Characteristics and Managerial Capacity of Rice Farmers Impacting Family Welfare in Tangerang Banten District

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ABSTRACT

The endeavor to enhance rice productivity in Tangerang district, nestled within the confines of Banten Province, has unfortunately not been paralleled by a corresponding improvement in the well-being of its agricultural community. Subjectively, prosperity is often perceived through the lens of familial harmony, while on an objective scale, it is defined by the fulfillment of fundamental human needs. This study sets out to meticulously examine the correlation between the characteristics of farmers and their managerial competencies on the welfare levels of farming households engaged in the cultivation of lowland rice. Specifically, the investigation is concentrated within the Sukamulya District, Tangerang Regency, Banten Province. The methodology embraced in this study is predominantly explanatory-descriptive, drawing insights from an amalgamation of primary and secondary data sources. The focal points of analysis encompass a triad of variables: farmer characteristics, managerial capacity, and farmer welfare. Leveraging Inferential Statistics, with a Structural Equation Modeling (SEM) analytical framework, the research delves into the intricate interplay between these variables. The empirical findings unearth a direct correlation between farmer characteristics and their managerial prowess. Furthermore, it underscores the consequential impact of farmer characteristics, channeled through managerial capacity, on the overall welfare of farmers. The augmentation of household welfare within farming communities predominantly hinges upon the adept management of resources, proficient business acumen, strategic planning capabilities, organizational adeptness, and adaptive resilience demonstrated by farmers and their managerial capacities.

1. Introduction

The agricultural sector, particularly concerning food crops, holds paramount significance as a cornerstone of development. According to Awotide *et al.* (2016), ensuring the accessibility and affordability of food stands as a primary agenda, particularly in the context of development within numerous developing nations. The trajectory of agricultural advancement, specifically in food crop cultivation, places emphasis not solely on augmenting production and productivity, but also on elevating the income and welfare of farmers. Various approaches are employed in the integration of innovative practices, with the overarching goal of fostering a degree of

prosperity for farmers and their households (Rahmat, 2013).

Mastery over resources, such as land ownership, agricultural proficiency, and the capacity to adapt to technological advancements, exhibits a direct correlation with the income levels of farmers. Poor management of resources invariably leads to diminished income levels and consequently, reduced welfare standards. Hence, the extent of resource ownership among farmers is intricately linked with their overall welfare (Murdani, MI 2014). For instance, inadequate control over rice fields and a lack of innovative farming practices signifies a limited capacity among farmers to effectively manage agricultural operations, resulting in insufficient yields. Consequently, this perpetuates low living standards and welfare among farmers (Syafruddin *et al.*, 2018). According to Banten Area Factual Information for 2021, there was a notable decline of 12.8% in rice production during the period spanning from 2011 to 2020 (BPS, 2021). This decline in rice production and efficiency is attributed to a decrease in farmers' income and their control over agricultural resources. Besides production, land availability and food accessibility positively impact farmer welfare (Kadiri & Eze, 2015). The introduction of innovations such as intensified per-planting methods and improved water sources (such as irrigation facilities), as well as the development of agricultural production facilities and market opportunities, also contribute to an enhancement in farmer welfare (Darwanto, 2005). Farmer welfare can be advanced through the regulation of production input costs and the enhancement of production selling prices. Government intervention is crucial in regulating both input and output costs to ultimately increase the Farmers' Exchange Rate (FER), addressing both production input sourcing needs and household consumption requirements. Essentially, improving farmer welfare implies an improvement in meeting household nutritional needs and an elevated standard of living. The measurement of farmer welfare is gauged by the income derived from on-farm, off-farm, and non-farm activities within the family (Danso-Abbeam *et al.*, 2020), with on-farm income contributing significantly at the village level, surpassing other sources.

Several researchers have identified the determining factors influencing farmers' welfare levels by examining various variables. One prominent factor consistently discussed by researchers is the individual characteristics and proficiency of farmers in managing their agricultural enterprises. Hence, the characteristics and capacities of farmers in operating their businesses significantly influence their behavioral patterns within the agricultural sector, under certain situations and conditions (Datau *et al.*, 2019). Tangerang Regency, situated in a coastal area, boasts significant agricultural resource potential characterized by diversity. Therefore, it is imperative to appropriately harness the character and behavior of farmers. Several challenges pertaining to character and capacity arise, including limited availability and ownership of resources such as land complexity, management capacity, and capital ownership. Moreover, specific obstacles concerning small-scale farmers encompass: (i) a low level of education, with only 20% of 100 farmers being educated, leaving 80% uneducated; (ii) restricted land ownership, often leading to landlessness (Rehman & Anwar, 2008); and (iii) inadequate access to capital, technology, and markets (Saragih, FS, and Mariati, R., 2020; Syafruddin *et al.*, 2018). These challenges contribute to lower levels of productivity, income, and family welfare among farmers. Consequently, this scenario underscores the limited capabilities and practices of farmers in managing both food security and household welfare (Herawati *et al.*, 2011).

