



Debt and sustainable poverty reduction: A case study of Dao ethnic women in the northern midlands and mountains region of Vietnam

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Abstract

The purpose of this study is to explore the debt of Dao ethnic women in Vietnam and its impact on sustainable poverty reduction. A mixed-methods approach was employed, combining in-depth interviews with experts for scale development and quantitative data collection from 206 Dao women in the Northern Midlands and Mountains region of Vietnam. Parental and agricultural debt contribute to sustainable poverty reduction, while wedding debt has no significant impact as it is used for non-productive purposes. To effectively reduce poverty among ethnic women, especially in rural regions, the study concludes that priority should be given to promoting productive debt for income-generating activities and providing flexible loan terms. Wedding debt, which burdens families without creating economic benefits, should be discouraged. Improving financial literacy and fostering systemic changes to support marginalized communities are essential for sustainable poverty reduction. The study suggests that microfinance initiatives should prioritize productive loans for income-generating activities, support financial literacy programs tailored for ethnic women, and create policies that reduce the socio-cultural and economic barriers these women face. By focusing on flexible, productive debt and discouraging non-productive borrowing for ceremonies, poverty reduction efforts can be effective and sustainable in marginalized communities.

Keywords: Dao women, Debt, Ethnic women, Northern midlands and mountains region, Sustainable poverty alleviation, Sustainable poverty reduction.

JEL Classification: F63; Q01; R11.

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Contribution of this paper to the literature

This study is original in its focus on the impact of debt types on sustainable poverty reduction, specifically for Dao ethnic women in Vietnam's Northern Midlands and Mountains region, an underexplored area. It combines qualitative insights to develop measurement scales with quantitative data to examine these influences.

1. Introduction

Sustainable poverty reduction remains a cornerstone of global development efforts, underscored by its prioritization in the United Nations' Sustainable Development Goals (SDGs), particularly the first goal of SDG is "No Poverty" (UN (United Nations), 2015). Despite significant progress in reducing poverty over the past few decades, approximately 9.2% of the global population around 700 million people continue to live on less than \$2.15 per day, as defined by the World Bank's updated international poverty line (World Bank, 2022). The persistent challenge of eradicating poverty is compounded by structural economic inequalities, limited access to essential resources, and external shocks such as climate change and global economic downturns (Olinto, Beegle, Sobrado, & Uematsu, 2013). Within this context, debt has emerged as a powerful, albeit double-edged, instrument in poverty reduction strategies. Initiatives such as microfinance and inclusive lending programs have demonstrated their potential to empower vulnerable populations, particularly women, by providing them with the financial resources needed to engage in income-generating activities (Armendáriz & Morduch, 2010).

In Vietnam, the trajectory of poverty reduction over the past three decades represents a remarkable transformation. From being one of the poorest countries globally, Vietnam has transitioned to a lower-middle-income nation. The poverty rate, which stood at 58.1% in 1993, had fallen to just 4.8% by 2020 (World Bank, 2020). However, this progress conceals significant regional disparities. Ethnic minorities, accounting for approximately 15% of Vietnam's population, represent over half of the country's poor (World Bank, 2019). Among these, the Northern Midlands and Mountains region, home to diverse ethnic groups, remains one of the most impoverished areas due to geographical isolation, limited infrastructure, and socio-economic marginalization (Baulch, 2010). The Dao ethnic group, particularly Dao women, exemplifies the intersection of these challenges. As of 2022, approximately 35% of the population in the Northern Midlands and Mountains region lived below the multidimensional poverty line, with women disproportionately affected due to restricted access to education, healthcare, and economic opportunities (General Statistics Office of Vietnam, 2022). Despite their critical roles in household management and agricultural production, Dao women encounter considerable barriers to accessing financial resources that could improve their productivity and income (Bierkamp, Nguyen, & Grote, 2023). Microcredit programs, such as those offered by the Vietnam Bank for Social Policies (VBSP) and various non-governmental organizations, have been introduced as targeted interventions to address poverty in the region (Vietnam Bank for Social Policies (VBSP), 2020). Reports indicate that over 80% of ethnic minority households have accessed some form of credit to support livelihood development (Nguyen et al., 2023). While many households have successfully utilized loans to enhance their living standards, others have struggled with repayment due to financial illiteracy, unstable income sources, and reliance on subsistence farming (Vuong et al., 2020). A survey conducted in 2020 highlights this disparity in which only 27% of women borrowers in the region reported generating sufficient income to meet their debt obligations, while the majority faced repayment difficulties (World Bank, 2020).

