

Exploring Decision-Making Power in VWB Beneficiaries in Bangladesh: Formulating A System Dynamics Model for VWB Programme

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Abstract

The Vulnerable Women Benefit (VWB) Programme in Bangladesh, previously known as the Vulnerable Group Development (VGD) Programme, provides 30 kgs of rice monthly and training sessions for two years to alleviate poverty and empower women. This study aims to assess the effectiveness of the VWB Programme in enhancing decision-making power among beneficiaries using a mixed-method approach. Structured questionnaires (n=274) and interviews (n=20) were administered to participants from Narayanganj and Chattogram during the 2023-2024 and 2021-2022 VWB cycles. Statistical tests, including t-tests and chi-square tests, compared decision-making capacities before and after participation in the Programme. Results indicated significant improvements in decision-making scores where the mean decision-making scores increased from 1.92 before joining to 3.49 after completing the VWB Programme. Chi-square tests have found positive associations between decision-making and different variables within programme participation. It also included a system dynamics model and its simulation for better understanding and comparison. Key factors influencing decision-making included access to education, family support, and income-generating activities, while cultural norms and gender-based discrimination remained the pressing challenges. The VWB Programme

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significantly enhances women's decision-making power, promoting socio-economic empowerment and gender equality, necessitating continued support and targeted interventions.

Keywords: VWB Programme, women's empowerment, decision-making, poverty alleviation, socio-economic development, Bangladesh.

1. Introduction

Women empowerment has become a global focus transcending borders for holistic development of a country with the realization that development is impossible if half of the population is left behind. In developing countries like Bangladesh, women's empowerment is especially important. Bangladesh has more women than men, making it more obvious that their empowerment and involvement in income-generating activities are crucial for reducing poverty, improving health, and fostering social equity. The Government of Bangladesh has taken several initiatives for promoting women empowerment. One such initiative is the Vulnerable Women Benefit (VWB) Programme, previously known as the Vulnerable Group Development (VGD) Programme. Under the programme, a woman beneficiary is given 30 kgs of rice monthly and provided training sessions for two years. By 2030, the government wants to provide VWB support to 3.2 million vulnerable women that will ensure their food security and offer training sessions designed to increase their employability.

The VWB Programme, operated under the Department of Women Affairs, partnered with the World Food Programme (WFP), aims to support vulnerable women across Bangladesh by providing them food assistance along with training sessions to enhance their awareness and skills (Bangladesh Food Planning and Monitoring Unit, 2023). This paper assesses the effectiveness of the programme in enhancing the decision-making power of the beneficiaries particularly in the key household decisions. The findings from the study are expected to provide insights regarding the effectiveness of the Programme in empowering women and assist the policy makers to take necessary initiatives to further redesign the programme for better serving the people facing significant hardships as well as empower them to ensure their sustained wellbeing.

1.1 Background of the Study

Poverty alleviation stands as a central goal within the national agenda of Bangladesh, with the Perspective Plan (2021-2041), aiming to eradicate extreme poverty and minimize overall poverty rates by 2041 (Bangladesh Food Planning and Monitoring Unit, 2023). As part of this overarching objective, social safety net programmes have emerged as a prioritized intervention by the government.

Women, particularly those experiencing multiple vulnerabilities, are identified as being disproportionately affected by poverty and are thus a key focus of such initiatives (World Food Programme, 2023). Since the 1971 liberation war in Bangladesh, the country has faced numerous challenges, including famine and poverty. Under the circumstances, the government introduced the Vulnerable Group Feeding (VGF) Programme in 1974, which later evolved into the Vulnerable Group Development (VGD) Programme and was further rebranded as the Vulnerable Women Benefit (VWB) Programme in 2022. Partnered with the World Food Programme (WFP), the VWB is a flagship Programme of the Department of Women Affairs of the Government under which the vulnerable women get monthly rice of 30 kg over two years (a VWB cycle) along with training sessions provided through selected NGOs to improve their awareness and skills (Bangladesh Food Planning and Monitoring Unit, 2023).

1.2 Statement of the Problem

The Vulnerable Women Benefit (VWB) Programme, previously known as the VGD Programme, holds a significant position in Bangladesh's safety nets landscape. Even though research on the programme's effects, inclusivity, and distribution have been explored, there is a lacuna in understanding the VWB Programme's effectiveness on enhancing the beneficiaries' decision-making abilities from the field level analysis. To determine how well the programme empowers women, it is essential to evaluate the decision-making procedures and power dynamics of the beneficiaries in their household matters. This study specifically focuses on this aspect of the VWB Programme to investigate the decision-making power among the recipients.

1.3 Literature Review

International evidence from women-focused safety net initiatives providing food aid and cash benefits similar to Bangladesh's VWB Programme has revealed that these programmes increase women's food security and economic empowerment. For instance, Jones et al. (2010) in their study of Ethiopia's Productive Safety Net Programme (PSNP) noted that PSNP increased beneficiaries' food security. The Self-Employed Women's Association (SEWA) of India reported the members' greater control over household finances and mobility (Chen et al., 2005). Pakistan's Benazir Income Support Programme (BISP) showed significant reductions in food insecurity as well (Ambler & De Brauw, 2019).

In Bangladesh, the VGD and VWB Programmes have been extensively studied, revealing both advantages and areas for improvement. According to the previous studies, the VGD Programme improves the participants' well-being, promotes economic activity, and guarantees food security. For instance,

Pradhan and Sulaiman (2014) pointed out that the VGD Programme provides food and improves the financial conditions of the beneficiaries, manifesting its effective role in reducing poverty. Afrad et al. (2012) found that VGD has improved the beneficiaries' well-being through increased meal frequency and per capita expenditure, which also stimulated local market growth, thereby suggesting broader economic benefits similar to the study of Pradhan and Sulaiman (2014). Again, demonstrated that the VGD Programme positively impacts women's household consumption diversity, highlighting significant improvements in their well-being during the Programme cycle.

The programme has increased women's economic empowerment along with their inclusion in the social spheres. However, the appropriate design of the programme and training have been emphasized in its success. Besides, increased programme coverage with longer duration was emphasized by Pradhan and Sulaiman (2014). Against this backdrop, monitoring and evaluation are required for sustaining these benefits. Also, without continued support for long term well-being and appropriate trainings, the effects of the programmes like VGD remains ambiguous. Notwithstanding the programme's achievements, problems including steady income sources and long-term financial security of the beneficiaries were not adequately addressed (Afrad et al., 2012). Therefore, maintaining these advantages once a cycle is finished is uncertain. This finding aligns with the study of Matin and Hulme (2003), who revealed that although VGD helps in immediate food security, long-term advantages are less certain in the absence of continuous assistance.

Building on lessons from previous studies and their impacts on beneficiaries, this research focuses on the decision-making power of VWB beneficiaries, an area that remains unexplored in Bangladesh. The comprehensive strategy of the VGD Programme, which combines development training with food aid, has been effective in meeting short-term needs but less successful in promoting sustained economic independence. While beneficiaries receive immediate benefits through VWB, evidence suggests that transitioning to long-term economic stability and autonomy is less certain, as revealed in the existing literature. This study focuses on this gap intending to explore the long-term effects of the VWB Programme on women's decision-making power, its improvement, and its stability after finishing the cycle.

1.4 Rationale of the Study

Women empowerment, more specifically the involvement of women in the decision-making processes, is crucial for social development. They have an equal stake in society as men. However, women face multifaceted challenges in accessing resources and making decisions in the social domain. The VWB Programme is an

avenue for addressing those challenges with financial support and training. The research aims to explore the effectiveness of the VWB Programme on the decision-making power of the beneficiary women. It intends to contribute with valuable insights to the field of women empowerment and the effectiveness of the poverty alleviation strategies like the VWB Programme in doing so.

The scope of the study is to investigate the decision-making power among the beneficiary women after finishing a VWB cycle. Previous studies on women's decision-making processes have established some themes and indicators (Kabeer, 1999; Malhotra et al., 2002), but these indicators have not been used to rationalize the VWB Programme's women empowerment activities. In this connection, this study seeks to identify the empowerment outcomes of the VWB Programme through assessing its role in enhancing women's decision-making power.