In accordance with the research conducted by Susilo (2011), Awotide *et al.* (2016), Paltasingh and Goyari (2018), Fruscalso *et al.* (2017), and Syafruddin *et al.* (2018), it is

asserted that numerous factors significantly impact the welfare of farming families. Among these factors, the characteristics of farmers such as their level of formal and non-formal education, age, farming experience, and the size of their family are positively correlated with the welfare level of the farmer's household. Additionally, findings from various studies indicate that both farmer characteristics and their capacity to adopt innovative practices and technology directly influence work productivity and the welfare of farming households (Kuntashula & Mungatana, 2013; Anantanyu, 2011; Aminah, 2015). Furthermore, the ability of farmers to effectively manage their farming activities directly affects their welfare (Komala *et al.*, 2014). Managerial ability, one of the key capacities of farmers, encompasses the adoption and utilization of agricultural innovation and technology, as well as the utilization of information sources, all of which play pivotal roles in enhancing farming productivity and the welfare level of farmers (Ehiakpor *et al.*, 2019; Mariyono, 2019; Tambo & Wünscher, 2017; Yang *et al.*, 2021).

Several studies pertaining to the advancement of the agricultural sector assert, as articulated by Rini Susilawati *et al.* (2021), that enhancing the performance and welfare of farmers can be achieved through various measures, including: (1) augmenting farmers' institutional capacity (Bachke, 2019), (2) bolstering farmers' managerial proficiency (Mariyono, 2019), (3) improving access to information (Tijani *et al.*, 2014; Utami *et al.*, 2018), (4) ensuring land resource ownership and effective management structures (Issahaku & Abdulai, 2020), (5) fostering sustainable agricultural management capabilities (Oyetunde U. *et al.*, 2021), and (6) fortifying agricultural mechanization oversight (Rusastra & Suryadi, 2004).

The development of individual attributes and managerial proficiency among farmers significantly impacts the welfare of both farmers and their families. These dual factors concurrently shape farmer welfare. The objective of this study is to assess the extent to which individual attributes and managerial capabilities contribute to the welfare of farming households, and to devise multiple policy strategies aimed at enhancing farmer welfare. This research focuses on lowland rice farmers, analyzing their farming enterprises in light of their inherent characteristics and those of their families.

2.   Methodology

This investigation employs a descriptive, quantitative exploratory research methodology, specifically a method that delineates and tests relationships and influences among factors, referring to the formulated hypothesis (Singarimbun, 2011). The objective of this research is to ascertain the influence of farmer characteristics, utilization of production inputs, and farmer capability on the level of farmer welfare in Tangerang Regency. Data collection methods involve surveys, interviews, observations, tests, documentation, etc. (Nurdin I and Hartati S., 2014). Data sources include primary data obtained from observational surveys and interviews as well as secondary data derived from literature reviews and prior research.

Sample selection was conducted in two phases. The initial phase involves determining the districts and sub-districts, namely Sukamulya District, Tangerang Regency, for the following reasons: (1) Tangerang Regency exhibits a positive growth rate in the agricultural sector at 5.73%; (2) Sukamulya District serves as the focal point for lowland rice farming development in Tangerang Regency; (3) this area demonstrates the highest productivity level in lowland rice farming in Tangerang Regency, specifically at 4.45 tons/ha; (4) Sukamulya sub-district contributes significantly to production, accounting for 9.29% of total rice

production in Tangerang Regency (BPS, 2020). Subsequently, the second phase involves sampling respondents, encompassing all rice farmers in Sukamulya District.

The recommended sample size for Structural Equation Modeling (SEM) analysis to ensure the reliability of results is five times the number of indicators, resulting in the acquisition of 80 respondents. Simple random sampling was employed as the sampling technique, leading to a sample comprising 80 rice farmers in the Sukamulya District. The measurement scale utilized in this study is the Likert scale, aimed at assessing attitudes, income levels, and perceptions of individuals or groups towards social phenomena (Haryono, 2017).

