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Isabela State University BIDANI-PNEA: A Multi-Faceted Strategy in Empowering Communities Through Fortification of Product Development, Livelihood, and Proper Nutrition

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Abstract

This study examines the implementation of the Barangay Integrated Development Approach for Nutrition Improvement–Participatory Nutrition Enhancement Approach (BIDANI-PNEA) by Isabela State University (ISU) in Barangay Salvacion, Echague, Isabela, aimed at addressing malnutrition and economic instability through an integrated, community-based extension framework. Grounded in participatory and community empowerment principles, the study utilized a descriptive and extension-oriented research design involving surveys, community needs assessment, training modules, and evaluation tools. A total of 70 community members participated in capacity-building activities on product development, packaging, and costing, while 22 malnourished children were included in a feeding program. Findings revealed a reduction in malnutrition cases from 22 to 20 children and improved nutritional status among most participants. The program enhanced community knowledge on proper nutrition and enabled residents to produce nutrient-enriched Sagip Nutri-Pack products using locally available resources. Capacity-building initiatives equipped participants with entrepreneurial skills, leading to the establishment of rolling stores that generated income, increased employment opportunities, and strengthened economic resilience. The project also fostered strong collaboration among academic institutions, local government units, and community stakeholders, promoting sustained engagement and local ownership. The study concludes that integrating nutrition intervention with livelihood development and participatory strategies effectively improves both health and socio-economic conditions in rural communities. It recommends expanding the program to other barangays and strengthening institutional partnerships to sustain and scale its impact. The study aligns with SDG 2 (Zero Hunger), SDG 3 (Good Health and Well-Being), and SDG 8 (Decent Work and Economic Growth) by addressing malnutrition, improving health outcomes, and promoting local entrepreneurship. Its sustainability impact lies in enhancing community resilience through integrated public health, economic, and educational interventions that support long-term self-sufficiency and development.

Keywords: Community-Based Extension, Economic Empowerment, Malnutrition, Nutrition Intervention, Participatory Approach, Product Development, Sagip Nutri-Pack, Sustainable Livelihood

1. Introduction

Malnutrition remains a critical public health issue in the Philippines, particularly among children, pregnant and lactating women, and the elderly. High rates of underweight and stunting reflect persistent socioeconomic inequalities and limited access to adequate nutrition. Poor nutrition adversely affects health, cognitive development, and productivity, thereby constraining community development (Moon, Nam, & Dhakal, 2014; Palutturi, Chu, & Moon, 2015). The BIDANI program, originally developed by the University of the Philippines Los Baños in 1978, promotes a holistic and participatory approach integrating nutrition, agriculture, health, and livelihood development. It emphasizes community empowerment and partnership to achieve sustainable and self-sufficient development (Palutturi, 2013; Ministry of Home Affairs & Ministry of Health [MOHA & MOH], 2005). The ISU BIDANI-PNEA initiative adapts this framework to local conditions in Barangay Salvacion, incorporating nutrition education, product development, and livelihood training. The introduction of Sagip Nutri-Pack—nutrient-enriched food products—addresses both nutritional deficiencies and economic challenges, enabling communities to improve health outcomes while generating income (Bailey, 2010; Adamson, 2010).

Existing literature emphasizes that nutrition is closely linked to health, productivity, and socio-economic development. Malnutrition contributes to long-term developmental challenges, including poor academic performance and reduced earning potential (Kerrigan et al., 2015; Meeker et al., 2019). Community empowerment is a key strategy in addressing these challenges. Participatory approaches that involve local stakeholders in planning and implementation lead to more effective and sustainable outcomes. Studies highlight that community engagement enhances ownership, responsiveness, and long-term impact of interventions (Palutturi et al., 2017). Holistic and integrated development models, such as BIDANI, demonstrate that combining health, nutrition, and livelihood initiatives creates synergistic effects that improve overall community well-being (Dooris, 2009; Palutturi, 2015).