1.5 Research Hypothesis

The VWB Programme intends to empower women through food assistance and training programmes. The existing literature reinforce the claims. Based on the aims of the VWB Programme and the previous literature, the research proceeds with the following hypotheses:

1. Alternative Hypothesis (H1): The VWB Programme significantly enhances decision-making power among women.
2. Null Hypothesis (H0): The VWB Programme does not significantly enhance decision-making power among women.

1.6 Research Objectives

The objectives of the research are:

1. To assess the current level of decision-making power among beneficiary women in the VWB Programme.
2. To identify the factors influencing decision-making power among beneficiary women.
3. To evaluate the impact of the VWB Programme on enhancing decision-making power among beneficiary women.
4. To explore the challenges and opportunities faced by beneficiary women in exercising their decision-making power.
5. To identify the ways of designing empowerment-focused Social Safety Net programmes similar to VWB.

2. Methodology

2.1 Research Design

The study employed both quantitative and qualitative methods. Quantitative

data were collected using a structured questionnaire, while qualitative data were obtained through in-depth interviews to capture the underlying reasons behind the respondents' choices.

2.2 Data Collection Tools

A structured questionnaire, which was informed by existing literature on women's decision-making processes and empowerment, was designed to evaluate decision-making power, participation in the VWB Programme, socio-economic status, and awareness levels. The questionnaire was translated into Bengali to ensure comprehensibility for all beneficiaries. Google Forms was used to facilitate digital collection at the field level. Moreover, the qualitative data were used to reinforce the findings of the survey.

2.3 Sample Design

The respondents comprised women beneficiaries of the VWB Programme in Narayanganj Sadar Upazilla, Narayanganj and Karnaphuli Upazilla, Chattogram. For the survey, a total of 274 respondents participated in the study, divided into two groups: 191 participants from Narayanganj and another 83 participants from Chattogram. Additionally, 20 respondents among the survey participants were interviewed (10 from each district).

2.4 Sampling Technique

The sample was selected through a purposive sampling method targeting women who were the beneficiaries of the VWB Programme during the 2021-2022 and 2023-2024 cycles. The participants were guaranteed to have firsthand knowledge of the Programme and be able to offer pertinent insights on how it affected their ability to make decisions. The distribution of the respondents and the sampling technique are portrayed in Table 1.

Study Area	VWB Cycles	Number of Respondents Surveyed	Number of Interviewees	Sampling Method
Narayanganj	2023-2024	96	10	Purposive Sampling Technique
	2021-2022	95		
Chattogram	2023-2024	40	10	
	2021-2022	43		
Total		274	20	

Table 1: Distribution of the Respondents and Sampling Technique

2.5 Secondary Data Sources

Secondary data were assembled from the existing literature including research articles, newspaper reports, various reports of the government and NGOs, policies and Acts that are complementary to the research objectives. Key references included the study of Kabeer (1999), Malhotra et al. (2002), and the Women's Empowerment in Agriculture Index (WEAI) that have been used to establish the conceptual framework.

2.6 Data Analysis Tools

Quantitative data were analyzed using descriptive statistical techniques, including percentages, means, modes, standard deviations, and standard errors. T-tests were conducted to compare the decision-making and confidence scores before and after the VWB Programme. Chi-square tests were conducted for the yes-no questions and to determine the relationships between different variables. SPSS (Version 27) and Microsoft Excel were used for the statistical analysis and presentation of the data. Qualitative data were analyzed using thematic analysis to identify patterns and themes in the responses. The analysis involved coding of the data, identification of the themes, and interpretation of the findings in relation to the research objectives.

2.7 Validity and Reliability Analysis

The validity of the research findings was ensured by carefully designing the questionnaire based on established frameworks and literature. For this study, the researchers focused on content validity and construct validity. Content Validity ensures the questionnaire comprehensively covers the topic it aims to measure. For ensuring this, the questionnaire was subjected to expert review. Experts in the fields of women empowerment and social safety net programmes reviewed it. Their feedback ensured that every essential facet of empowerment and decision-making authority was addressed through it. Construct validity quantifies how well the items on the questionnaire correspond to the theoretical constructs that they are meant to assess. The questions were grouped together using factor analysis to see if they aligned with the theoretical conceptions of empowerment and decision-making power.

2.8 System Dynamics Model, Simulation, and Causal Loop Diagram (CLD)

The System Dynamics Model (SDM) developed in the study aims to simulate the complex and dynamic interactions among key variables within the VWB Programme that influence women's decision-making power. The model incorporates both "reinforcing" and "balancing" feedback loops to capture the interdependencies between training, economic stability, confidence, family

support, cultural norms, and decision-making power. The model was simulated over a 24-month period to visualize how these factors evolve over time, allowing for a deeper understanding of how the programme's interventions contribute to empowerment. The "Causal Loop Diagram (CLD)" provides a visual representation of the feedback, illustrating the influence of variables like training and family support, as well as highlighting cultural constraints as a balancing force that limits progress. The simulation and CLD together offer valuable insights into the pathways through which empowerment occurs, as well as the barriers that need to be addressed for sustained impact of the Programmes like VWB.

2.9 Ethical Considerations

To ensure the ethical rigor of the research, informed consent was obtained from the participants before conducting the survey and interviews. They were informed of the research objectives. Anonymity of the participants has been strictly maintained while presenting the data throughout the research.

3. Conceptual Framework

The conceptual framework is developed to understand and evaluate the impact of the VWB Programme on the beneficiaries' decision-making power in Bangladesh. The works of Kabeer (1999) and Malhotra et al. (2002) have identified several elements influencing the empowerment of women. For instance, Malhotra et al. (2002) have identified that the common elements influencing women empowerment are income, education, family support, access to resources, participation in household decisions, personal autonomy, and community participation. Similarly, Kabeer (1999) pointed out three broad dimensions to understand women empowerment, such as resources, agency, and achievements. Under these dimensions, he reiterated that making household decisions, access to resources, education, income, decisions regarding family planning, household purchases, healthcare, employment, information access, personal autonomy, and freedom of movement strengthen women's status in the family and society, facilitating their empowerment (Kabeer, 1999). Besides, cultural norms, resource constraints, and gender-based discrimination limit such empowerment (Kabeer, 1999; Malhotra et al., 2002).

Based on these elements, the conceptual framework has been prepared (Figure 1) to understand the factors that influence women's empowerment and decision-making processes within the context of VWB Programme. The framework has put the elements under the individual and contextual factors that influence the beneficiaries' decision-making powers, coupled with the programme

interventions. The challenges and barriers negatively impact women's decision-making powers even after the programme interventions.

3.1 Key Components of the Conceptual Framework:

3.1.1 Individual Factors:

Education Level: The level of formal and informal education received by the participants.

Income-Generating Activities: Involvement in activities that provide financial benefits.

Personal Autonomy: Authority to make decisions regarding individual and family issues.

3.1.2 Contextual Factors:

Cultural Norms: Social expectations and cultural norms influencing decision-making power.

Family Support: Level of support received from family members.

Access to Resources: Ownership and access to financial resources and involvement in the community networks.

3.1.3 Programme Interventions:

Training Sessions: Training sessions covered within the VWB cycles.

Material Support: Rice and other support provided to the beneficiaries.

3.1.4 Outcomes:

Enhanced Decision-Making Power: Enhanced confidence and ability to make decisions regarding personal and family matters.

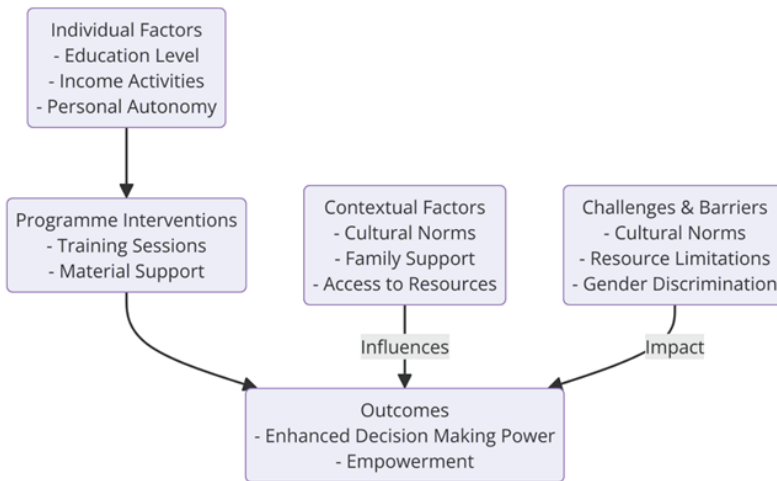
Empowerment: Improvement in the personal autonomy and socio-economic status.

