

Effectiveness of Oplan Ligtas Na Pamayanan in Batangas City: Basis for Program Refinement

Jethro E. Villasanta, DPA¹, Camilo C. Alulod, PHD²

¹Bureau of Fire Protection, Region 4A-CALABARZON, Batangas City Fire Station

²Batangas State University, The National Engineering University, Batangas City

ABSTRACT: This study aimed to assess the effectiveness of the Oplan Ligtas na Pamayanan (OLP) by the Bureau of Fire Protection in Batangas City to develop a framework model and propose capacity building program to further improve its implementation. Identifying the indicators of OLP's effectiveness as perceived by BFP personnel and the community, exploring experiences and challenges met in OLP implementation, construction of the structural equation model to validate proposed framework, and finally recommending capacity development programs designed to integrate or enhance the impact of OLP. Moreover, this utilized an exploratory sequential mixed methods research design which made use of both quantitative and qualitative data. The qualitative phase involved key informant interviews with six experienced BFP personnel directly involved in the program. Thematic analysis generated key themes that guided the creation of a researcher-made questionnaire. There were 360 randomly selected barangay officials and community members from 46 barangays who participated in this study. In terms of quantitative data, factor analysis, descriptive statistics, and structural equation modeling using bootstrapping to test the proposed framework model's validity and reliability were used to analyze the gathered data. Findings identified seven refined indicators of effectiveness such as improved safety, stakeholder involvement, operational readiness, risk awareness, risk governance, community engagement, and fire prevention strategies. The BFP personnel experiences yielded to the challenges encountered such as poor community participation, limited resources, inadequate training, and lack of coordination. The community's perception indicated moderate to high awareness regarding these challenges. The proposed framework model demonstrated from structural equation modeling significant relationships in-between identified factors in influencing OLP success. Therefore, the capacity development program was developed along the lines of these findings, stressing training, resource mobilization, and closer collaboration with the community. Thus, the study concluded that while OLP enhanced fire safety awareness in Batangas City, major hindrances in OLP implementation remain that limit its full potential and efficiency. Such findings provide a strong base for the refinement of OLP, and interventions directed toward building fire resilience in local communities.

KEYWORDS: Oplan Ligtas na Pamayanan, Program Effectiveness, Fire Safety, Community Engagement, Implementation Challenges, Capacity Development

I. INTRODUCTION

Fire has long been recognized as both a beneficial and destructive element in human development, supporting industrial growth and daily living while posing significant risks to life, property, and the environment when uncontrolled. As urbanization accelerates and communities become more densely populated, fire hazards grow increasingly complex, requiring adaptive and community-centered risk reduction approaches. Globally, fire incidents continue to result in substantial fatalities and injuries, with residential areas identified as the most vulnerable due to limited safety infrastructure and preparedness mechanisms. In the Philippines, these trends are evident in the persistent rise of fire incidents, as shown in the Bureau of Fire Protection (BFP) reports, including a 25% increase from 2023 to 2024. This pattern is mirrored in Batangas City, where residential fires nearly doubled from 12 cases in 2021 to 23 in 2024, underscoring the urgent need for strengthened community-based fire safety interventions.

To address these risks, the BFP introduced Oplan Ligtas na Pamayanan (OLP) in 2019 as its flagship community-based fire prevention and preparedness program. OLP integrates several key activities—household fire safety surveys, formulation of Community Fire Protection Plans (CFPP), establishment of Community Fire Auxiliary Groups (CFAG), hazard mapping, and community fire drills—aimed at cultivating a fire-resilient culture at the barangay level. Despite its promising design, concerns

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persist regarding its on-ground effectiveness, particularly considering rising residential fire incidents and documented challenges in program execution. Preliminary observations from Batangas City reveal incomplete risk-vulnerability checklists, limited barangay coverage, and inconsistent community participation even after five years of implementation.