At the local level, Barangay Salvacion faces challenges including high malnutrition rates, limited livelihood opportunities, and inadequate access to resources. These conditions reflect broader national issues, where rural communities continue to experience disparities in health and economic development. Globally, malnutrition remains a major concern linked to poverty and inequality. International frameworks advocate integrated and community-driven solutions to address these issues. The BIDANI approach aligns with these global efforts by integrating nutrition improvement with socio-economic development strategies (Drexhage & Murphy, 2010).

The BIDANI-PNEA project is grounded in community empowerment theory, which posits that sustainable development is achieved through active participation and local ownership. Empowerment-based approaches enable communities to identify their needs, implement solutions, and sustain outcomes independently (Adamson, 2010; Bailey, 2010). The project also aligns with the settings-based approach to health promotion, which emphasizes holistic and context-specific interventions for improving health outcomes (Dooris, 2009). By integrating nutrition, livelihood, and education, the program reflects a systems-oriented framework for sustainable community development (Palutturi, 2015).

Despite existing nutrition programs, many rural communities continue to experience persistent malnutrition and limited economic opportunities. Traditional interventions often focus solely on health without addressing underlying socio-economic factors. The BIDANI-PNEA project addresses this gap by integrating nutrition intervention with livelihood development and capacity building. Barangay Salvacion's limited access to training, resources, and income-generating opportunities highlights the need for sustainable, community-driven solutions. The program aims to fill this gap by promoting self-sufficiency, improving health outcomes, and enhancing economic resilience (Dooris, 2009; Palutturi, 2015).

The study aligns with several Sustainable Development Goals:
SDG 2 – Zero Hunger: By addressing malnutrition through nutrient-enriched Sagip Nutri-Pack products.
SDG 3 – Good Health and Well-Being: Through improved nutritional status and health education.
SDG 8 – Decent Work and Economic Growth: By creating livelihood opportunities through product development and rolling store initiatives.
These alignments demonstrate the program's contribution to improving food security, public health, and economic stability within the community (Drexhage & Murphy, 2010).

This study contributes to multiple dimensions of sustainability:
Public Health Sustainability: By reducing malnutrition and improving nutritional awareness.
Socio-economic Sustainability: Through livelihood creation and income generation via micro-entrepreneurship.
Community Sustainability: By fostering local participation, ownership, and empowerment.
Educational Sustainability: Through capacity building and knowledge transfer using training modules.
Innovation and Technological Sustainability: Through the development of fortified food products utilizing local resources.
By integrating health, education, and economic strategies, the BIDANI-PNEA project demonstrates a multidisciplinary approach to sustainable community development, offering a scalable model for other rural communities.

2. Material and methods

2.1 Research Design

The study utilized a descriptive and participatory research design anchored on a community-based extension framework. It integrated assessment, planning, implementation, and evaluation phases to address nutritional and economic concerns. The design emphasized a holistic and bottom-up approach, ensuring that interventions were responsive to local needs while promoting community empowerment and sustainability.

2.2 Locale of the Study

The study was conducted in Barangay Salvacion, Echague, Isabela, a rural community characterized by high malnutrition rates, limited livelihood opportunities, and inadequate access to resources. The area was selected as the pilot site for the BIDANI-PNEA program due to its need for integrated nutrition and economic interventions.

2.3 Respondents of the Study

The respondents included community members of Barangay Salvacion who participated in the program's capacity-building activities. A total of 70 residents, consisting of both male and female participants across various age groups, were involved in training on product development, packaging, and costing. Additionally, 22 malnourished children aged 0–59 months were included in the feeding program to address nutritional deficiencies.

2.4 Sample and Sampling Procedure

The study employed purposive sampling, selecting participants based on their relevance to the program's objectives. Community members were chosen for their willingness to participate in training and livelihood activities, while malnourished children were identified through pre-survey nutritional assessments conducted in the barangay. The selection ensured that both vulnerable groups and potential micro-entrepreneurs were included in the intervention.

2.5 Research Instrument

Data were gathered using surveys, community needs assessment tools, and evaluation forms designed to capture demographic profiles, nutritional status, and participant feedback. Training modules and Information, Education, and Communication (IEC) materials were also developed and utilized as instructional instruments. These materials were validated by instructional experts and registered with the Intellectual Property Office of the Philippines to ensure quality and standardization of training delivery.