3.1.5: Challenges and Barriers:

Cultural Norms: Persistent cultural barriers, i.e., social and cultural expectations restricting women's decision-making power.

Resource Limitations: Lack of access to resources.

Gender Discrimination: Discrimination based on gender that limits the exercise of women's decision-making power.



The relationship between the factors is shown in Figure 1.

Figure : Conceptual Framework

The conceptual framework shows how the individual and the contextual factors influence the beneficiaries' decision-making power, coupled with the programme interventions. It also shows the impact of cultural norms, resource limitations, and gender-based discrimination on limiting the VWB outcomes. The result and discussion section unpacks the findings based on the factors and examines how the factors work in the context of the VWB Programme that further facilitates the development of the System Dynamics Model (SDM).

4.Results and Discussion

4.1 Demographic Data of the VWB Beneficiaries

Figure 1 portrays the demographic information of the respondents. It shows that the majority of the respondents were aged between 36-45 (42.7%), married (83.2%), and had primary (35.7%) and secondary education (36.5%). Most of them had 1 or 2 children (53.6%). Additionally, 38.7% of respondents reported feeling "somewhat confident" in their ability to read and understand written information, while only 32.8% had access to educational opportunities outside formal schooling, contributing to their decision-making abilities. These foundational characteristics set the stage for understanding how these women perceive and exercise their decision-making power. The demographic information of the respondents is shown in Figure 2.

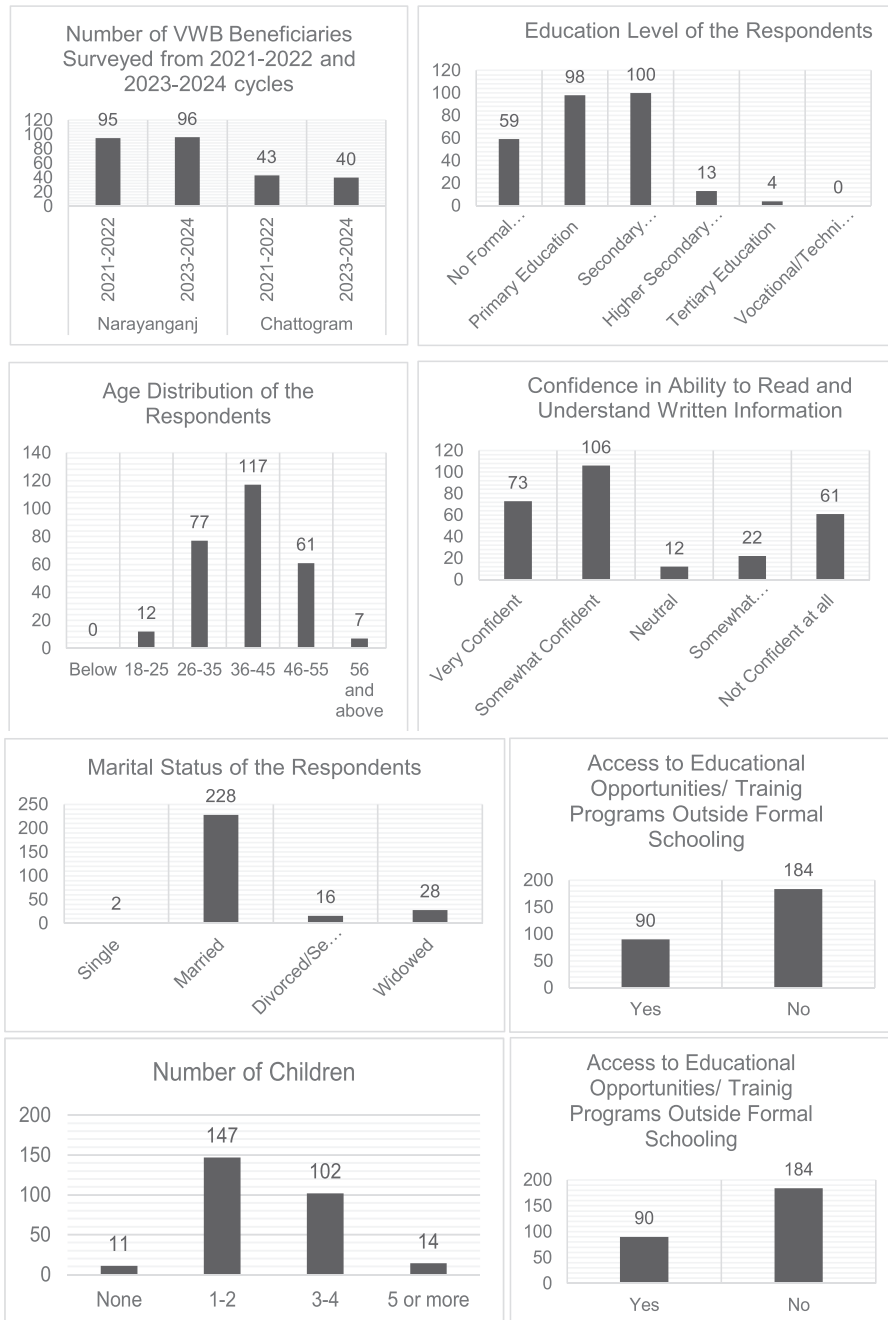


Figure 2: Demographic Information of the Respondents

4.2 Assessing the Current level of decision-making power among VWB beneficiaries.

The assessment of decision-making capacity and influencing factors among the VWB beneficiaries demonstrated that women significantly benefited from the VWB Programme. The findings have revealed that before participating in the VWB Programme, many respondents reported low levels of confidence and limited involvement in household decision-making. For instance, only 12.7% felt “very comfortable” in expressing their opinions in family discussions (Figure 5). After the Programme (Figure 3), 45.6% of the respondents indicated they “always” made decisions regarding household expenses, and 40.9% reported participating “daily” in discussions about major household purchases. This increase in involvement suggests that the VWB Programme effectively empowers women to take active roles in managing household finances and making significant household decisions. Key factors contributing to this empowerment included enhanced educational opportunities, strong family support (22.6% reported so), and involvement in income-generating activities (47.4%) that are shown in Figure 4. The findings portraying the current level of decision-making power among the VWB beneficiaries are shown in Figure 3.

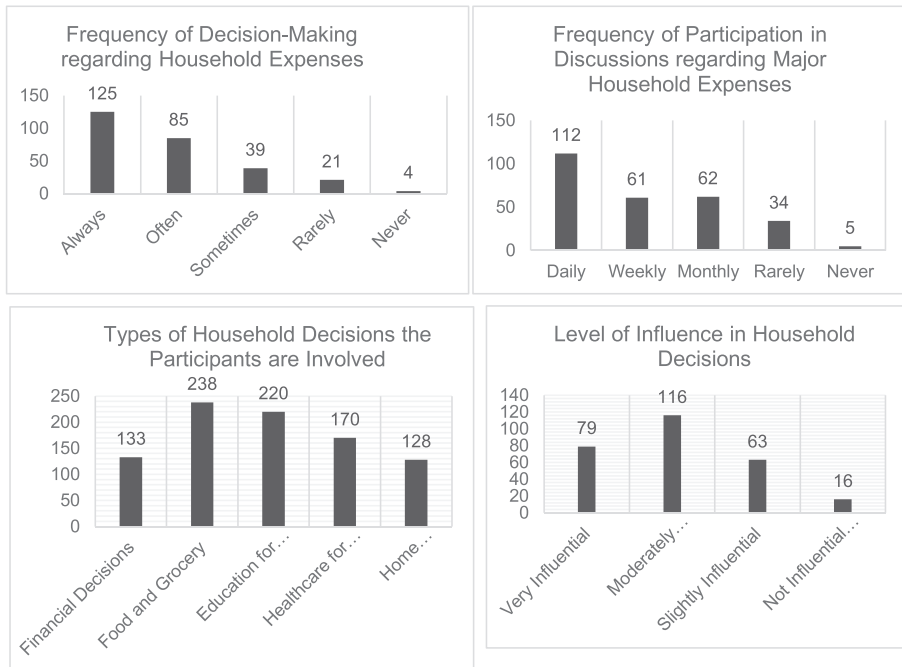




Figure 3: Current Level Decision-Making Power among VWB Beneficiaries
Findings have revealed that women mainly dealt with the decisions regarding food, grocery, education for the children, and about family healthcare with limited autonomy in financial decisions. 24.8% of them was primary decision