The complexity of fire safety implementation highlights the need for evidence-based assessment frameworks to examine program effectiveness, identify operational gaps, and propose refinements. The Community-Based Disaster Risk Reduction (CBDRR) theory supports this need by emphasizing community empowerment, participatory risk assessment, and localized decision-making as essential elements of effective risk reduction. In the context of OLP, understanding how communities and BFP personnel perceive program components—such as risk awareness, operational readiness, stakeholder involvement, and fire prevention strategies—becomes vital in determining whether the program adequately strengthens local fire resilience.

This study evaluates the effectiveness of OLP in Batangas City using an exploratory sequential mixed-methods approach. It first explores the experiences, insights, and challenges reported by key BFP personnel involved in implementing the program. These qualitative themes informed the development of a quantitative instrument administered to 360 barangay officials and residents from 46 participating barangays. Through factor analysis and structural equation modelling, the study identifies key indicators of effectiveness, validates an evidence-based framework, and proposes capacity development interventions tailored to the needs of Batangas City. Findings from this study are expected to support BFP, local government units, and community stakeholders in refining program strategies, optimizing resource allocation, and enhancing collaboration toward the long-term vision of building fire-safe and fire-resilient communities.

II. METHODOLOGY

This study employed an exploratory sequential mixed methods design, beginning with qualitative exploration followed by quantitative validation. This approach enabled the researcher to first capture the lived experiences, perceptions, and implementation challenges encountered by BFP personnel, and subsequently develop and statistically test a context-specific measurement instrument for Oplan Ligtas na Pamayanan (OLP). The design ensured that quantitative constructs were grounded in empirical qualitative insights and aligned with the operational realities of OLP implementation in Batangas City.

Six (6) key informants were selected using purposive sampling, targeting BFP personnel with substantial involvement in the implementation of OLP activities, including OLP Monitors, Bumbero sa Barangay, and officers overseeing operations, logistics, and community education. Their years of service ranged from 3 to 17 years, and all possessed direct knowledge of ground-level program execution. Semi-structured Key Informant Interviews (KIs) were conducted using a researcher-developed interview guide validated through expert review. Interviews solicited insights on implementation effectiveness, operational challenges, community engagement, and program outcomes. All interviews were recorded with consent, transcribed verbatim, and treated with strict confidentiality. Qualitative data were analyzed using thematic analysis, involving iterative coding, categorization, and theme development. Themes emerging from KIs—such as risk awareness, operational readiness, stakeholder involvement, and fire prevention strategies—served as the foundation for constructing the quantitative survey instrument.

A total of 356 respondents—barangay officials and community members—were selected from 46 OLP-participating barangays using stratified random sampling to ensure proportional representation. This sample size was computed using the Raosoft calculator with 5% margin of error. A researcher-made questionnaire, developed directly from qualitative themes, was used to quantitatively assess the indicators of OLP effectiveness and perceived challenges. The questionnaire consisted of two parts: 1. Effectiveness indicators (e.g., improved safety, risk awareness, stakeholder involvement), 2. Challenges encountered (e.g., community participation, institutional capacity, operational readiness). A 7-point non-ordinal rating scale was employed, allowing respondents to rate items from 1 = extremely ineffective to 7 = extremely effective, with the option to select decimal values for greater precision. After securing approval from the appropriate authorities, informed consent was obtained from all participants. Surveys were administered face-to-face or online, depending on respondent accessibility. Confidentiality and compliance with the Data Privacy Act of 2012 (RA 10173) were strictly observed. A pilot test was conducted prior to full deployment to refine clarity, reliability, and content validity of the instrument.

III. RESULTS AND DISCUSSIONS

RESULTS

Indicators of OLP Effectiveness

Factor analysis identified five core dimensions of effectiveness derived from 28 quantitative indicators. Improved Safety, Stakeholder Involvement, Operational Readiness, Risk Awareness and Risk Governance. These dimensions originated from seven qualitative themes identified during Key Informant Interviews—such as risk assessment, community engagement, fire prevention strategies, and monitoring functions—which were statistically refined into latent constructs.