The theoretical foundation for studying the relationship between debt and poverty reduction is multifaceted. Traditional economic theories posit that access to credit enables individuals and households to invest in productive activities, leading to income growth and improved living standards (Banerjee & Duflo, 2011). However, contemporary critiques emphasize the influence of social, cultural, and institutional factors in shaping the outcomes of debt (Goetz & Gupta, 1996). For ethnic minority women, these factors are deeply intertwined with entrenched gender norms, cultural practices, and power dynamics that often constrain their ability to fully benefit from financial services (Kabeer, 1999). Moreover, sustainable poverty reduction necessitates balancing short-term financial improvements with long-term social and economic resilience. For many ethnic minority communities, dependence on debt without adequate support mechanisms such as financial literacy programs, market access, and institutional safeguards risks perpetuating cycles of borrowing and dependency rather than fostering sustainable economic progress (Yunus, 2009).

Despite extensive research on debt and poverty alleviation, critical gaps persist. Studies often overlook the challenges of ethnic minorities in remote areas, focusing instead on urban populations (Bierkamp et al., 2023). While microcredit's role in women's empowerment is well-studied, its impact on the economic resilience of Vietnam's ethnic minority women remains underexplored (World Bank, 2019). Additionally, the sustainability of debt as a poverty reduction tool for these groups, amid regional disparities and systemic barriers, requires further investigation (Baulch, 2010). This study examines the role of debt in sustainable poverty reduction among Dao ethnic women in Vietnam's Northern Midlands and Mountains region. By analyzing their borrowing experiences and the socio-economic and structural challenges they face, the research aims to elucidate the relationship between debt and poverty reduction. While microcredit programs have shown potential in empowering marginalized groups, their effectiveness is shaped by cultural, institutional, and gender-specific factors (Armendáriz & Morduch, 2010; Kabeer, 1999). Structural barriers like limited financial literacy and market access further hinder sustainable poverty alleviation (Baulch, 2010; Bierkamp et al., 2023). The study contributes to theoretical and practical insights for fostering inclusive development (World Bank, 2022). The research is divided into introduction, conceptual framework and development of hypothesis; methodology, results and discussion and conclusion.

2. Conceptual Framework and Hypothesis Development

2.1. Debt Sustainability and Types of Debt

Debt sustainability, in the context of poverty reduction, refers to the capacity of individuals or communities to manage and repay debt in a way that supports long-term economic development without compromising their future financial stability. For Dao ethnic women in the Northern Midlands and Mountains region of Vietnam, debt sustainability is particularly crucial, as it enables them to improve their livelihoods while avoiding the trap of

perpetual indebtedness. Debt, when managed sustainably, can provide the necessary capital for engaging in income-generating activities, such as agricultural development or small-scale enterprises, leading to enhanced economic stability and poverty reduction (Armendáriz & Morduch, 2010; Kabeer, 1999).

In this case, debt sustainability is not only about the ability to service loans but also about ensuring that borrowing facilitates long-term socio-economic growth. For Dao women, the key factors include the productive utilization of loans, financial literacy, and the ability to maintain a balance between debt obligations and their household responsibilities (Bierkamp et al., 2023). Socio-cultural factors, such as gender norms and limited access to financial resources, also play a critical role in shaping their ability to sustainably manage debt (Baulch, 2010). Thus, debt sustainability for Dao women requires addressing these contextual challenges and providing adequate support mechanisms, such as financial education and access to markets. Debt can become a tool for empowerment, enabling them to break the cycle of poverty and achieve lasting economic improvements (World Bank, 2022).

2.1.1. Parental Debt

Parental debt refers to financial obligations incurred by individuals, particularly women, who borrow money or resources from their parents or other close family members to address immediate needs or economic challenges. In the context of Dao ethnic women in the Northern Midlands and Mountains region of Vietnam, parental debt is a significant phenomenon, largely driven by the limited access to formal financial institutions and the reliance on family support networks. Many Dao women borrow from their parents to cover basic household needs, such as medical expenses, wedding costs, or agricultural investments (Garfinkel, McLanahan, & Hanson, 1998). This form of debt often arises during times of economic instability, such as poor harvests, natural disasters, or personal crises (Arthur, 2018).

In rural areas where subsistence farming remains the primary livelihood, the ability to repay parental debt can be severely limited due to low and unpredictable incomes. A survey conducted by Baulch (2010) in Vietnam found that approximately 25% of rural households, including those of ethnic minorities like the Dao, rely on borrowing from family members to meet financial needs. For Dao women, this cycle of borrowing and repaying debt from parents can create a long-term financial burden, making it difficult for them to invest in education, healthcare, or business opportunities (Turetsky & Waller, 2020). Consequently, parental debt often results in a cyclical pattern of dependence, where women remain trapped in a cycle of borrowing without the means to build sustainable economic independence (Berger & Houle, 2016). This financial vulnerability not only hinders their capacity for poverty reduction but also limits their ability to achieve long-term economic stability (World Bank, 2019). Addressing parental debt, therefore, requires targeted support mechanisms such as financial literacy programs and access to credit that can reduce dependency on family borrowing (Kabeer, 1999).

