasis placed on the sustainable finance agenda in that country or area (Wilson, 2010). The government demonstrates this by emphasizing the necessity to allocate funds to the rice farming sector, particularly in NTB Province, to address the anticipated droughts and other impact of climate change. By ensuring that rice farmers have access to credit, it is expected that they will be better equipped to implement adaptation and mitigation technologies, thereby enhancing their agricultural productivity and contributing to the economic growth in NTB.

This study is limited in its ability to analyze climate and rainfall projections for 2024 at the district/city level in NTB Province due to restricted access to historical data. Consequently, the research cannot suggest the prioritization of districts/cities for KUR distribution that may be affected by droughts in 2024.

Therefore, future research should incorporate climate and rainfall projection data to assess the risk of rice crop failure and provide recommendations for KUR distribution in each district/city in NTB Province.

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REFERENCE

Bakken, R. (2021, Aug 9). *What is sustainable finance and why is it important?.* Retrieved from Harvard Division of Continuing Education website: https://extension.harvard.edu/blog/what-is-sustainable-finance-and-why-is-it-important

Batung, E. S., Mohammed, K., Kansanga, M. M., Nyantakyi-Frimpong, H., & Luginaah, I. (2023). Credit access and perceived climate change resilience of smallholder farmers in semi-arid northern Ghana. *Environment, Development and Sustainability, 25*(1), 321–350. https://doi.org/10.1007/s10668-021-02056-x

BMKG. (2024, June 28). *Analisis curah hujan Nusa Tenggara Barat.* Stasiun Klimatologi Nusa Tenggara Barat.

BPS. (2024a, June 28). *Analisis pasar tenaga kerja Nusa Tenggara Barat 2023*. Badan Pusat Statistik Nusa Tenggara Barat.

BPS. (2024b, June 20). *Berita resmi statistik Mei 2024*. Badan Pusat Statistik Nusa Tenggara Barat.

BRIN. (2024, May 15). *Produksi tanaman pangan spasial dan temporal pada perubahan iklim di Indonesia*. Retrieved from Badan Riset dan Inovasi Nasional website: https://www.brin.go.id/news/118564/produksi-tanaman-pangan-spasial-dan-temporal-pada-perubahan-iklim-di-indonesia.

Carter, M. R. (1989). The impact of credit on peasant productivity and differentiation in Nicaragua. *Journal of Development Economics*, *31*(1), 13–36. https://doi.org/10.1016/0304-3878(89)90029-1

Chandio, A. A., Jiang, Y., Wei, F., & Guangshun, X. (2018). Effects of agricultural credit on wheat productivity of small farms in Sindh, Pakistan. *Agricultural Finance Review*, *78*(5), 592–610. https://doi.org/10.1108/afr-02-2017-0010

Chandio, A.A., Jiang, Y., Joyo, M.A. & Rehman, A. (2016). Impact of area under cultivation, water availability, credit disbursement, and fertilizer off-take on wheat production in Pakistan. *Journal of Applied Environmental and Biological Sciences*, *6*(10), 10-18.

Chandio, A.A., Yuansheng, J., Sahito, J.G.M. & Larik, S.A. (2016). Impact of formal credit on agricultural output: evidence from Pakistan. *African Journal of Business Management, 10*(8), 162-168.

Chaudhry, M.G. (2022). Mechanization and agricultural development in Pakistan. *The Pakistan Development Review*, 431–449. https://doi.org/10.30541/v25i4pp.431-449

Chin, W. W. (1998). The partial least squares approach structural equation modeling. Modern methods for business research (G. A. Marcoulides ed. pp. 295–336). Lawrence Erlbaum Associates Publishers.

Direktorat Jenderal Perbendaharaan. (2024). *Sistem informasi kredit program*. Retrieved from Direktorat Jenderal Perbendaharaan Kementerian Keuangan website: https://sikp.kemenkeu.go.id.

Dong, F., Liu, J., & Featherstone, A. (2010). Effects of credit constraints on productivity and rural household income in China. *Agricultural and Applied Economics Working Paper*, 10, WP-516.