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Improved Safety

Respondents rated OLP as Very Effective in enhancing community safety (overall mean = 6.00). The highest-rated item was the increased sense of safety due to OLP activities ($M = 6.08$), followed by perceived effective monitoring by local officials ($M = 6.05$). Although respondents agreed that fire incidents had reduced ($M = 5.91$), this indicator scored slightly lower, suggesting uneven reductions across barangays.

Stakeholder Involvement

Participation in drills (factor loading = 0.791) and involvement in long-term fire safety planning (0.760) emerged as the strongest contributors to stakeholder involvement. Engagement in fire prevention education was also highly loaded (0.733). These findings indicate that community members are more active in organized activities than in open policy dialogues, which had lower loading (0.412).

Operational Readiness

This construct displayed strong internal consistency ($\alpha = 0.915$). Adequate budget allocation (loading = 0.790) and sufficient trained personnel (0.752) were the strongest indicators. However, community awareness programs (0.410) and hazard identification visibility (0.577) were weaker areas, indicating gaps in community-facing operational actions.

Risk Awareness

Respondents demonstrated strong awareness of fire hazards, with high loadings for understanding roles in fire prevention (0.737) and ability to identify hazards (0.650). These results mirror OLP's extensive house-to-house information drives and seminars.

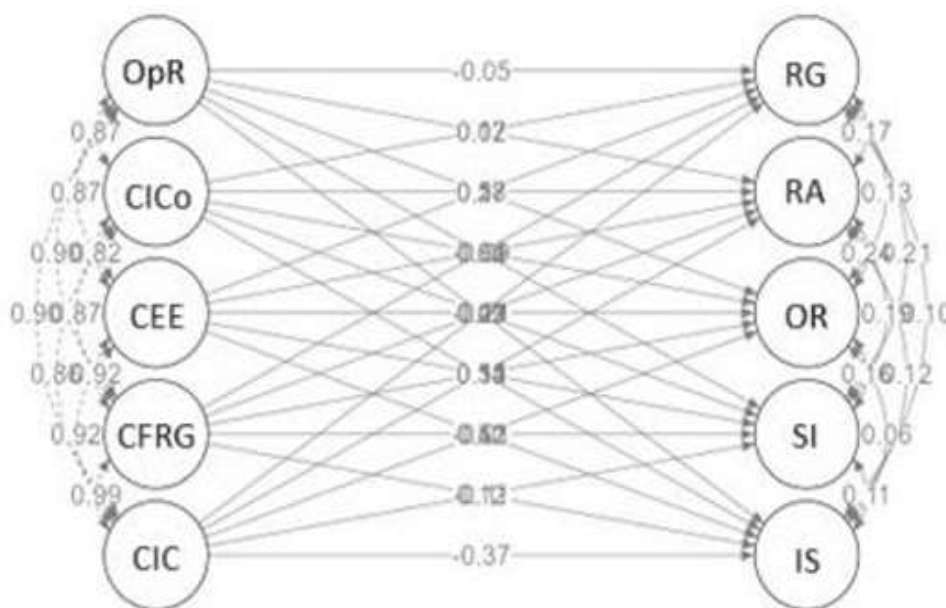
Risk Governance

Risk governance showed moderate factor loadings (0.405–0.535). The strongest indicator was the existence of formal data collection mechanisms (0.535), while continuous training of personnel and long-term planning scored lower, indicating areas needing improvement.

Challenges in OLP Implementation

Five major categories of challenges were identified through qualitative themes and confirmed through factor analysis. Community & Institutional Capacity, Community-based Fire Risk Governance, Community Education & Engagement, Community & Institutional Collaboration and Operational Readiness (constraints). BFP personnel frequently cited poor community participation, lack of resources, training inadequacies, and coordination gaps as recurring issues. These perceptions were mirrored by the community, which rated challenges from Moderate to Great Extent.