2.1.2. Agricultural Debt

Agricultural debt refers to the financial obligations incurred by Dao ethnic women in the Northern Midlands and Mountains region of Vietnam to finance agricultural activities, such as crop production, livestock farming, and other farming-related investments. In rural areas, where agriculture is the primary livelihood, many women borrow money to purchase seeds, fertilizers, tools, and livestock to enhance productivity and income. However, the instability of agricultural income, often due to factors like weather variability, market fluctuations, and limited access to modern agricultural techniques, makes it difficult for women to repay these loans (Baulch, 2010). For Dao ethnic women, agricultural debt is a significant challenge due to limited financial literacy and restricted access to formal credit. Over 60% of Dao households in the Northern Midlands and Mountains region rely on loans, averaging 10-15 million VND (\$400-\$600), to fund farming (Tra Pham & Lensink, 2008). However, high-interest rates, inflexible terms, and risks like crop failure or price drops often lead to long-term indebtedness and deeper poverty (Nguyen et al., 2023). Agricultural debt often traps Dao women in a cycle of borrowing, limiting investment in education or healthcare. Addressing this requires improved financial literacy, affordable credit access, and resilient farming practices. Empowering women with sustainable farming skills and debt management resources can break this cycle and promote long-term economic stability (Baulch, 2010; World Bank, 2019).

2.1.3. Wedding Debt

Wedding debt refers to the financial obligations incurred by families, particularly Dao ethnic women, in the process of arranging and hosting a wedding. In many rural communities in the Northern Midlands and Mountains region of Vietnam, weddings are significant cultural events that involve substantial expenditures. These expenses often include the cost of the bride price, ceremonial items, feasts, and the preparation of the bride's dowry. For Dao ethnic women, wedding debt represents not only a personal financial burden but also a social and cultural obligation, as the expectations surrounding weddings can be deeply ingrained in the community's customs and values (Tien et al., 2024). Wedding debt among Dao is often incurred through borrowing from relatives, friends, or financial institutions to cover high wedding costs. For example, in the Northern Midlands and Mountains region, 25-30% of families take on wedding-related loans, averaging 10-20 million VND (\$400-\$800), which can take years to repay (Quisumbing et al., 2023). This debt places long-term financial strain on Dao women, limiting their ability to invest in education, healthcare, or business opportunities (Seewald, Oetjen, & Nguyen, 2025). The social pressure to host extravagant weddings in the Dao community often leads to unsustainable debt, trapping families in poverty. This cycle of borrowing to repay previous loans hinders women's ability to achieve financial independence. To address this, a comprehensive approach is needed, including financial education, support for sustainable income sources, and a shift in cultural values that prioritize long-term economic stability over costly weddings (Kabeer, 1999; World Bank, 2019).

2.2. Poverty Reduction

Poverty remains one of the most persistent and critical challenges facing humanity, continuing to undermine well-being, limit opportunities, and obstruct social progress. The fight against poverty is not only a moral imperative but also a vital component in the achievement of the Sustainable Development Goals (SDGs) by 2030 (Michael-

Onuoha, Nkiko, & Okuonghae, 2020). Poverty reduction refers to efforts aimed at diminishing the prevalence and depth of poverty within a population. It involves not only increasing income levels but also improving access to essential services such as education, healthcare, clean water, and sanitation (Nzasabayezu, Prakash, & Prasad, 2024).

In the context of Dao ethnic women in the Northern Midlands and Mountains region of Vietnam, poverty reduction is intricately linked to both economic and social factors, including access to financial resources, land, and social services. These women face multiple challenges that hinder their ability to escape poverty, such as limited educational opportunities, lack of access to credit, and gender-based discrimination in the labor market (Nweke, 2014). The rural nature of this region, where subsistence farming is prevalent, compounds the challenges of poverty reduction. Limited access to formal financial services and inadequate infrastructure often leave Dao women reliant on informal borrowing, including family loans or microcredit programs, which may not be sufficient to address their long-term needs (Miah, Lakner, & Fekete-Farkas, 2024). Poverty reduction for these women requires a multifaceted approach, which includes not only economic empowerment through access to capital and markets but also social empowerment, such as improving educational attainment, enhancing healthcare access, and promoting gender equality. Despite efforts by government and non-governmental organizations to address these issues, such as microfinance programs and vocational training initiatives, the impact on poverty reduction has been limited due to the structural barriers faced by these women (World Bank, 2022). Therefore, a more sustainable approach to poverty reduction should focus on creating systemic changes, including improving financial literacy, offering flexible loan terms, and fostering an inclusive economic environment that prioritizes the needs of marginalized communities (Iwuamadi, 2014).