Duran-Encalada, J. A., Paucar-Caceres, A., Bandala, E. R., & Wright, G. H. (2017). The impact of global climate change on water quantity and quality: A system dynamics approach to the US–mexican transborder region. *European Journal of Operational Research*, *256*(2), 567–581. https://doi.org/10.1016/j.ejor.2016.06.016

Duy, V. Q. (2015). Access to credit and rice production efficiency of rural households in the Mekong Delta. *Sociology and Anthropology*, *3*(9), 425–433. https://doi.org/10.13189/sa.2015.030901

Etwire, P. M. (2020). The impact of climate change on farming system selection in Ghana. *Agricultural Systems*, 179, 102773. https://doi.org/10.1016/j.agsy.2019.102773

Feder, G., Lau, L. J., Lin, J. Y., & Luo, X. (1990). The relationship between credit and productivity in Chinese agriculture: A microeconomic model of disequilibrium. *American Journal of Agricultural Economics*, *72*(5), 1151–1157. https://doi.org/10.2307/1242524

Food and Agriculture Organization. (2019). *The state of food and agriculture*. Rome: Food and Agriculture Organization of the United Nations.

Gerster, R. (2011). *Sustainable finance: Achievements, challenges, outlook*. Retrieved from Gerster Consulting website: http://www.gersterconsulting.ch/docs/Sustainable_finance_final_11.02.10.pdf.

Hair, Joe, G. Tomas M Hult, Christian M Ringle, & Marko Sarstedt. (2022). *A primer on partial least squares structural equation modeling (PLS-SEM)*. Thousand Oaks: SAGE Publications, Incorporated.

Indonesia. (2024). *Peraturan Menteri Koordinator Bidang Perekonomian Nomor 7 Tahun 2024 tentang Perubahan Kedua atas Peraturan Menteri Koordinator Bidang Perekonomian Nomor 1 Tahun 2022 tentang Pedoman Pelaksanaan Kredit Usaha Rakyat*. Jakarta.

IPCC. (2023). *Climate change 2023: Synthesis report.* contribution of working groups i, ii and iii to the sixth assessment report of the intergovernmental panel on climate change [Core Writing Team, H. Lee and J. Romero (eds.)]. IPCC, Geneva, Switzerland, 35-115.

Iqbal, M. and Kalbe Abbas. (2022). The impact of institutional credit on agricultural production in Pakistan. *The Pakistan Development Review*, 469–485. https://doi.org/10.30541/v42i4iipp.469-485

Kanwil DJPb Provinsi NTB. (2024). *Asset and liabilities commitee regional Nusa Tenggara Barat (ALCo NTB) April 2024*. Mataram: Kantor Wilayah Direktorat Jenderal Perbendaharaan Provinsi Nusa Tenggara Barat.

Khan, N., Jan, I., Rehman, M.U., Mehmood, A. & Akhtar, A. (2007). The effects of short-term agricultural loans scheme of Zarai Tarraqiati Bank on increase in farm production in district Karak. *Sarhad Journal of Agriculture*, *23*(4), 1285-1290.

Marie, M., Yirga, F., Haile, M., & Tquabo, F., (2020). Farmers' choices and factors affecting adoption of climate change adaptation strategies: evidence from northwestern Ethiopia. *Heliyon, 6*(4), e03867. https://doi.org/10.1016/j.heliyon.2020.e03867

Matsuyama, K. (1992). Agricultural Productivity, comparative advantage, and economic growth. *Journal of Economic Theory*, *58*(2), 317–334. https://doi.org/10.1016/0022-0531(92)90057-o

McGregor, J. L., Nguyen, K. C., Kirono, D. G. C., & Katzfey, J. J. (2016). High-resolution climate projections for the islands of Lombok and Sumbawa, Nusa Tenggara Barat Province, Indonesia: Challenges and implications. *Climate Risk Management*, *12*, 32–44. https://doi.org/10.1016/j.crm.2015.10.001

Migliorelli, M. (2021). What do we mean by sustainable finance? assessing existing frameworks and policy risks. *Sustainability*, *13*(2), 975. https://doi.org/10.3390/su13020975

Miller, C. J., & Ladman, J. R. (1983). Factors impeding credit use in small-farm households in Bolivia. *The Journal of Development Studies*, *19*(4), 522–538. https://doi.org/10.1080/00220388308421880

Nasir, J. (2007, Oct 17). *Downsize of informal agricultural credit*. Retrieved from Dawn website: http://www.dawn.com/2007/10/17/ebr13.htm.

Ojo, T.O., Baiyegunhi, L. J. S. (2020). Impact of climate change adaptation strategies on rice productivity in south-west, Nigeria: An endogeneity corrected stochastic frontier model. *Science of the Total Environment*, 745, 141151. https://doi.org/10.1016/j.scitotenv.2020.141151

Ojo, T. O., Adetoro, A. A., Ogundeji, A. A., & Belle, J. A. (2021). Quantifying the determinants of climate change adaptation strategies and farmers' access to credit in South Africa. *Science of the Total Environment*, 792, 148499. https://doi.org/10.1016/j.scitotenv.2021.148499

Okurut, F.N., Schoombee, A. & Berg, S. (2005). Credit demand and credit rationing in the informal financial sector in Uganda. *The South African Journal of Economics*, *73*(3), 482–497. https://doi.org/10.1111/j.1813-6982.2005.00033.x

Oman, W., & R. Svartzman. (2021). What justifies sustainable finance measures? Financial-economic interactions and possible implications for policymakers. *CESifo Forum, 22*(3), 3-11.