makers in major household purchases (51.8% made the decisions jointly with their husband). Again, 25.5% was the primary decision makers for major personal and family matters (52.9% made the decisions with their husband) indicating their significant influence in the family decisions. The findings are validated by their authority to make decisions regarding own healthcare (78.8%) and family planning (77.3%) independently. Moreover, majority of them were “very comfortable” (35%) and “somewhat comfortable” (49.2%) in expressing their opinions in family issues that manifest their autonomy in their family. The reasons for their increased decision-making might result from their access to financial resources, almost 50% had access to resources, and minimal external factors influencing household decisions.

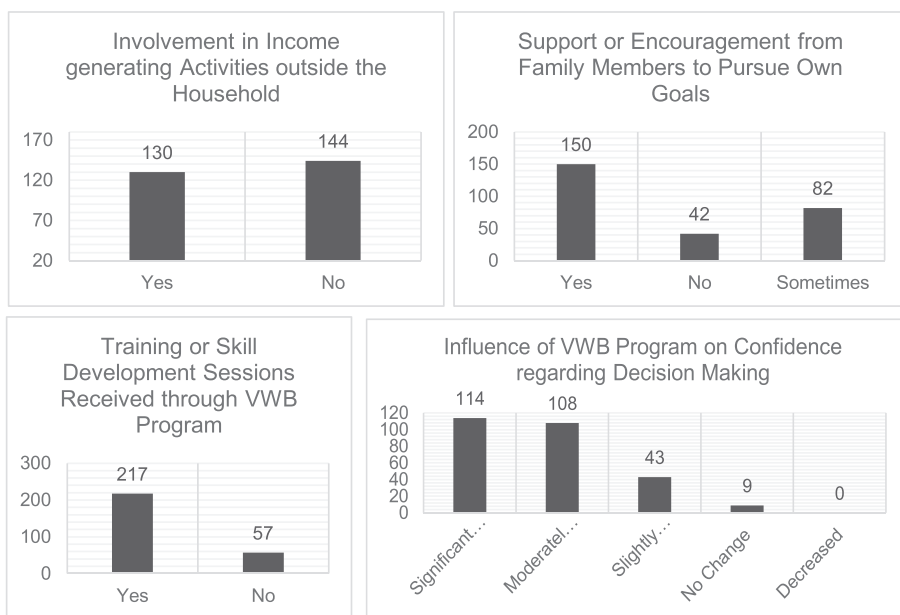
4.3 Influencing Factors in Decision-making among VWB Beneficiaries

This section highlights various factors influencing decision-making power among the beneficiaries. Access to education and family support emerged as critical enablers, so did the support/advice from family members and friends. 54.7% respondents received support and encouragement from the family to pursue their own goals i.e., earning to become self-reliant. Additionally, a significant number of them received support/advice from their family/friends (daily support received by 22.6%, and weekly by 25.5%). These assistances resulted in the involvement of 47.4% of women in income-generating activities outside the household, which significantly contributed to their decision-making abilities. 46.3% of respondents have financial resources for independent decision-making in the household as well as regarding their own goals. Besides, almost 80% of beneficiaries received training from the programme that has further increased their decision-making capacity. It is observed that, VWB Programme has influenced the confidence in decision-making power of the beneficiaries as it showed increase among 80% of respondents (41.6% significantly increased, 39.4% moderately increased). The findings are shown in Figure 4.

However, it has to be noted that only 8.4% of respondents had involvement with the community groups or networks other than the VWB Programme that could play notable role in enhancing their decision-making capabilities. This limitation is the reason for the prevalent barriers affecting the decision-making and empowerment of women as revealed in Figure 8.

Interview data have shown that economic independence, supportive relationships, personal responsibility, and education significantly enhanced women's confidence and autonomy in family discussions. Conversely, societal and cultural constraints, traditional roles, health conditions of family members, and social norms, lack of resources, and gender-based discrimination pose

substantial barriers. The findings emphasize the importance of financial stability, education, and supportive family dynamics in empowering women. These insights underscore the need for the VWB Programme to address both economic and social barriers, fostering an environment that supports women’s decision-making power and autonomy comprehensively. Qualitative data further reveals that the VWB Programme has successfully provided various training and skill development sessions, such as poultry farming, duck farming, and sewing, directly contributing to income generation and economic self-sufficiency for beneficiaries. Additionally, training in cleanliness and child care has been noted, emphasizing the programme’s holistic approach. However, engagement in community support networks is limited (only 8.4%), with some involvement in Union Council meetings, NGOs, disability allowances, and the “One House One Farm” initiatives. This suggests a need for increased awareness and facilitation of community-based support networks to further empower women in their decision-making processes.



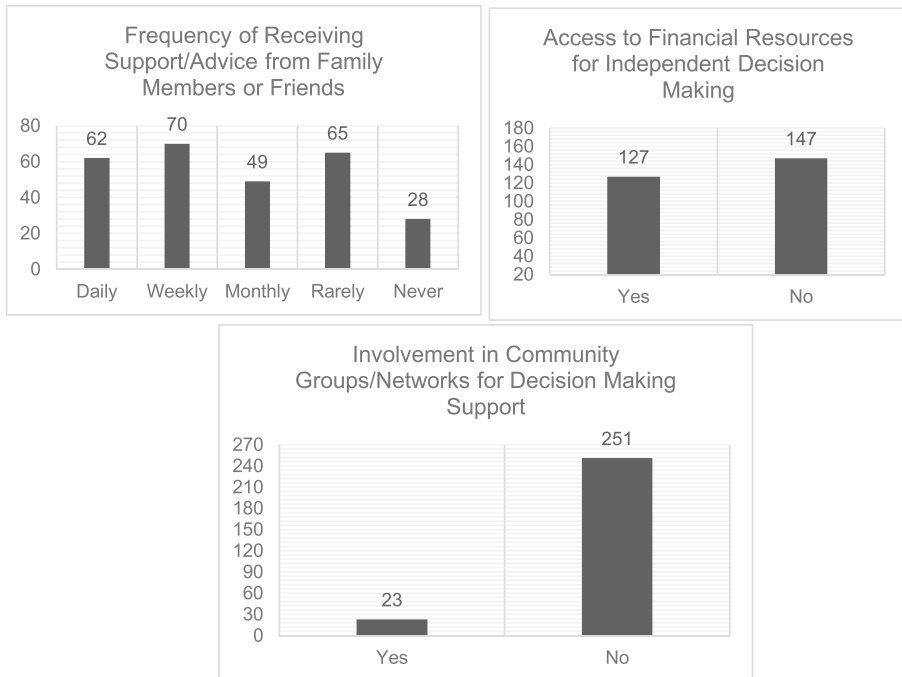


Figure 4: Influencing Factors in Decision-making among VWB Beneficiaries

4.4 Statistical Analysis to assess the impact of VWB on decision-making power among beneficiaries (Before-After Comparison)

Before participating, many women reported low confidence and limited involvement in household decisions, with only 12.8 % feeling “very comfortable” in expressing their opinions regarding household decisions. Besides, most of them were slightly involved in deciding household expenses (43.8%). They primarily made decisions regarding their children’s education and healthcare, with limited influence on family decisions and no influence on major family purchases. The findings of their decision-making status before joining the VWB are presented in Figure 5.