The variables under observation in this research are derived from previous studies (Cahyono & Adhiatma, 2016). These variables are categorized as follows:

1. Welfare variables (Y), encompassing farmer income (Y1), household consumption (Y2), family education (Y3), and family health (Y4)
2. Farmer characteristic variables (X), including age (X1), formal education (X2), non-formal education (X3), farming experience (X4), farming area (X5), and number of family members (X6)
3. Farmer capacity variable (Z), consisting of farming behavior (Z1), resource utilization (Z2), business planning ability (Z3), problem-solving ability (Z4), cooperation ability (Z5), and adaptability (Z6)

Data processing and analysis were conducted using inferential statistics, specifically Structural Equation Modeling (SEM) with the LISREL Program. The SEM analysis is constructed based on formative constructs (Haryono, 2017). The structural equation model is presented below, and the framework for conceptualization is outlined as follows:
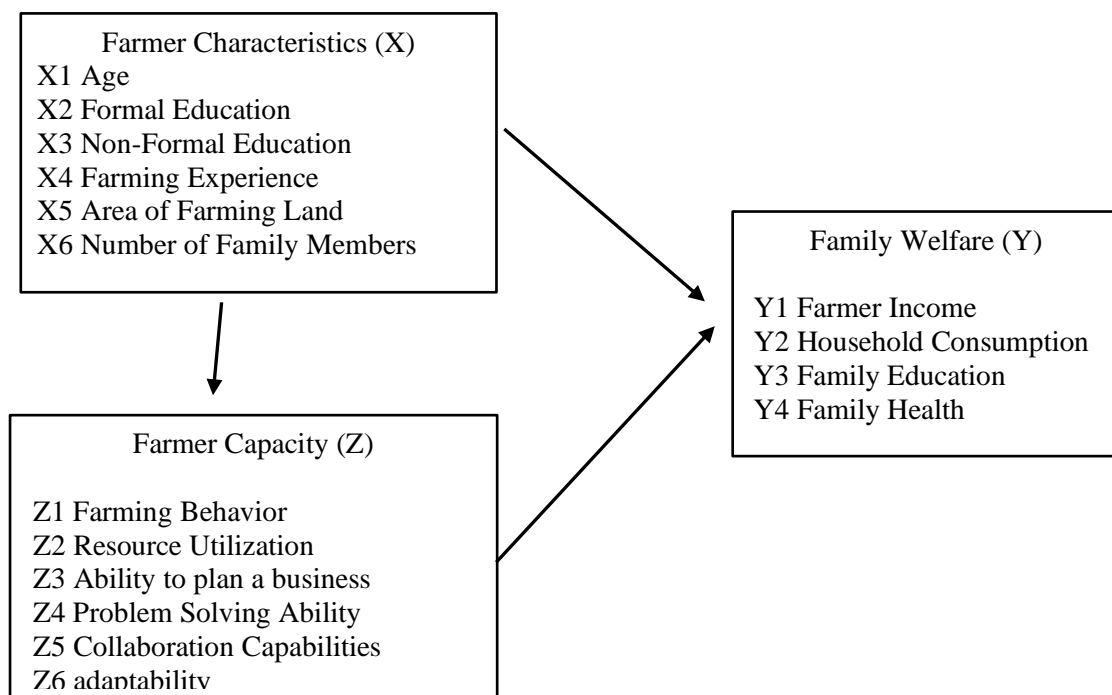

Farmer Characteristics (X)
X1 Age
X2 Formal Education
X3 Non-Formal Education
X4 Farming Experience
X5 Area of Farming Land
X6 Number of Family Members

Family Welfare (Y)

Y1 Farmer Income
Y2 Household Consumption
Y3 Family Education
Y4 Family Health

Farmer Capacity (Z)

Z1 Farming Behavior
Z2 Resource Utilization
Z3 Ability to plan a business
Z4 Problem Solving Ability
Z5 Collaboration Capabilities
Z6 adaptability

Figure 1. Rice Farmers' Thinking Capacity Level Framework Improves Family Welfare

3.   Results and Discussion

3.1   Respondent Characteristics

The demographic analysis reveals that the mean age of respondent farmers is 47.79 years, with 52% falling within the Adult age bracket (36-50 years). Their educational attainment typically encompasses completion of elementary schooling, averaging 7.2 years. Table 1 elucidates that respondents' educational backgrounds predominantly fall within the Moderate to high categories, indicative of a relatively proficient level of knowledge. Non-formal education, which denotes the participation of farmers in training or similar activities aimed at enhancing the capabilities of rice cultivation in Sukamulya District, averages 1.89 sessions per year.