Structural Equation Modelling



Path Diagram of the Relationship between Experiences Encountered and Effectiveness of Oplan Ligtas na Pamayanan

Legend

*Challenges Encountered

- Operational Readiness - OpR
- Community & Institutional Collaboration - CICO
- Community Education & Engagement - CEE
- Community-based Fire Risk Governance - CFRG
- Community & Institutional Capacity – CIC

*Indicators of Effectiveness

- Risk Governance - RG
- Risk Awareness - RA
- Operational Readiness - OR
- Stakeholder Involvement – SI
- Improved Safety – IS

Result of Model Fitness Test

Label	X ²	df	P	Decision to Ho		Interpretation	
Baseline Model	2131	35	< .001	Reject		Not Significant	
CFI	TLI	RNI	GFI	adj. GFI		pars. GFI	
1	1	1	1	1		0	
RMSEA 95% CI							
AIC	BIC	adj. BIC	SRMR	RMSEA	Lower	Upper	RMSEA p
3218	3392	3249	0	0	0	0	NaN

SEM analysis revealed the model met acceptable goodness-of-fit thresholds, validating the proposed framework. Significant direct and indirect effects were detected between identified constructs, demonstrating that Operational Readiness strongly predicts Improved Safety. Stakeholder Involvement mediates the relationship between Risk Awareness and Improved Safety. Risk Governance influences all other constructs, indicating its role as a foundational system requirement. These relationships confirm that effectiveness is multi-dimensional and dependent on both behavioral and structural factors.

DISCUSSION

Effectiveness of OLP

Findings indicate that OLP has positively impacted fire safety awareness and response behavior in Batangas City. High ratings for community safety, prompt incident management, and participation in drills reflect strong program reception. These outcomes align with global literature affirming that community-based, participatory fire programs reduce fire risks and improve preparedness. However, the lower assessment for actual fire incident reduction (despite high safety perception) suggests that perceived preparedness may be improving faster than measurable risk outcomes—a known challenge in community risk reduction programs.

Challenges Reflect OLP Implementation Gaps

The challenges identified limited participation, inadequate resources, and weak inter-agency coordination are consistent with national observations of OLP implementation. As shown in KIIs, incomplete risk-vulnerability checklists, fragmented barangay compliance, and low CFAG activation hinder the program's holistic execution.

These issues highlight the need for:

- strengthened barangay-level governance mechanisms
- more consistent LGU support
- improved monitoring and evaluation systems
- sustained community engagement beyond episodic activities

SEM Findings Reinforce the Need for Integrated Capacity Building

SEM revealed strong relationships among structural factors (governance, readiness) and behavioral factors (awareness, involvement). This demonstrates that capacity development cannot focus solely on training or community engagement; rather, it must also strengthen systemic enablers such as:

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- logistical resources
- data-driven monitoring
- governance frameworks

This supports international CBDRR theory, which emphasizes that community resilience results from aligned structural and social capacities.

Implications for Policy and Practice

1. The findings provide empirical evidence that OLP is functioning but not reaching its full potential. Strategic enhancements are required in:
2. Capacity building for personnel and barangay leaders
3. Resource mobilization (equipment, budget, hydrants, manpower)
4. Governance and coordination, especially LGU integration
5. Continuous community engagement, not limited to drills or assemblies

The validated framework further offers a structured basis for evaluating and refining OLP implementation at both local and national levels.

IV. CONCLUSIONS AND RECOMMENDATIONS

This study assessed the effectiveness of Oplan Ligtas na Pamayanan (OLP) in Batangas City using an exploratory sequential mixed-methods approach that integrated qualitative insights and quantitative validation. The findings revealed that OLP positively contributes to improved community fire safety, particularly by enhancing risk awareness, participation in fire prevention activities, and readiness during fire-related emergencies. Structural Equation Modeling further confirmed that key dimensions improved safety, stakeholder involvement, operational readiness, risk awareness, and risk governance significantly influence program success.

Despite these strengths, major challenges persist. Limited community participation, resource constraints, inadequate training, and weak coordination remain substantial barriers to achieving full program effectiveness. While residents perceive OLP as beneficial, gaps in implementation such as incomplete risk-vulnerability assessments, insufficient stakeholder engagement, and inconsistent barangay compliance continue to hinder the program's long-term impact. These findings emphasize that sustaining and enhancing OLP requires systematic improvements in both operational capacities and community-driven strategies.