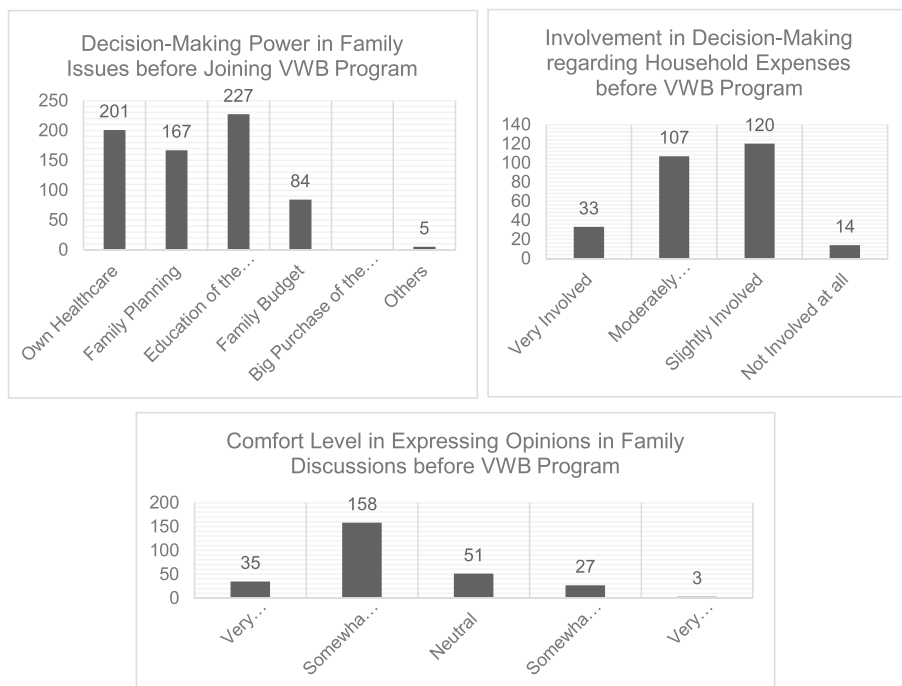


Figure 5: Decision-making Situation before joining VWB

Post-Programme, there was a marked improvement, with 70.4% of participants reporting feeling “very” and “somewhat confident” combined in expressing their opinions within their household. Key factors influencing this empowerment included access to educational opportunities, family support (54.7% reported strong support), and involvement in income-generating activities (47.4%). Additionally, 84.3% of respondents indicated they had become more assertive in expressing their opinions since participating in the VWB Programme that are previously discussed in Figure 3 and 4. The majority of respondents (66.8%) also reported being involved in family budget and big purchases of the family (51.1%), which were significantly lower before the programme, underscoring the broad impact of the programme on various aspects of household decision-making. In addition, VWB has positively changed their level of autonomy (around 80%) and positive family support (95.5%). These have been possible due to the relevance of the training sessions as reported by more than 98% of beneficiaries, and 32.2% frequently and another 47.2% applied the knowledge gained from the training sessions. The findings are shown in Figure 6.

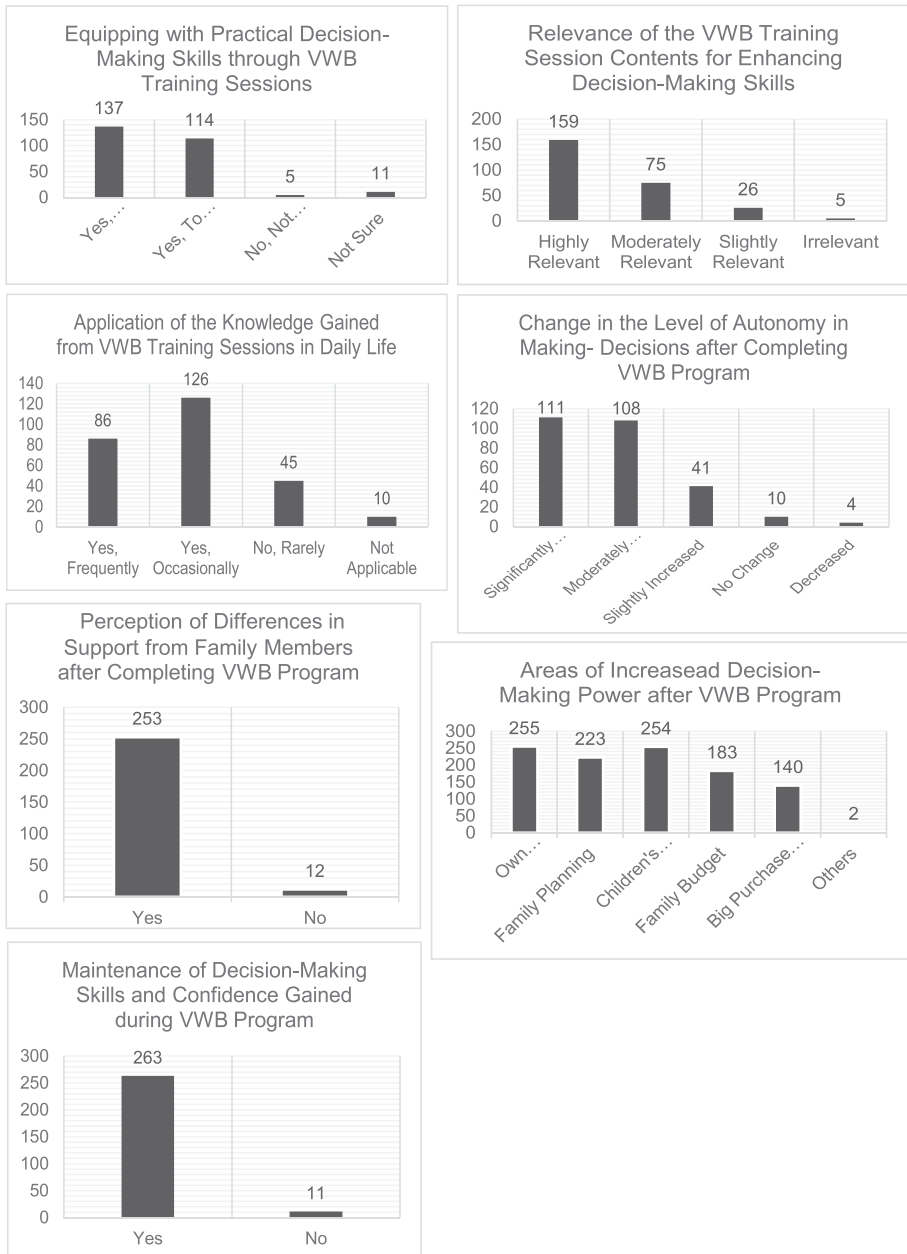


Figure 6: Decision-making situation after finishing VWB cycle

Interview data validate the findings, revealing that the VWB Programme significantly enhances beneficiaries' decision-making power, primarily through increased income and economic stability. Participants reported greater confidence and influence in family decisions, often stemming from their financial contributions and improved skills. The training sessions played a crucial role in this empowerment, although some respondents noted that financial instability still poses challenges. Overall, the programme has positively impacted women's assertiveness and decision-making abilities, highlighting the need for continued support and skill development to address persistent financial and social barriers.

The beneficiaries were asked to assess both their confidence in decision-making and their actual decision-making ability in family and work life before and after the programme. They were asked to rate their confidence and decision-making ability on a scale from 1 (Lowest Score) to 5 (Highest Score). The results are portrayed in Figure 7.