2.3. Dao Ethnic Women in The Northern Midlands and Mountains Region of Vietnam

Dao ethnic women in the Northern Midlands and Mountains region of Vietnam face significant challenges in managing debt and escaping poverty. These regions, predominantly rural and economically underdeveloped, often have limited access to formal financial services. Consequently, many women are forced to rely on informal borrowing methods, including loans from family, friends, or microcredit schemes. According to the General Statistics Office (2022), nearly 25% of rural households in these areas depend on borrowing to meet basic needs, with a significant proportion of loans allocated to agricultural investments such as seeds, fertilizers, and machinery. These investments, while critical for subsistence farming, make households vulnerable to external factors like market fluctuations and climate change, exacerbating financial instability (General Statistics Office, 2022). From 2020 to 2024, the debt burden on ethnic minority households, particularly women-led ones, has increased due to rising input costs and unstable agricultural incomes. A report by the Vietnam Women's Union (2023) highlights that approximately 32% of women in rural and mountainous areas face challenges in repaying loans due to irregular income streams from farming (Vietnam Women's Union, 2023). This issue is compounded by traditional gender roles that limit women's participation in financial decision-making, leaving them with little control over household resources (World Bank, 2024).

Despite these challenges, targeted interventions have shown promise in alleviating poverty. Flexible loan programs with lower interest rates and adaptable repayment schedules, introduced between 2022 and 2024, have provided critical relief for many women. Additionally, initiatives to improve financial literacy, such as community-based training sessions, have started to empower Dao women to manage their debts more effectively. (World Bank, 2024). However, sustained efforts are needed to expand formal financial services in remote areas and address cultural norms that restrict women's economic agency. By addressing these systemic issues, the potential for debt to become a tool for sustainable poverty reduction can be fully realized, enabling Dao women to improve their socio-economic status.

2.4. Hypothesis Development

The relationship between debt and sustainable poverty reduction is complex and multifaceted, particularly for marginalized groups such as Dao ethnic women in the Northern Midlands and Mountains region of Vietnam. Debt can act as a catalyst for long-term socio-economic empowerment when managed strategically (Guérin, Morvant-Roux, & Illarreal, 2014). For Dao families, particularly those in remote areas, debt is frequently incurred to invest in education, vocational training, or entrepreneurial activities for their children (Hoang & Yeoh, 2015). These investments often target daughters, who play a crucial role in their families' economic activities and community development (Doanh, Nhuan Kien, Do, Thi Minh Hang, & Thi Thanh Huyen, 2015). By acquiring skills or knowledge through education funded by debt, Dao women gain opportunities to participate in higher-value economic activities, such as handicrafts, small-scale trade, or ecotourism (World Bank, 2019). These activities not only provide a stable income but also foster financial independence and confidence, breaking the cycle of intergenerational poverty (Hiep, Phuong, & Itani, 2022). Furthermore, the pressure to repay debt motivates families to innovate and diversify income sources, leading to more sustainable livelihoods (O'Connell, 2024). Women, as key contributors to household economies, often spearhead these initiatives, leveraging their unique knowledge of local resources and market dynamics (UN Women, 2020). Additionally, the presence of debt encourages greater financial discipline and planning among families, creating a ripple effect on community-wide economic behavior (Asian Development Bank, 2018). For Dao women, this disciplined environment enables them to develop resilience and adaptive skills, better equipping them to navigate economic challenges and opportunities (Nguyen et al., 2023). Therefore, while debt carries inherent risks, its strategic use can empower Dao ethnic women, fostering sustainable development and long-term poverty alleviation in their communities (Guérin et al., 2014). Based on these findings, the authors proposed the hypothesis.

H1: Parental debt significantly relates to sustainable poverty reduction of Dao ethnic women in the Northern Midlands and Mountains region of Vietnam.