Overall, the study concludes that OLP is effective but under-optimized. Strengthening the program's governance structures, resource integration, and community involvement is essential for maximizing its contribution to fire resilience in Batangas City and potentially other localities in the Philippines.

Recommendations

1. Strengthen Capacity Building for BFP Personnel and Barangay Leaders

- Conduct regular, advanced training on community-based fire risk assessments, hazard mapping, and preparedness drills.
- Institutionalize refresher training for CFAG members to sustain operational readiness.

2. Enhance Community Participation and Engagement

- Develop culturally relevant and barangay-specific IEC materials to increase awareness.
- Implement continuous community education programs beyond annual events to maintain sustained engagement.

3. Improve Resource Mobilization and Operational Support

- Advocate for increased LGU budget allocation to support equipment procurement, fire hydrant installation, and logistical needs.
- Standardize barangay-level resource requirements for OLP to ensure equitable implementation across communities.

4. Strengthen Governance, Monitoring, and Evaluation Mechanisms

- Establish a unified monitoring system for risk-vulnerability checklists, CFPP progress, and barangay compliance.
- Integrate feedback loops that allow barangays, residents, and BFP personnel to report implementation gaps and suggest improvements.

5. Promote Inter-agency and Community–Institutional Collaboration

- Encourage more formalized partnerships between BFP, barangays, LGUs, and local civil society groups.
- Create barangay-level OLP committees to ensure shared ownership and accountability.

6. Support Long-term Sustainability of Fire Prevention Programs

- Institutionalize OLP into local development plans to secure continuous political and financial support.
- Expand community volunteer programs and incentivize barangays that demonstrate exemplary compliance and innovation.

REFERENCES

- 1) Adebayo, P., Adewale, A., & Oke, L. (2018). Resource limitations and public safety programs in the public sector: A case study of Nigeria's emergency management. *International Journal of Public Safety*, 45(2), 91–104. <https://doi.org/10.1016/j.ijps.2018.02.007>
- 2) Agus Salim, N. A., Salleh, N. M., Jaafar, M., Sulieman, M. Z., Ulang, N. M., & Ebekozi, A. (2023). Fire safety management in public health-care buildings: issues and possible solutions. *Journal of Facilities Management*, 21(1), 69–83.
- 3) Akhtar, S., Joy, A. R., Suchi, S. A., & Hossain, M. (2021). Preparedness planning and management: A literature review emergency fire. *Teikyo Medical Journal*, 44(5), 1897–1921.
- 4) Alvarez, R., Mendez, A., & Tiongco, G. (2020). Fire safety in the Philippines: Aligning fire safety programs with local community needs. *Journal of Fire Safety Studies*, 35(1), 72–81. <https://doi.org/10.1016/j.jfss.2020.01.001>
- 5) Ascoli, D., Plana, E., Oggioni, S. D., Tomao, A., Colanico, M., Corona, P., ... & Barbati, A. (2023). Fire-smart solutions for sustainable wildfire risk prevention: Bottom-up initiatives meet top-down policies under EU green deal. *International Journal of Disaster Risk Reduction*, 92, 103715.
- 6) Ba, A. (2021). How to measure monitoring and evaluation system effectiveness? *African Evaluation Journal*, 9(1), 953.
- 7) Bilotta, E., Palma, L., Cascini, L., Ricci, S., & Caliendo, C. (2016). Structural fire safety assessment in existing steel structures with intumescent coating. *Engineering Structures*, 45(4), 235–247.
- 8) Choi, et al. (2020). Fire safety performance evaluation of existing high-rise buildings. *Journal of Fire Protection Engineering*, 29(3), 145–160.
- 9) Kiran, et al. (2024). Fire service coverage and risk assessment in Kathmandu Metropolitan City. *International Journal of Urban Safety*, 18(1), 55–70.
- 10) Creswell, J. W., & Plano Clark, V. L. (2020). *Designing and conducting mixed methods research* (3rd ed.). Sage Publications.



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