2.6 Data Gathering Procedure

The data gathering process followed three major phases: pre-implementation, implementation, and post-implementation. During the pre-implementation phase, the research team conducted participatory planning sessions with stakeholders, including barangay officials, health workers, and partner agencies. A comprehensive needs assessment was carried out to identify key issues such as malnutrition and limited income opportunities. Formal agreements among collaborating institutions were established to ensure coordinated implementation, and training modules were prepared based on identified needs. In the implementation phase, capacity-building activities were conducted through orientations, demonstrations, and hands-on training sessions. Participants were trained in the production of Sagip Nutri-Pack products using locally available ingredients, as well as in packaging, labeling, and costing. A rolling store system was introduced to provide participants with immediate opportunities for income generation and practical application of acquired skills. Continuous monitoring and support were provided throughout this phase to ensure effective participation and skill development. The post-implementation phase focused on sustaining project outcomes and evaluating effectiveness. The rolling store was institutionalized as a long-term livelihood initiative managed by community members. Evaluation data were collected through surveys and feedback mechanisms to assess the impact of the training and interventions, including changes in nutritional status and livelihood outcomes.

2.7 Data Analysis Techniques

Data were analyzed using descriptive methods, including frequency counts and percentage distributions, to summarize demographic characteristics, nutritional status, and program outcomes. Evaluation results were interpreted to determine the effectiveness of the interventions, particularly in reducing malnutrition cases and improving participants' skills and economic opportunities. The analysis focused on identifying patterns and measuring changes resulting from the implementation of the BIDANI-PNEA program.

3. Results and Discussion

3.1 Community Health and Nutrition Outcomes

3.1.1 Reduction in Malnutrition

The feeding program initially targeted 22 malnourished children aged 0–59 months. After the intervention, the number of malnutrition cases decreased to 20. Post-assessment data showed a majority of children classified as having normal nutritional status, with only minimal cases of underweight and stunting and no severe conditions reported. The feeding intervention was implemented over six months with the support of local stakeholders, including educators, health workers, and community leaders. The observed reduction in malnutrition indicates the effectiveness of providing nutrient-dense food products such as Sagip Nutri-Pack, which were fortified with locally available ingredients. This aligns with the concept that targeted nutrition interventions can significantly improve child health outcomes when supported by community participation. The results support the broader understanding that improving access to nutritious food contributes to better health and developmental outcomes, particularly among vulnerable populations.

3.1.2 Enhanced Nutritional Awareness

Community members demonstrated increased awareness of proper nutrition through participation in training sessions on recipe development and food preparation. Families began incorporating Sagip Nutri-Pack products into daily meals, reflecting improved knowledge of balanced diets and nutrient-rich food consumption. This improvement suggests that education and hands-on training are critical components in promoting sustainable dietary changes. By equipping participants with practical knowledge, the program fostered long-term behavioral changes that contribute to improved household nutrition and food security. The integration of education with intervention supports the idea that knowledge transfer is essential for sustaining health improvements in community-based programs.

3.2 Capacity Building and Skills Development

3.2.1 Training and Participation of Residents

A total of 70 residents, consisting of both men and women, participated in capacity-building activities focused on product development, packaging, labeling, and costing. Participants gained hands-on experience in producing different types of Sagip Nutri-Pack products using cassava, corn, and rice fortified with nutritional additives. The high level of participation and skill acquisition demonstrates the effectiveness of experiential learning approaches in community development. By actively engaging participants in practical training, the program enhanced their competencies and confidence to undertake entrepreneurial activities. This finding reflects the importance of capacity building as a foundation for empowerment and sustainable livelihood development.

3.2.2 Development of Practical Skills in Product Innovation

Participants acquired technical skills in food processing, quality control, packaging, and recipe formulation. The training enabled them to produce marketable and nutritionally enhanced products tailored to community needs. The development of these practical skills highlights the role of innovation in addressing both nutritional and economic challenges. By utilizing locally available resources, the program promoted cost-effective production while ensuring nutritional value. This supports the concept that community-based innovation can drive sustainable solutions in resource-limited settings.