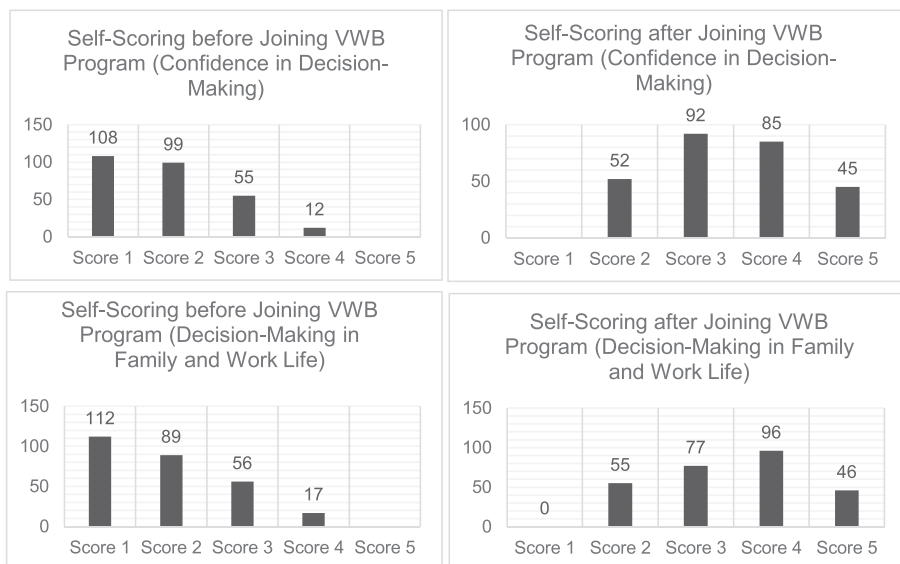


Figure 7: Self Scoring on decision-making by the Beneficiaries before and after the VWB Programme

To evaluate the effectiveness of the VWB Programme on enhancing women's decision-making power, two paired-sample t-tests were conducted to identify research objectives 3. The tests examined the beneficiaries' self-assessed decision-making powers before and after the VWB interventions focusing on

their “Confidence in Decision-Making (Test 1)” as well as their “Decision-Making in Family and Work Life (Test 2)”. The results of both tests are highlighted in Table 2.

Table 2: Paired-sample t-tests on self-scoring questions

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error
Pair 1	Self-Scoring before Joining VWB Programme (Confidence in Decision-Making)	1.89	274	.873	.053
	Self-Scoring after Joining VWB Programme (Confidence in Decision-Making)	3.45	274	.979	.059
Pair 2	Self-Scoring before Joining VWB Programme (Decision-Making in Family and Work Life)	1.92	274	.926	.056
	Self-Scoring after Joining VWB Programme (Decision-Making in Family and Work Life)	3.49	274	.995	.060

For both tests, the results show that the decision-making power of women has been significantly enhanced after their involvement in the VWB Programme. The mean self-scoring for their “Confidence in Decision-Making” increased from 1.89 (SD 0.87) before joining VWB to 3.45 (SD 0.98) after joining the VWB Programme. Here, the t-statistic is -51.69 ($p < 0.001$) indicating significant improvement in the beneficiaries’ decision-making power after finishing the Programme. Again, the mean self-scoring for their “Decision-Making in Family and Work Life” increased from 1.92 (SD 0.92) before joining the Programme to 3.49 (SD 1.00) after completing the VWB Programme. The t-statistic is -52.19 ($p < 0.001$) similarly representing a large and significant impact of the VWB Programme on the beneficiaries’ decision-making abilities in the decision-making in family and work life after joining and finishing the Programme. The negative t-value indicates that the decision-making confidence has been significantly increased among the VWB beneficiaries after joining the Programme.

Chi-square tests reinforced the findings that have revealed significant associations between beneficiaries’ decision-making power with different variables. The results of the chi-square tests are presented in Table 3.

Table 3: Chi-square Tests between Self-Scoring after Joining VWB Programme (Decision-Making in Family and Work Life)” and other variables

Variables	Chi-square Value	p-value	Significance
Age	361.518	<0.001	Significant
Educational background	489.324	<0.001	Significant
Access to non-formal education/training	187.424	<0.001	Significant
Authority to Make Decisions regarding Own Healthcare	249.61	<0.001	Significant
Authority to Make Decisions regarding Family Planning	293.89	<0.001	Significant
Involvement in Income generating Activities outside the Household	266.187	<0.001	Significant
Support/encouragement from Family Members to Pursue Own Goals	291.977	<0.001	Significant
Training or Skill Development Sessions Received through VWB Programme	214.884	<0.001	Significant

In all the cases, the p-value is less than 0.05 which indicates a significant association between the “Self-Scoring after Joining VWB Programme (Decision-Making in Family and Work Life)” and other variables as shown in Table 3. The results accept the alternative hypothesis (H1) and reject the null hypothesis (H0) implying that the VWB Programme significantly enhances decision-making power among beneficiaries.

4.5 Challenges and opportunities faced by beneficiaries

The study also revealed the persisting challenges and opportunities faced by women in decision-making processes. Most respondents (63.1%) reported that cultural norms and expectations limited their decision-making abilities, while 13.8% frequently and another 44.5% occasionally encountered challenges due to a lack of access to relevant information or resources. Gender-based discrimination occasionally hindered decision-making for 35.7% of respondents, highlighting the persistent social barriers women face. Despite these challenges, 23% of respondents reported receiving strong family support for their involvement in decision-making processes. Access to education and information significantly empowered 10% of respondents, and overall, 89.4% of respondents were empowered to make informed decisions. Community networks and resources for skill-building and decision-making support were accessible to 45.6% of respondents to some extent, indicating the need for enhanced community support mechanisms. The findings are shown in Figure 8.

Interviews have revealed that while the VWB Programme has significantly enhanced decision-making power among participants through increased income, self-confidence, and a significant family role, several challenges persist. Financial instability, lack of education, and absence of spousal support were major barriers. Many participants highlighted the need for further training, financial aid, and resources like sewing machines and livestock to enhance their capabilities. The findings suggest that addressing these challenges through targeted interventions could further empower women, ensuring sustained socio-economic stability and greater autonomy in decision-making within their families and communities.

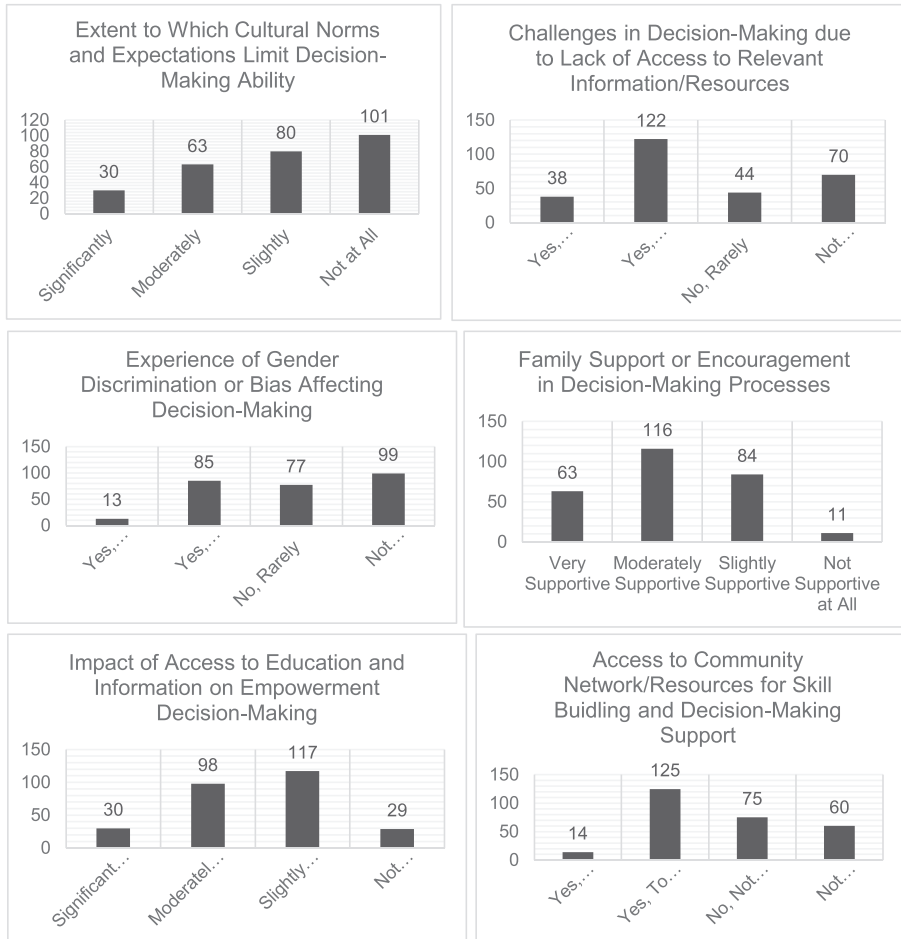


Figure 8: Challenges and Opportunities faced by the VWB beneficiaries in decision-making

4.6 System Dynamics Model Formulation and Implications from the Model

To identify the research objective 5 (To identify the ways of designing empowerment-focused Social Safety Net programmes similar to the VWB), the System Dynamics Model is formulated in this section based on the findings of the study. The model visually represents the pathways through which the VWB Programme enhances women's decision-making power in Bangladesh. Drawing from extensive mixed-method research involving 274 beneficiaries across Narayanganj and Chattogram, the model captures the interconnected feedback loops that drive or constrain empowerment outcomes. It identifies both reinforcing mechanisms—such as education, training, income generation, and family support—and balancing constraints, particularly entrenched cultural norms and gender-based discrimination.