Table 1. Characteristics of Respondents

Variable	Category	Amount	Percentage (%)
Age (years)	1. Very Young (15 - 24)	1	1.25
Average:47.79	2. Young (25 - 35)	8	10.00
	3. Adult (36 - 50)	42	52.50
	4. Old (> 50)	29	36.25
	Total	80	100.00
Formal Education (years)	1. Lower (< 6)	2	2.50
Average: 7.2	2. Moderat (6 - 9)	39	48.75
	3. Height (10 - 12)	36	45.00
	4. Very High (>12)	3	3.75
	Total	80	100.00
Non-Formal Education	1. Lower (< 2)	44	55.00
(times)	2. Moderat (2 - 4)	32	40.00
Average: 1.89	3. High (5 - 7)	2	2.50
	4. Very High (>7)	2	2.50
	Total	80	100.00
Land Tenure (ha)	1. Lower (<0.5)	51	63.75
Average: 0.39	2. Moderat (0.5 - 1)	13	16.25
	3. High (1.1 – 1.5)	8	10.00
	4. Very High (>1.5)	8	10.00
	Total	80	100.00
Rice farming experience	1. Lower (<5)	5	6.25
(years)	2. Moderat (5 - 9)	22	27.50
Average: 8.38	3. High (10 - 15)	50	62.50
	4. Very High (>15)	3	3.75
	Total	80	100.00
Number of Family	1. Lower(< 4)	19	23.75
Dependents (People)	2. Moderat (4 - 6)	46	57.5
Average: 4.19	3. High (7 - 9)	15	18.75
	4. Very High (>9)	0	0.00
	Total	80	100.00

The non-formal education undertaken by respondent farmers generally occurs at a Moderate frequency, typically ranging from 2 to 4 times annually. Increased engagement in non-formal education correlates positively with enhanced skills and proficiency among farmers in lowland rice farming practices, particularly in seed selection, fertilization techniques, and efficient farm management, thereby yielding more profitable outcomes. Regarding land

ownership, the majority of respondent farmers control relatively small parcels, with less than 0.5 hectares (63.75%). These findings align with prior research conducted by Fatchia A (2010), which indicates a prevalent low level of formal education among farmers, often limited to elementary schooling. Land control, as understood within the local context, encompasses various forms of asset management for commercial purposes, including property ownership, leasing, collateralization, or profit-sharing, in accordance with customary laws prevailing in the region.

Experience serves as a significant gauge of a business's efficacy. The prolonged engagement in business activities correlates with an enhanced proficiency in executing said activities. According to the findings outlined in Table 1, the average farming experience among respondents amounted to 8.38 years, with the highest concentration observed within the 10-15 year bracket, comprising 52.50% of participants, categorized as highly experienced individuals.

The count of family members denotes the number of dependents within a household, with an increase in this count correlating to a heightened burden of responsibility. As per the research outcomes, respondent families varied in size, with 46 respondents (57.5%) reporting households comprised of 4-6 members, followed by 19 respondents (23.75%) with 1-3 members, and 15 respondents (18.75%) with 7-9 members. The average number of dependents within respondents' families equated to 4.19 individuals, or rounded to 4 persons

3.2   Managerial Capacity

Capacity refers to an individual's aptitude to execute tasks effectively. Managerial capacity, specifically within the context of farming, delineates a farmer's proficiency in overseeing their agricultural operations to enhance productivity and profitability. Evaluation of managerial capacity encompasses various facets including farming behavior activities ($Z1$), resource utilization ($Z2$), business planning proficiency ($Z3$), problem-solving capabilities ($Z4$), cooperation skills ($Z5$), and adaptability ($Z6$). Generally, lowland rice farmers exhibit a commendable level of proficiency in managing their farming enterprises, spanning from high to moderate across dimensions such as farming behavior, resource allocation, business strategizing, problem resolution, cooperation, and adaptability.

An intriguing aspect unveiled by this research is the farmers' adeptness in uniform tasks, exemplified by their proficiency in customer selection, market analysis, ranking high to very high. Furthermore, the adaptability quotient among farmers demonstrates a significant presence in the high category at 52.5% and very high at 43.75%. Notably, farmer adaptability extends beyond mere managerial decisions regarding cultivated commodities; it encompasses the selection of suitable crop varieties tailored to environmental conditions, particularly water availability. This observation aligns with the findings of prior studies by Farid and Kristanti (2009).