In the Northern Midlands and Mountains region of Vietnam, where agriculture serves as the primary livelihood for the Dao ethnic community, agricultural debt can have a profound influence on sustainable poverty reduction for Dao women (Barungi, 2022). While debt is often perceived as a financial burden, when allocated toward productive agricultural investments, it can become a catalyst for long-term economic empowerment and poverty alleviation (World Bank, 2019). For Dao women, who are actively involved in agricultural work, these improvements translate into increased income-generating opportunities (UN Women, 2020). By adopting modern farming techniques or

engaging in value-added activities like food processing or eco-friendly farming, women can enhance their economic contributions and improve household living standards (Asian Development Bank, 2018). The empowerment of Dao women through agricultural productivity fosters community resilience (Kundu & Gupta, 2024). Increased household income reduces dependency on external aid, while women's enhanced roles contribute to stronger social networks and collective problem solving (De Schutter, Frazer, Guio, & Marlier, 2023). Over time, this creates a foundation for sustained poverty reduction, not just for individual families but for the entire community (Nguyen et al., 2023). Therefore, agricultural debt, when managed effectively, has the potential to drive sustainable economic and social transformation (Guérin et al., 2014). Based on these findings, the authors proposed the hypothesis.

H₁: Agricultural debt significantly relates to the sustainable poverty reduction of Dao ethnic women in the Northern Midlands and Mountains region of Vietnam.

In the cultural traditions of the Dao ethnic group in Vietnam's Northern Midlands and Mountains region, weddings are significant events that strengthen family bonds and social networks (Barungi, 2022). While wedding expenses often lead to debt, this financial obligation can paradoxically contribute to sustainable poverty reduction for Dao women when viewed through a broader socio-economic lens (Son, Kingsbury, & Hoa, 2021). Wedding debt frequently necessitates resource mobilization from families, encouraging them to tap into extended social networks (World Bank, 2020). Moreover, the financial pressure of wedding debt can act as a catalyst for households to adopt more disciplined financial management practices (Asian Development Bank, 2018). Families may diversify income sources, engage in small-scale entrepreneurship, or invest in sustainable livelihoods to meet repayment obligations (Kundu & Gupta, 2024). Dao women, traditionally involved in economic activities such as handicrafts, farming, or small trade, often play pivotal roles in these endeavors (UN Women, 2020). These efforts not only contribute to debt repayment but also improve the long-term financial stability of the household (Guérin et al., 2014). Thus, while wedding debt presents immediate financial challenges, it can also foster community solidarity, promote economic resilience, and empower Dao women in meaningful ways (Nguyen et al., 2023). Based on these findings, the authors proposed the hypothesis.

H₂: Wedding debt significantly relates to sustainable poverty reduction of Dao ethnic women in the Northern Midlands and Mountains region of Vietnam.

3. Methodology

3.1. Measurement of Constructs

This study employs a mixed research method to examine the relationships between poverty reduction, parental debt, agricultural debt, and wedding debt among Dao ethnic women in the Northern Midlands and Mountains region of Vietnam. A scale adapted from Mohammed, Hassan, and Zakari (2021) and Kabari and Nwogo (2021) to measure poverty reduction (PR) includes five items. A four-item measure of parental debt was developed by Berger and Houle (2016). For the Agricultural debt and Wedding debt scales, firstly, the authors conducted a qualitative research method to establish measurement scales for these variables through direct interviews with three experts on development economics in Vietnam. The opinions of experts are as follows.

Agricultural debt places significant financial pressure on farming households, with experts noting that it limits their ability to invest in productivity-enhancing technologies and resources. High levels of debt reduce farmers' capacity to improve their operations, leading to stagnation in productivity and increased vulnerability to economic and environmental shocks. Debt servicing often diverts resources away from long-term growth, preventing farmers from adopting modern farming practices and technologies that could improve efficiency and profitability.

Wedding debt, on the other hand, creates long-term financial stress for newlyweds by restricting their ability to save for important future goals, such as buying a home. Experts emphasize that societal pressure to have extravagant weddings often results in unnecessary debt, which negatively impacts a couple's financial stability. The repayment of this debt creates additional financial burdens that limit the couple's capacity to invest in their future and meet other essential financial needs. Both agricultural and wedding debt, therefore, hinder economic growth and long-term financial security.

Table 1. Measurement scales.