The model is designed to inform policy-makers, development practitioners, and programme designers seeking to refine or replicate empowerment-focused social safety nets.

4.6.1 System Dynamics Model Narrative

a. Reinforcing Loops (Positive Feedback)

VWB

- Training → Skills → Income → Economic Stability → Confidence → Decision-Making Power

training sessions build technical and financial skills, enabling participation in income-

- Family Support → Confidence → Increased Participation → Decision-Making Power

generating activities. This increases financial independence and household decision-making influence.

Encouragement from family boosts self-confidence, reinforcing women's engagement in key decisions.

Empowered women apply their skills more effectively, further reinforcing financial and social empowerment.

- Decision-Making Power → Skill Utilization → Income → Confidence

b.

- Cultural Norms → Reduced Confidence and Autonomy

Balancing Loop (Negative Feedback)

Deep-rooted social norms and gender roles continue to inhibit decision-making autonomy for some women. These dynamics act as a counterforce to empowerment gains and require sustained community-level interventions.

c. Neutral Supportive Elements

The Neutral Supportive Elements factors do not directly create feedback loops but provide critical enabling conditions that amplify the reinforcing mechanisms when adequately addressed. There are the Core Stock Variables and the Flow Variables. They are shown below, along with their characteristics.

4.6.2 Key Feedback Loops:

- Training Sessions → increase Knowledge & Skills → boosts Income-Generating Activities → raises Economic Stability → increases Confidence & Autonomy → boosts DMP → strengthens participation in Training & Community

over time	increase or decrease
<ul style="list-style-type: none">• Women's Decision-Making Power (DMP)• Confidence & Autonomy• Household Economic Stability• Community Engagement• Training Completion Rate	<ul style="list-style-type: none">• Rate of Training Completion• Income Generation Rate• Access to Resources Rate• Supportive Family Interaction Rate• Cultural Resistance Dissolution Rate

a. Empowerment Reinforcement Loop (Positive Feedback)

b. Social Support Loop (Positive Feedback)

- Family Support → increases Participation in Decision-Making → boosts Confidence → improves DMP → encourages further Family Support
- VWB Engagement → slight rise in Community Involvement → improves Access to Info & Peer Support → increases Confidence & Resources → improves DMP

c. Community Participation Loop (Positive Feedback)

d. Cultural Constraints Loop (Balancing/Negative Feedback)

The model has been depicted in Figure 9 and the equations are derived from the figure. The variables and their influence are shown in Table 4.

- Cultural Norms + Gender Bias → reduces Participation & Confidence → suppresses DMP
- Requires intervention via Gender Awareness Training to weaken this loop

Table 4: Key variables and their relationships

Variable	Type	Influence
Training Sessions	Input	Directly increase skills, knowledge, and confidence
Income-Generating Activities	Flow	Positively impact financial independence and DMP
Education Level	Stock	Higher levels improve resource access and decision-making
Family Support	Stock	Strong family backing boosts program outcomes
Cultural Norms	Constraint	Slows down improvement in DMP unless actively mitigated
Access to Resources	Stock	Directly contributes to confidence and independence
Community Networks	Stock	Potential long-term enabler for the sustainability of empowerment

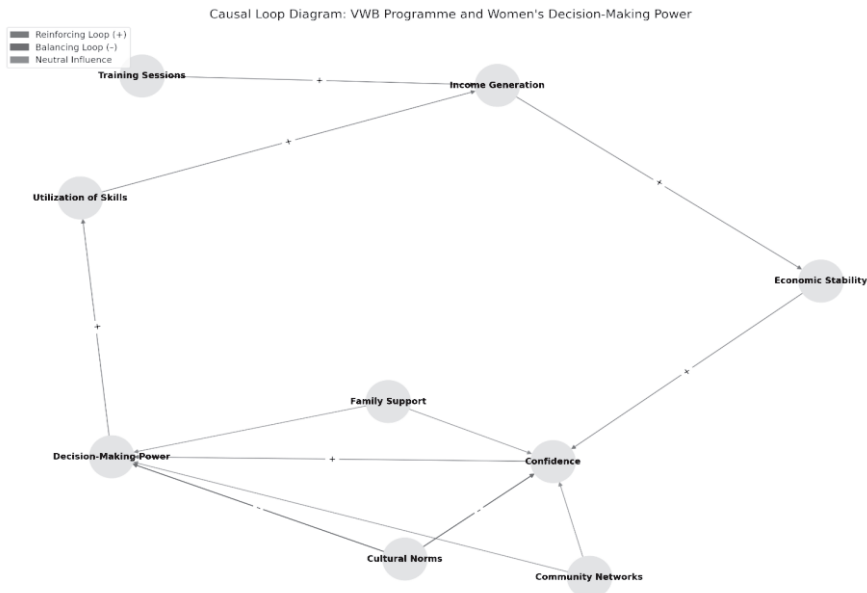


Figure 9: Casual Loop Diagram of the System Dynamics model

Causal Loop Diagram in Figure 9 shows the formulation of the VWB programme model with loop types where blue nodes represent key factors, arrows indicate the direction of influence, green arrows (+) represent reinforcing loops, red arrows (–) indicate the balancing loop, and the grey arrows, show the neutral influences.

Here are the differential equations representing the dynamic system underlying the VWB Programme model:

1. Confidence Growth Rate:

$$\frac{dC(t)}{dt} = 0.05 \cdot T(t) + 0.03 \cdot F(t) - 0.02 \cdot B(t)$$

2.

Income Growth Rate:

$$\frac{dI(t)}{dt} = 0.06 \cdot C(t) + 0.04 \cdot T(t)$$

3. Decision-Making Power Growth Rate:

$$\frac{dD(t)}{dt} = 0.04 \cdot C(t) + 0.04 \cdot I(t) + 0.03 \cdot F(t) - 0.03 \cdot B(t)$$

These equations describe how confidence (C), income (I), and decision-making power (D) evolve over time under the influence of training (T), family support (F), and cultural barriers (B).

4.6.3 Model Assumptions and Parameter Justification

The system dynamics model for the VWB Programme incorporates a set of assumed coefficients to represent the influence of key variables—training, family support, cultural norms, confidence, income, and decision-making power—over time. These coefficients were not statistically estimated but were carefully calibrated based on empirical insights from the VWB study and established principles in system dynamics modeling.

4.6.4 Empirical Grounding from Study Data

Quantitative findings from the study, including t-tests, chi-square values, and reported participant percentages, were used to determine the relative strength of influence for each variable where: training effectiveness showed a high impact of over 98% participation and strong skill application rates; family support was cited as a key enabler by 54.7% of respondents, supporting its moderate influence; and cultural norms were reported as limiting by over 63.1% of participants, warranting a moderate negative effect. These findings guided the proportional weighting of each factor in the model.

4.6.5 Coefficient Range Justification

To reflect realistic behaviour in monthly time steps (over a 24-month period), coefficients were chosen within these ranges. They are shown in Table 5.