Ozili, Peterson. K. (2021). Making Sustainble Finance Sustainable. *Financial Internet Quarterly*, *17*(3), 64–70. https://doi.org/10.2478/fiqf-2021-0020

Ozili, Peterson. K. (2023). Theories of sustainable finance. *Managing Global Transitions*, *21*(1). https://doi.org/10.26493/1854-6935.21.5-22

Pemerintah Provinsi NTB. (2024). *Wilayah dan administrasi pemerintahan Provinsi Nusa Tenggara Barat*. Pemerintah Provinsi Nusa Tenggara Barat. Retrieve from Pemerintah Provinsi NTB website: https://ntbprov.go.id.

Reyes, A., Lensink, R., Kuyvenhoven, A., & Moll, H. (2012). Impact of access to credit on farm productivity of fruit and vegetable growers in Chile. *Agricultural and Applied Economics*, 1-31.

Ryszawska, B. (2016). Sustainability Transition Needs Sustainable Finance. *Copernican Journal of Finance & Accounting*, *5*(1), 185-194. https://doi.org/10.12775/cjfa.2016.011

Salinger, M. J. (2005). Climate variability and change: Past, present and future – an overview. *Climatic Change*, *70*(1–2), 9–29. https://doi.org/10.1007/s10584-005-5936-x

Sani, S., Haji, J., & Goshu, D. (2016). Climate change adaptation strategies of smallholder farmers: The case of Assosa District, Western Ethiopia. *Journal of Environment and Earth Science*, 6, 9-15.

Schumacher, K., Chenet, H., & Volz, U. (2020). Sustainable finance in Japan. *Journal of Sustainable Finance and Investment*, *10*(2), 213–246. https://doi.org/10.1080/20430795.2020.1735219

Shrestha, C.M. (1992). Institutional credit as a catalyst for agricultural sector growth: evidence from Nepal. *Journal of Economic Development*, *17*(2), 137-144.

Sial, M. H., & Carter, M. R. (1996). Financial market efficiency in an agrarian economy: Microeconometric analysis of the Pakistani punjab. *Journal of Development Studies*, *32*(5), 771–798. https://doi.org/10.1080/00220389608422439

Siddiqi, M.W. & Baluch, K.N. (2009). Institutional credit: a policy tool for enhancement of agricultural income of Pakistan. *International Research Journal of Arts and Humanities* (IRJAH), 37, 158-174.

Sivakumar, M. V. K. (2005). Impacts of natural disasters in agriculture, Rangeland and Forestry: An overview. *Natural Disasters and Extreme Events in Agriculture*, 1–22. https://doi.org/10.1007/3-540-28307-2_1

Surmaini, E., Runtunuwu, E., & Las, I. (2011). Upaya sektor pertanian dalam menghadapi perubahan iklim. *Jurnal Litbang Pertanian*, *30*(1), 1-7.

UN. (2024). *Climate change*. United Nations. Retreive from United Nation website: https://indonesia.un.org/en/172909-climate-change.

UNDP. (2007). *The other half of climate change: Why Indonesia must adapt to protect its poorest people*. United Nations Development Programme Indonesia.

Wilson, C. (2010). Why should sustainable finance be given priority? *Accounting Research Journal*, *23*(3), 267–280. https://doi.org/10.1108/10309611011092592

World Bank. (2018). *Third Ghana economic update: agriculture as an engine of growth and jobs creation*. Report, February, 1–63.

Xi, Z. H. U., & Li, Z. N. (2007). Heterogeneous impact of farmer credit: An empirical investigation based on IVQR model. *Systems Engineering-Theory and Practice*, *27*(2), 68–75. https://doi.org/10.1016/s1874-8651(08)60011-3

Yu, C. (2008). Entrepreneurship and credit constraints: Evidence from rural households in China. *Chinese Academy of Science*, 26, 1-11.

Zeller, M., Diagne, A., & Mataya, C. (1998). Market access by smallholder farmers in Malawi: Implications for technology adoption, agricultural productivity and crop income. *Agricultural Economics*, *19*(1–2), 219–229. https://doi.org/10.1111/j.1574-0862.1998.tb00528.x