The viability of lowland rice farming is significantly influenced by water resource availability, accounting for approximately 85% of its success (Pranata, *et al.*, 2012). The managerial capacity associated with this agricultural practice is notably high, standing at 64.42%. Particularly noteworthy within this capacity is the farmers' exceptional level of adaptation in executing rice farming activities, which reaches an impressive rate of 43.75%
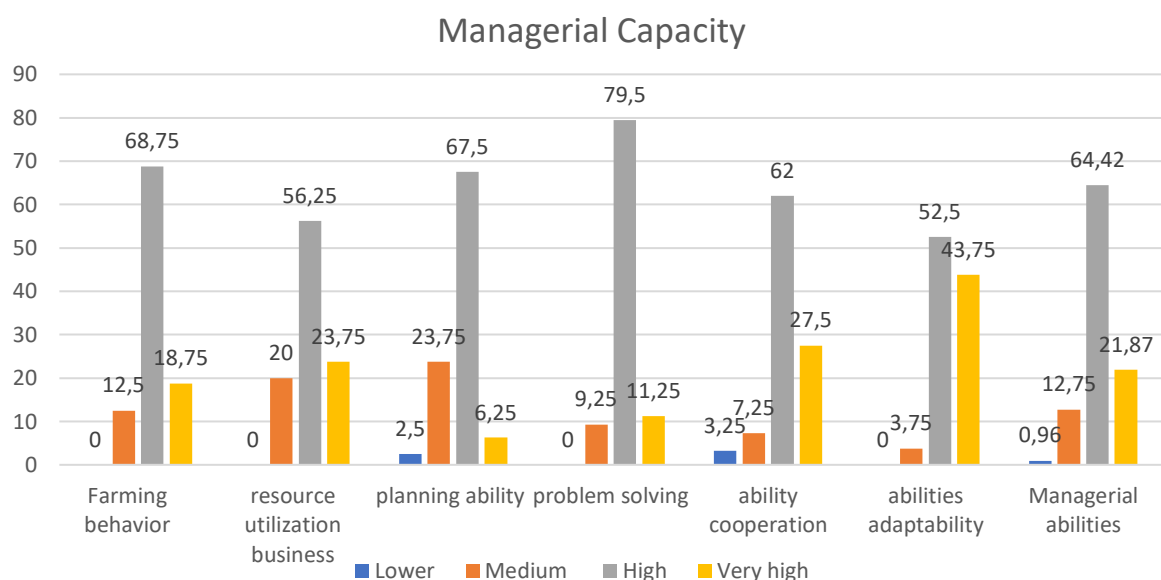
Managerial Capacity

Figure 2. Farmers' Rice Field Management Capacity in Sukamulya District

3.3   Farmer Family Welfare

Well-being can be construed as a state reflecting social welfare, encompassing the fulfillment of both material and non-material needs. Midgley defines social welfare as the state of human well-being. Conditions of prosperity emerge when human life is secure and content due to the satisfaction of fundamental needs such as nutrition, health, education, shelter, and income, as well as the availability of protection against significant risks (Salamah, 2012).

In various studies, the welfare of farmers is assessed through multiple indicators, including: a) Development of Income Structure; b) Food Expenditure; and c) Development of Farmer Exchange Rates (Rahmat, 2013). Prosperous farmers are those who can sustain their daily necessities through their earnings (Datau *et al.*, 2019). Subsequently, Datau *et al.* (2019) assert that welfare levels are determined by the comparison between income and expenditure, enabling the assessment of farmers' welfare in their activities through the exchange rate of household income.

Based on Figure 3, it is elucidated that 43.8% of lowland rice farmers' income falls within the Moderate category (Rp. 7.5 million - Rp. 15 million) per season. The income level of rice farmers is contingent upon the production level of agricultural commodities and the prices garnered by farmers. Farmers with small landholdings (<0.5 Ha) typically function as price takers, as evidenced by Datau *et al.* (2019), Racmat (2013), and Paranata A (2011). These studies reveal that household income of farmers is influenced by farming typology (such as climate, land area, and resource availability), as well as the Farmer Exchange Value (FER) received. FER represents a comparison between the Price Paid Index by Farmers and the Price Index Paid by Farmers (BPS 2022).