Table 5: Coefficient Range Justification

Variable	Role in Model	Coefficient	Justification
Training (T)	Strong positive driver	0.05–0.06	High application and relevance in decision-making and income generation
Family Support (F)	Moderate positive	0.03	Emotional and practical support drives confidence and autonomy
Cultural Barrier (B)	Moderate negative	–0.02 to –0.03	Social norms and discrimination pose persistent challenges
Confidence (C)	Dynamic enabler	N/A (intermediate)	Impacts income and decision-making power
Income (I)	Direct contributor	0.04	Reflects economic self-reliance, enabling independent decision-making

4.6.6 System Dynamics Modelling Principles

The model adheres to standard system dynamics practices:

- Normalized scales (0 to 1) for variable values
- Gradual monthly increments to represent behaviour over time
- Use of linear relationships to maintain interpretability and tractability

4.6.7 Behavioural Validation

Simulated trajectories of confidence, income, and decision-making power showed realistic growth patterns, reflecting: initial low baseline conditions; gradual improvement as training and support take effect; and saturation as benefits stabilize post-programme. This consistency supports the validity of the chosen coefficient structure.

4.6.8 Simulation from the Model:

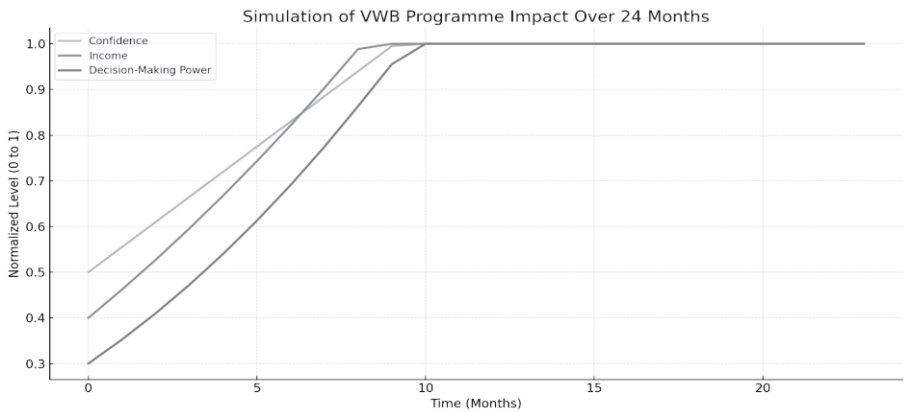


Figure 10: Simulation from the VWB System Dynamics model

The simulation in Figure 10 demonstrates how key variables evolve over a 24-month VWB Programme cycle where: confidence grows steadily due to

training and family support, slightly dampened by cultural norms; income rises as confidence builds, reflecting improved participation in income-generating activities; and decision-making power shows a strong upward trend, influenced by gains in confidence, income, and support systems, but partially constrained by cultural barriers. This model validates the programme's theory of change that empowerment compounds over time when core enablers are in place.

5. Recommendations and Way Forward

The system dynamics model, developed to simulate the impact of the VWB Programme on women's decision-making power, is rooted in programmatic data and qualitative insights, but it necessarily simplifies complex real-world dynamics. The relationships among variables are assumed to be linear, with fixed coefficients representing proportional influence. While this approach enables interpretability and clarity, it overlooks the potential for nonlinear interactions, feedback saturation, or time-varying effects that often characterize human behaviour and social systems. Additionally, the model uses heuristic rather than statistically derived parameters, which limits its empirical precision.

Furthermore, the model does not incorporate a control group or counterfactual scenario, making it difficult to isolate the specific effects of the VWB Programme from broader contextual influences. Key external variables—such as health status, spousal involvement, and institutional support—are also omitted, despite their potential to affect empowerment outcomes. As such, while the model provides a helpful conceptual and illustrative framework, its quantitative results should be viewed as indicative rather than predictive, and further refinement is necessary for rigorous policy application.

Based on the quantitative study, we have developed several policy recommendations for the government's consideration.

5.1. Recommendations

Increase Financial Support: The findings have revealed that it is imperative to provide additional financial resources to help women achieve financial independence and enhance decision-making power. It will work as important catalyst to sustain the benefits of the VWB.

Expand Educational Opportunities: The study has shown that access to educational opportunities is positively associated with the increase in decision-making power. It necessitates the need for more educational opportunities for women. More vocational training programmes should be provided which are tailored to women's needs, focusing on income-generating skills.

Strengthen Community Networks: Women's involvement in the community networks is significantly low while it is associated with the increase in decision-making power. As a result, future VWB training sessions should focus on expanding community networks. Furthermore, it has to be ensured that beneficiaries have access to information and resources aiding decision-making processes.

Promote Gender Equality: The VWB Programmes, particularly the training sessions, should implement programmes addressing gender-based discrimination and educate communities on gender equality.

Enhance Family Support: Family support is crucial for exercising women's decision-making power. So, initiatives should be developed encouraging family members to support women's decision-making roles within households.

Improve Monitoring and Evaluation: The study has revealed that long term benefits of the programme are uncertain due to the lack of continued support. So, there should be a robust system to track the programme's progress and make informed adjustments.

Foster Resilience and Adaptation: Women in the society face persistent social and cultural barriers as evident from the study. Challenges for the vulnerable women are even more pressing. These barriers restrict their economic and social empowerment. VWB through its training sessions should focus on supporting women in developing resilience and skills to navigate social and cultural barriers in order to enjoy autonomy in decision-making.

Tailor Interventions to Individual Needs: Women in need face diverse challenges in the social and economic aspects of the family. To meet the demands of their individual needs, it is necessary to design flexible interventions addressing the specific challenges faced by different groups of women. The training programmes should be designed keeping this in mind that not all the women need all kinds of training. Some of them may already be involved in income generating activities. So, training should be given to the women focusing on the types of training that will benefit them.

5.2. Way Forward

This study lays the groundwork for future research. A more extensive study with a larger sample size, including a control group, would provide more robust and generalizable results. Additionally, a cohort study approach, with baseline assessments at the beginning of the VWB cycle and follow-up assessments after completing the programme, would offer deeper insights into the long-term impacts and sustainability of the programme's benefits. Initiatives targeted at addressing the identified challenges in this study such as cultural norms, limited resources, and gender-based discrimination can help in redesigning more effective VWB Programme in the future. Furthermore, this study has

emphasized continued support and expansion of similar programmes for empowering women in the society.

Besides, empirical assessment is recommended by using statistical techniques to improve the system dynamics model's accuracy and relevance. The reliability of the model might be increased and the effects of interventions could be more precisely simulated by using regression analysis or structural equation modeling (SEM) on the VWB dataset to produce empirically supported coefficients for each causal pathway. During the course of the program, longitudinal data collection—ideally involving pre- and post-intervention measurements—would also allow for dynamic modeling of time-dependent changes in income, confidence, and decision-making ability.

6. Conclusion

The study has revealed that the VWB Programme in Bangladesh has been effective in enhancing the decision-making power among the beneficiaries. Analysis of the survey data supported by the interviews indicates that the programme has increased the beneficiaries' confidence, autonomy, and involvement within the household decision-making processes. The mean self-score of their confidence increased from 1.89 before joining to 3.45 after finishing and the mean self-score of their decision-making within the family and work life increased from 1.92 before joining to 3.49 after completing the VWB cycle. These improvements have been supported by the statistically significant t-tests and chi-square tests that further underscore the programme's effectiveness in promoting women empowerment. The key influential factors within the programme that have substantially enhanced women's decision-making power include access to education, family support, and involvement in income-generating activities.

However, challenges such as persistent cultural norms, lack of resources, and gender-based discrimination highlight the need for targeted interventions to enhance the programme's effectiveness. The system dynamics model discussed both these factors through its reinforcing and balancing feedback loops. In summary, the comprehensive analysis carried out with the primary data reveals that VWB Programme effectively enhances women's decision-making power. Conspicuous improvements in their confidence, autonomy, and involvement in various household decisions demonstrate the programme's success in empowering women. Addressing the identified challenges through targeted interventions and better designing the programme should add new dimension to the programme's women empowerment facet. This paper emphasizes the importance of continuous support and expansion of the programmes like VWB to empower women and strengthen their roles in decision-making processes within their households and communities.

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