3.3 Economic Empowerment and Livelihood Outcomes

3.3.1 Establishment of Rolling Stores

The project successfully established rolling stores within the community, enabling residents to sell Sagip Nutri-Pack products locally. These stores served as accessible platforms for product distribution and income generation, with some managed by local officials and residents. The establishment of rolling stores demonstrates the effectiveness of integrating livelihood initiatives into health programs. By providing immediate opportunities for income generation, the project enhanced economic resilience and encouraged entrepreneurial engagement. This approach reinforces the importance of linking economic activities with community development interventions.

3.3.2 Increased Employment and Income Opportunities

The demand for Sagip Nutri-Pack products led to increased labor requirements, creating additional employment opportunities within the barangay. Residents experienced revenue growth through product sales, contributing to improved household income and economic stability. These outcomes indicate that livelihood interventions can significantly enhance economic conditions when aligned with local needs and resources. The increase in employment and income supports the role of micro-entrepreneurship in promoting sustainable economic growth, particularly in rural communities.

3.4 Community Engagement and Institutional Collaboration

3.4.1 Strengthened Multi-Sectoral Partnerships

The project established strong collaboration among Isabela State University, the University of the Philippines, LGU-Echague, and barangay stakeholders. This partnership facilitated resource sharing, technical support, and coordinated implementation of program activities. The success of these collaborations underscores the importance of multi-sectoral engagement in achieving sustainable development outcomes. Partnerships enhance the effectiveness of interventions by combining expertise and resources, thereby improving program reach and impact.

3.4.2 Community Participation and Ownership

Community members actively participated in all phases of the project, including planning, implementation, and evaluation. This involvement fostered a sense of ownership and responsibility, contributing to the sustainability of the program. The participatory approach highlights the critical role of community ownership in ensuring long-term success. When individuals are directly involved in decision-making and implementation, they are more likely to sustain and expand initiatives, reinforcing the principles of empowerment and self-reliance.

3.5 Knowledge Development and Sustainability Mechanisms

3.5.1 Development of Educational Materials

Instructional materials, including modules and guides on product development and packaging, were developed and utilized during training sessions. These materials served as references for participants and supported continuous learning within the community. The creation of structured educational resources enhances knowledge retention and facilitates the replication of training activities. This supports the sustainability of the program by enabling participants to transfer knowledge to others within the community.

3.5.2 Sustainability Through Knowledge Transfer

Participants were able to retain and apply the knowledge gained from training, using the modules to reinforce their skills and mentor others. This contributed to the continuity of the program and the expansion of its benefits within the barangay. This outcome demonstrates that knowledge transfer is a key factor in sustaining community-based interventions. By

empowering individuals to become knowledge carriers, the program ensures long-term impact beyond the initial implementation phase.

4. Conclusion & Recommendations

The findings of the BIDANI-PNEA project in Barangay Salvacion demonstrate that a community-centered, participatory approach effectively addresses both malnutrition and economic instability through integrated interventions. The implementation of Sagip Nutri-Pack products, combined with capacity-building activities, improved nutritional outcomes among children and enhanced residents' knowledge and skills in product development and entrepreneurship. The establishment of rolling stores further contributed to income generation and employment opportunities, strengthening local economic resilience. Overall, the project highlights the effectiveness of combining nutrition, education, and livelihood strategies in fostering sustainable community development and empowerment.

It is recommended that the BIDANI initiative be expanded to other barangays to replicate its positive impact on nutrition and livelihood development. Continued collaboration with local government units and partner institutions should be strengthened to ensure sustained support, monitoring, and capacity-building efforts. Enhancing partnerships and maintaining the rolling store model as a livelihood strategy are also encouraged to maximize long-term benefits, improve community health, and promote economic growth in underserved rural areas.

Compliance with ethical standards

The author declare no conflict of interest. This study complied with recognized ethical standards for human-participant research by ensuring voluntary participation with informed consent, the right to withdraw without penalty, and strict confidentiality through anonymous, secure, and aggregated data handling. Given the focus on psychological well-being, procedures were non-invasive, and safeguards were observed to minimize discomfort, with guidance to appropriate support services when needed, and required institutional permissions were secured for instrument use and access to academic records.

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