In terms of food availability, farmers with limited land area often store rice as a reserve (buffer) until the subsequent harvest season, given that rice constitutes the primary energy source for most individuals, while non-rice energy predominantly originates from cassava, although its acceptance remains limited (Yudaningrum, 2011).
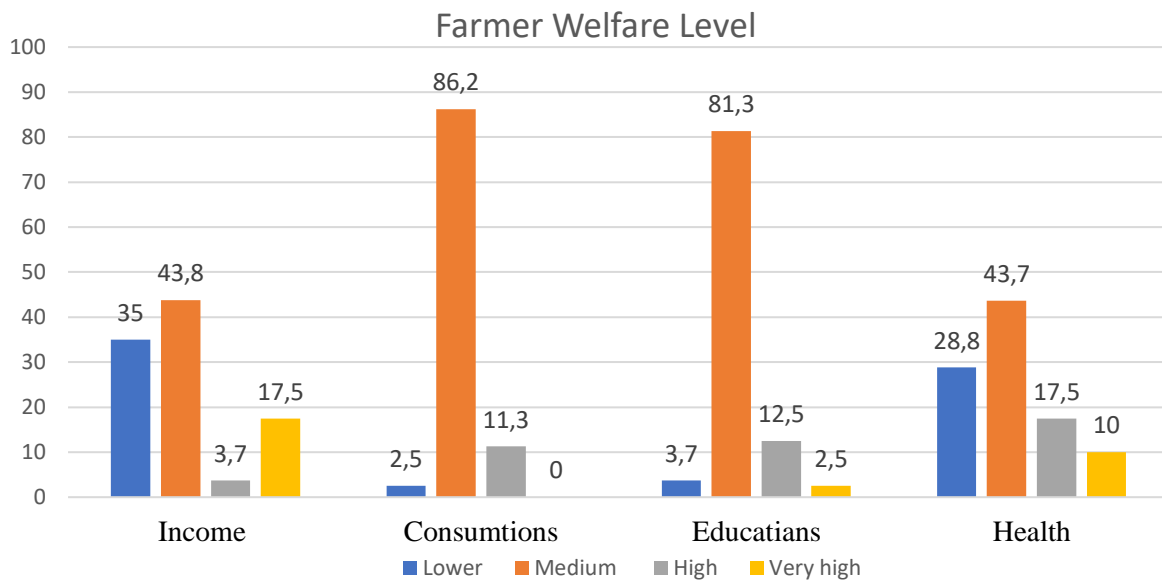
Figure 3. Farmer Welfare Level based on selected variables.

The consumption level observed falls within the Moderate category, indicating that welfare is predominantly perceived through the accessibility of food sources (specifically rice), without significant consideration for supplementary ingredients. Maintaining adequate quantity and quality of available food, consumption levels (including Calories, Carbohydrates, and Protein/KKP) serve as crucial indicators of household food welfare (Arida A *et al.*, 2015). Nevertheless, instances have been documented where food provision was ensured as long as rice was available.

Government initiatives such as the mandatory 9-year education program and the implementation of the Healthy Indonesia Card (HIC) have contributed to enhancing the welfare of farming households. Research findings illustrate that family education and health indicators align with the Moderate category, as depicted in Figure 3. Elevated family expenditures are attributed to the Covid-19 pandemic and the persistent fluctuations in the inflation rate, posing challenges to goal attainment. Family members' engagement in education and healthcare further impacts welfare outcomes. Correspondingly, Figure 3 delineates that family involvement in the healthcare sector predominantly falls within the low to Moderate category.

3.4 Factors that Influence the Welfare of Lowland rice Farmers

The results of SEM analysis utilizing the Lisrel 8.72 program, as depicted in Table 2 and Figure 4, indicate a direct correlation between farmers' Managerial Capacity and their aptitude in managing agricultural enterprises. Figure 3 elucidates that farmer characteristics, namely Formal Education (X2), Farming Experience (X4), Farming Land Area (X5), and Family Size (X6), collectively contribute to managerial capacity by 0.72 or 59.8%. These farmer characteristics, both independently and through their influence on managerial abilities, significantly contribute to farmers' welfare, with loading factor values of 0.51 or 45% and 0.78 or 65%, respectively.

Managerial capacity, bolstered by indicators of Farming Behavior such as Resource Utilization (Z2), Business Plan Competence (Z3), Problem-Solving Proficiency (Z4),

Teamwork Skills (Z5), and Adaptability (Z6), substantially enhances the welfare of rice farming households. The welfare of these families reflects the degree of satisfaction of fundamental living requisites, gauged through indicators including Farmer Income (Y1), Household Consumption (Y2), Family Education (Y3), and Family Health (Y4), as delineated in Table 2. Farmer characteristics, via selected indicators, exert a direct influence on both managerial capacity and family welfare.

This discovery aligns with prior research by Maramba (2018), asserting that farmer characteristics, particularly experience and landholding, are pivotal determinants of welfare. Additionally, research by Awotide, Karimov, and Diagne (2016), and Paltasingh and Goyari (2018), underscores the positive impact of farmer education on welfare. Moreover, findings by Fruscalso Antillón and Hötzel (2017), and Syafruddin *et al.* (2018), emphasize the influence of age, farming experience, and family size on farmer welfare. Furthermore, studies by Daulay and Sanny (2019), Nasution (2020), and Suandi, Damayanti, and Yulismi (2012), affirm that farmer characteristics significantly shape the welfare of their families. Thus, based on these research outcomes, farmer attributes encompassing education, experience, landholding, and family size emerge as pivotal factors in determining farmer welfare.