Variables/Code	Items
Poverty reduction	
PR1	The implementation of social protection programs effectively reduces poverty in the community.
PR2	Everyone has equal access to basic services, technology, and economic resources.
PR3	Resources are effectively mobilized to achieve the goal of eradicating poverty completely.
PR4	My community demonstrates strong resilience to environmental, economic, and social disasters.
PR5	The implementation of poverty eradication policy frameworks at all levels shows significant effectiveness.
Parental debt	
PD1	Households with high levels of credit and store card debt face significant financial stress.
PD2	Nonresident fathers' outstanding arrears contribute to economic challenges for their children.
PD3	Parental student loan debt or other bank/lender debt negatively impacts children's well-being.
PD4	The accumulation of parental debt, excluding mortgage and car loans, affects the household's financial stability.
Agricultural debt	
AD1	The accumulation of agricultural debt creates significant financial pressure on farming households.
AD2	High levels of debt related to farming operations negatively affect agricultural productivity.
AD3	Servicing agricultural debt reduces the capacity of farmers to invest in new technologies and resources.
Wedding debt	
WD1	Taking on debt to cover wedding expenses creates long-term financial stress for newlyweds.
WD2	Wedding-related debt limits a couple's ability to save for future goals, such as buying a home.
WD3	Repaying wedding debt affects the financial stability of the couple's household.
WD4	The pressure to have an extravagant wedding often leads to unnecessary debt.

Table 1 presents the scales developed through in-depth interviews with experts and the scales inherited from previous studies shown above.

Secondly, primary data were collected through structured questionnaires using a Likert scale to measure each construct. The target respondents included individuals from diverse socio-economic backgrounds to ensure a representative sample. The measurement items under all the constructs were responded to on a Likert scale of 1-Strongly Disagree, 2-Disagree, 3-Neutral, 4-Agree, and 5-Strongly Agree. The item scales were utilized to measure the theoretical constructs of the conceptual model.

3.2. Sampling and Data Collection

The study employed a mixed-method approach, in which quantitative data collection techniques focused on Dao ethnic women residing in the Northern Midlands and Mountains region of Vietnam. A stratified random sampling method was applied to ensure diverse representation across different age groups, education levels, and income brackets. A total of 206 respondents participated in the quantitative survey. The structured questionnaire covered various aspects, including demographics (age, birth order, education level, marital status, and monthly income). Data were collected through face-to-face surveys conducted by trained enumerators who were familiar with the local language and culture.

Quantitative data collected from the surveys were analyzed using SPSS 27 software, enabling statistical analysis and generating valuable insights into debt patterns and poverty reduction strategies. Ethical considerations were prioritized, including informed consent, confidentiality, and voluntary participation, ensuring participants' rights and data privacy throughout the research process. Information about the respondents' demographics is presented in Table 2.

4. Results and Discussion

4.1. Descriptive Statistics Result

The survey results reveal significant insights into the debt situation and its impact on sustainable poverty reduction among Dao ethnic women in the Northern Midlands and Mountains region of Vietnam. The majority of respondents are quite young, with 62.1% under 18 years old and 22.3% between 18-20 years old, indicating that debt and poverty issues could have long-lasting effects on the younger generation. The educational background of respondents is predominantly low, with 47.6% having only a primary school education and 22.8% having no formal education. Limited education often correlates with fewer job opportunities and lower income, contributing to a cycle of poverty and increased vulnerability to debt. The marital status data shows that 67.9% of respondents are married, suggesting that financial burdens associated with family responsibilities may contribute to their debt. Additionally, a significant percentage (64.1%) are the firstborn in their families, potentially bearing additional responsibilities, including repaying parental debts. Income analysis indicates that 70.9% of respondents earn between 2-5 million VND per month, while 17% earn less than 1 million VND. The low income, combined with a high debt prevalence (more than 80% of respondents), suggests financial instability and challenges in achieving sustainable poverty reduction.

Table 2. Demographics of respondents.

Demographics		Frequency	Percent
Age	Below 18	128	62.1
	18 - 20	46	22.3
	20 - 25	23	11.2
	Above 25	9	4.4
Birth order in the family	Firstborn	132	64.1
	Second-born	69	33.5
	Only child	5	2.4
Education level	No formal education	47	22.8
	Primary school	98	47.6
	Secondary school	14	6.8
	High school	6	2.9
	Vocational training	41	19.9
Marital status	Single	66	32.1
	Married	140	67.9
Monthly income	less than 1 million	35	17.0
	2 - 5 million	146	70.9
	5 - 10 million	22	10.7
	above 10 million	3	1.4
Total		206	100

4.2. Reliability and EFA Analysis

A reliability test using Cronbach's Alpha was conducted to assess the consistency of the research variables, which are presented in Table 3. According to Nunnally (1978), a good scale should have a Cronbach's Alpha reliability of 0.7 or higher. Hair Jr, Black, Babin, and Anderson (2009) also stated that a unidimensional and reliable scale should meet the Cronbach's Alpha threshold of 0.7 or above. Based on this, it is evident that all Cronbach's Alpha values in the study meet the criteria for being either preferable or acceptable.

Table 3. Cronbach's reliability tests.