Table 2. Cross Loading Discriminant Validity Results

Variables/indicators	Direct	Indirect	Total	T value	R value ^{2}
			Influence on Z		
X1.2 (Formal education)	0.67	0	0.67	4.38	
X1.4 (farming experience)	0.55	0	0.55	3.41	0.71
X1.5 (Area of Agricultural Land)	0.56	0	0.56	4.25	
X1.6 (Number of family members)	0.76	0	0.76	3.45	
			Influence on Y		
X1.2 Formal education)	0.67	0.52	1.19		
X1.4 (farming experience)	0.55	0.42	0.97		
X1.5 (Area of Agricultural Land)	0.56	0.43	0.99		
X1.6 (Number of family members)	0.76	0.59	1.35		
Z1.1 (Farming Behavior)	0.65	0	0.65	3.25	0.69
Z1.2 (Resource Utilization)	0.75	0	0.75	2.74	
Z1.3 (Agricultural Planning)	0.65	0	0.65	2.89	
Z1.4 (Resolving Issues)	0.55	0	0.55	3.57	
Z1.5 (Collaboration Capability)	0.64	0	0.64	6.87	
Z1.6, (Adaptive power)	0.58	0	0.58	5.71	

Source: Processed Data, 2023

Various research findings indicate that the characteristics of farmers have a significant impact on family welfare. Put differently, a farmer's welfare tends to increase with favorable personal attributes. It is imperative for farmers to possess individual traits that enhance their productivity and income (Aminah, S. 2015; Mariyono, 2019; Utami *et al.*, 2018; Rustandi *et al.*, 2020).

Farmer Managerial Capacity refers to the proficiency farmers exhibit in managing their agricultural endeavors. The success of lowland rice farming hinges on augmenting production per unit area, thereby increasing income and farmer competence, which encompasses behavioral aspects in farming (knowledge, attitudes, and skills), resource utilization, business planning, and problem-solving. Cooperative and adaptive capacities in livestock management are integral components in enhancing welfare.
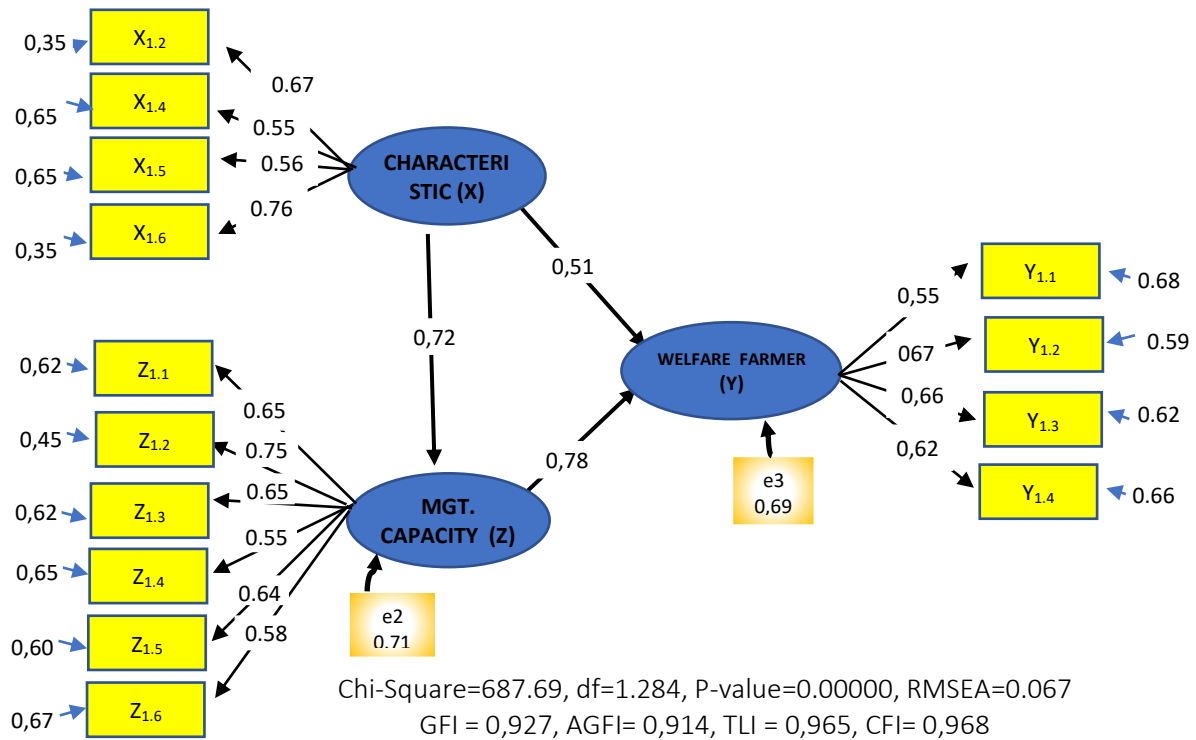
Figure 3. SEM Analysis of Factors Affecting the Welfare of Rice Farming Families