Variables	Cronbach's alpha	N of items
PR	0.921	5
PD	0.896	4
AD	0.795	3
WD	0.929	4

The Exploratory Factor Analysis (EFA) results for the dependent variable Poverty Reduction (PR) indicate that the dataset is suitable for factor extraction. The Kaiser-Meyer-Olkin (KMO) value of 0.887 demonstrates sampling adequacy, confirming that the data are well-suited for factor analysis. Additionally, Bartlett's Test of Sphericity (Sig. < 0.001) and Total Variance Explained = 76.001% indicate significant correlations among the observed variables.

Table 4. Exploratory factor analysis EFA for independent variables.

Items	Wedding debt (WD)	Agricultural debt (PD)	Parental debt (AD)
WD2	0.916		
WD4	0.885		
WD1	0.877		
WD3	0.840		
PD2		0.886	
PD4		0.835	
PD3		0.779	
PD1		0.772	
AD3			0.894
AD2			0.787
AD1			0.685
KMO = 0.823; Sig of Bartlett's test = 0.001; Eigenvalues = 1.128; Total variance explained = 78.276%			

After that, EFA was conducted on the three independent factors: Parental debt (PD), Agricultural debt (AD), and Wedding debt (WD), using principal components extraction with varimax rotation. **Table 4** shows the EFA results for independent variables. The items loaded onto their designated constructs with significant factor loadings of 0.50 and above. The KMO index is 0.823, and Bartlett's test is statistically significant at a level of 0.001. The Eigenvalue is 1.128 (> 1), and the Total Variance Explained is 78.276%, which indicates the suitability of the EFA model.

4.3. Regression Analysis and Hypothesis Conclusion

The correlation analysis reveals significant relationships between poverty reduction (PR) and various types of debt among Dao ethnic women in the Northern Midlands and Mountains region of Vietnam. Parental debt (PD) shows a strong positive correlation with PR ($r = 0.645$, $p < 0.001$), indicating that managing parental debt plays an important role in poverty alleviation. Agricultural debt (AD) exhibits the strongest correlation ($r = 0.666$, $p < 0.001$), highlighting the critical impact of agricultural debt on poverty reduction, likely due to the community's dependence on agriculture for income. Wedding debt (WD) also shows a moderate positive correlation with PR ($r = 0.346$, $p < 0.001$), suggesting that financial pressures from cultural practices related to marriage can influence poverty outcomes.

After that, the authors conducted multiple linear regression analysis. The multiple regression analysis reveals significant insights into the impact of different types of debt on poverty reduction (PR) among Dao ethnic women in the Northern Midlands and Mountains region of Vietnam. **Table 5** presents the results of the multiple linear regression analysis and hypothesis conclusion. The model's Adjusted R Square of 0.552 indicates that 55.2% of the variance in poverty reduction is explained by the independent variables: Parental Debt (PD), Agricultural Debt (AD), and Wedding Debt (WD). The Durbin-Watson statistic of 2.066 suggests no significant autocorrelation in the residuals, supporting the model's robustness. Among the variables, Agricultural Debt (AD) shows the strongest positive effect ($\beta = 0.447$, Sig. = 0.001), highlighting how agricultural investments contribute substantially to sustainable poverty alleviation. Parental Debt (PD) also has a positive and significant impact ($\beta = 0.393$, Sig. = 0.001), indicating that supporting parents through debt can enhance household stability and reduce poverty. However, Wedding Debt (WD) demonstrates a negligible and statistically insignificant effect ($\beta = 0.020$, Sig. = 0.703), suggesting that debt incurred for wedding expenses does not contribute meaningfully to poverty reduction. The Variance Inflation Factor (VIF) values for PD, AD, and WD are 1.678, 1.418, and 1.308, respectively, indicating no multicollinearity issues.

Table 5. Regression analysis results and hypothesis conclusion.

Variables	Model	Hypothesis	Decision
	B (Standardized)		
PD	0.393***	H1	Accepted
AD	0.447***	H2	Accepted
WD	0.020	H3	Rejected
Durbin-Watson = 2.066			
Adjusted R square = 0.552			

Note: Dependent variable: PR; *** p < 0.001.

The results indicate a strong positive relationship between parental debt and PR, suggesting that borrowing to support parental needs contributes positively to household stability and poverty reduction. This type of debt likely helps Dao ethnic women manage financial pressures by ensuring that essential healthcare and support for elderly family members do not deplete household resources. The regression analysis further confirms that parental debt is a significant predictor of poverty reduction, supporting the acceptance of H1. This finding underscores the potential of parental debt as a strategic financial tool that, when managed well, can enhance economic resilience and long-term stability.

Among the three types of debt, agricultural debt emerges as the most impactful factor in sustainable poverty reduction. The correlation analysis suggests a strong connection between taking on agricultural debt and achieving economic improvement. Many Dao ethnic women likely utilize agricultural loans to invest in productive activities, such as purchasing seeds, livestock, or equipment, which generate consistent income and improve living standards.

The regression analysis also supports this relationship, highlighting agricultural debt as a critical driver of economic progress. The acceptance of H2 reinforces the idea that productive investments through debt can be highly effective in lifting households out of poverty. These findings suggest that development initiatives should focus on expanding access to agricultural credit and training in effective farm management to maximize poverty alleviation efforts. In contrast, wedding debt shows neither a significant correlation with PR nor a meaningful impact in the regression analysis, leading to the rejection of H3. This implies that wedding-related borrowing, often for non-productive and ceremonial purposes, does not contribute to poverty reduction. Instead, it may place an additional financial burden on families, hindering their ability to improve their economic situation. This result highlights the importance of promoting financial literacy and advising Dao ethnic women against accumulating debt for non-essential expenses. Additionally, cultural shifts toward more modest wedding practices could help reduce unnecessary financial strain and support sustainable poverty reduction strategies.

Parental and agricultural debts are valuable tools for enhancing economic stability and promoting long-term poverty alleviation, while wedding debt may have adverse effects. These insights emphasize the need for targeted support and education, helping Dao ethnic women make informed borrowing decisions and prioritize debt that contributes to productive and sustainable outcomes.

5. Implications and Conclusions

This study enhances the theoretical understanding of how different types of debt impact sustainable poverty reduction among Dao ethnic women in Vietnam's Northern Midlands and Mountains region. Firstly, the findings align with the Resource-Based View (RBV) theory, showing that Agricultural Debt (AD) used for productive investments can boost household capabilities and economic resilience, reinforcing the importance of income-generating activities in poverty alleviation. Secondly, the strong positive effect of Parental Debt (PD) supports microfinance and poverty alleviation theories, suggesting that debt aimed at family stability (e.g., healthcare and elder support) can indirectly reduce poverty. However, the insignificant impact of Wedding Debt (WD) challenges the consumption smoothing theory, highlighting that non-productive debt for ceremonial expenses may not aid poverty alleviation and could increase financial risks.

Financial institutions, policymakers, and community development organizations can leverage these insights to enhance poverty reduction efforts among Dao ethnic women in Vietnam's Northern Midlands and Mountains region. Prioritizing tailored loan products that support income-generating activities such as farming, livestock, and small-scale agricultural enterprises can amplify the positive effects of Agricultural Debt (AD) on poverty reduction. Offering low-interest loans, flexible repayment options, and financial literacy training could further empower ethnic women to maximize the benefits of productive debt. Similarly, local governments and NGOs could introduce microfinance programs or social funds focused on healthcare, elder care, and family stability initiatives, given the positive impact of Parental Debt (PD). These initiatives can alleviate household financial burdens and promote long-term economic stability. On the other hand, the insignificant effect of Wedding Debt (WD) underscores the need for awareness campaigns to discourage non-productive borrowing, particularly for traditional ceremonies. Engaging local leaders and community influencers could help promote financial prudence and encourage saving practices for life events instead of incurring debt.

This study, while providing valuable insights into the relationship between different types of debt and sustainable poverty reduction among Dao ethnic women in Vietnam's Northern Midlands and Mountains region, has certain limitations. The cross-sectional design restricts causal inferences, suggesting that future research could adopt a longitudinal approach to better capture the dynamic impact of debt on economic stability over time. Additionally, focusing exclusively on Dao ethnic women may limit the generalizability of the findings to other ethnic groups or broader rural communities. Expanding the research scope to include diverse populations could offer a more comprehensive understanding of debt's role in poverty alleviation across different cultural and socio-economic contexts. Furthermore, while the study categorizes debt into Parental Debt (PD), Agricultural Debt (AD), and Wedding Debt (WD), it does not explore the underlying factors driving borrowing decisions, such as cultural practices, financial literacy, or access to credit sources. Future studies could incorporate qualitative methods, such as interviews and focus groups, to gain deeper insights into these aspects. Moreover, external influences like policy changes, market fluctuations, and natural disasters were not considered, but could significantly affect household economic stability. Including these variables in future research could enhance the robustness of the findings and provide a richer understanding of the complex interplay between debt and poverty reduction. Addressing these limitations could contribute to more effective strategies for leveraging debt as a sustainable tool for poverty alleviation, benefiting not only Dao ethnic women but also other vulnerable groups in similar socio-economic environments.

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