This aligns with research by Ehiakpor *et al.* (2019), Mariyono (2019), and Yang *et al.* (2001), asserting that farmer capacity positively influences farming productivity and welfare. Analysis of the research outcomes in Table 3 reveals that characteristics such as formal education (X2), farming experience (X4), business land area (X5), and family size (X6) significantly contribute to enhancing farmer capacity and welfare.

The capacity of farmers to conduct agricultural activities efficiently is pivotal for agricultural development, particularly in elevating their welfare. Farmer capacity encompasses knowledge, attitudes, and skills (Z1); resource utilization abilities (Z2); business planning (Z3); problem-solving (Z4); collaboration (Z5); and adaptability (Z6). Consequently, improved managerial skills in farming operations enable farmers to enhance their welfare, as advocated by Kahan (2008) and Thomas (2018), who emphasize the importance of managerial skills in anticipating and mitigating potential challenges to achieve business success.

The level of farmer welfare is gauged through indicators such as Farming Income (Y1), family consumption (Y2), Family Education (Y3), and Family Health (Y4), offering insights into sustainable welfare. However, the welfare status of rice farming families in the research locale remains suboptimal, as depicted in Table 2, where average income, consumption, education, and health levels indicate moderate welfare. Thus, augmenting the managerial capacity of farmers, particularly by enhancing farming practices (knowledge, attitudes, and skills) in production management, cultivation techniques, and market understanding, is crucial for elevating rice farmers' income and, consequently, their family welfare.

Table 3. Relationship Between Indicators and Latent Variables

Variable	Loading Factor	*Standard Error*	*T statistics*	*Information*
Characteristics of Farmers				
X2 (Formal education)	0.67	0.291	4.38	Important
X4 (farming experience)	0.55	0.088	3.41	Important
X5 (Agricultural Land)	0.56	0.092	4.25	Important
X6 (Number of family members)	0.76	0.110	3.45	Important
Managerial Capacity				
Z1 (Farming Behavior)	0.65	0.211	3.25	Important
Z2 (Resource Utilization)	0.75	0.059	2.74	Important
Z3 (Agricultural Planning)	0.65	0.132	2.89	Important
Z4 (Troubleshooting)	0.55	0.151	3.57	Important
Z5 (Cooperation Capability)	0.64	0.162	6.87	Important
Z6, (adaptive power)	0.58	0.155	5.71	Important
Welfare Farmers				
Y1 (Agricultural Income)	0.55	0.176	2.76	Important
Y2 (Family Consumption)	0.67	0.235	4.21	Important
Y3 (Family education)	0.66	0.224	4.24	Important
Y4. (Family Health)	0.62	0.241	3.52	Important
X → Z	0.72	0.131	6.74	Important
X → Y	0.51	0.123	3.31	Important
Z → Y	0.78	0.111	6.49	Important

Note: DF=NK (80-3=77), N=number of K samples =number of variables (constructs)
      *Significant level at 1%

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4.   Conclusion

Enhancing the welfare of farmers can be achieved through bolstering their adaptive capacity in navigating obstacles, challenges, and threats within agricultural enterprises. Thus, as the primary stakeholders in livestock operations, farmers must discern farming potentials, capitalize on opportunities, address agricultural issues, and safeguard their farming resources. There is a pressing need to augment farmers' knowledge, attitudes, and skills to promptly tackle all issues pertaining to production facilities, cultivation, technology, markets, and capital. Adaptability can augment farmers' access to inputs, capital resources, and markets. The realization of farmers' welfare operates at a micro level, necessitating governmental involvement, particularly in regulating the farmers' exchange rate (FER) to empower farmers as price takers. This entails: (1) maintaining continuous oversight of agricultural activities; (2) facilitating diverse agribusiness endeavors in alignment with farmers' requirements, including provisioning of production facilities, market expansion, and dissemination of relevant innovation and information; (3) enhancing farmer competencies (knowledge, skills, and attitudes) through the engagement of field instructors; and (4) refining farming management capabilities to address prevailing challenges.

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