Feasibility Study of Anticipatory Action Project

Country: Indonesia

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List of Abbreviations

AA : Anticipatory Action
BMKG : Badan Meteorologi, Klimatologi dan Geofisika/ Meteorological, Climatological and Geophysical Agency
BNPB : Badan Nasional Penanggulangan Bencana / National Disaster Management Authority
BPBD : Badan Penanggulangan Bencana Daerah / Local Disaster Management Agency
BPS : Badan Pusat Statistik / Central Agency On Statistics
BTT : Biaya Tidak Terduga / Unexpected Expenditure
CVA : Climate Vulnerability Analysis
CVP : Cash and Voucher Programming
DAS : Daerah Aliran Sungai / Drainage Basin
DIBI : Data Informasi Bencana Indonesia / Indonesian Disaster Information Data
DoAJ : Directory of Open Access Journal
DSP : Dana Siap Pakai / On-call budget
DRR : Disaster Risk Reduction
EWS : Early Warning System
FBEA : Forecast-based Early Action
FGD : Focus Group Discussion
FSP : Financial Service Providers
GBV : Gender Based Violence
GESI : Gender Equality and Social Inclusion
GIS : Geographic Information System
HEA : Household Economy Approach
IFRC : International Federation of Red Cross and Red Crescent Societies
KII : Key Informant Interview
KM : Knowledge Management
KRB : Kajian Risiko Bencana / Disaster Risk Assessment
PRBBK : Pengurangan Risiko Bencana Berbasis Komunitas / Community Based Disaster Risk Management
PWD : Person with Disabilities
RPB : Rencana Penanggulangan Bencana / Disaster Management Planning

RT	: Rukun Tetangga (neighborhood association)
RW	: Rukun Warga (a group of several neighborhood associations)
SLR	: Systematic Literature Review
SWOT	: Strengths, Weaknesses, Opportunities, and Threats

Executive summary

The Feasibility Study on Forecast Based Early Action (FBEA) in East Jakarta and Alor (this study) is a part of Wahana Visi Indonesia (WVI)'s effort within the Asia Pacific Anticipatory Action for Disaster Mitigation (ANTICIPATION) Project scheme. The overall objective of the ANTICIPATION Project is to enhance inclusive and gender-responsive forecast-based early action for effective disaster preparedness in East Jakarta, Special Capital Region of (DKI) Jakarta and Alor District, East Nusa Tenggara (NTT) Province, by strengthening awareness, capacity, and resilience of local communities and actors, and engaging them in policy dialogue through evidence-based advocacy. Despite past and current operations and the potential for FBEA in both locations, a comprehensive action plan to include FBEA as a mainstream disaster management strategy is non-existent. Accordingly, a feasibility study on FBEA in East Jakarta and Alor is necessary to support further implementing the FBEA responsive mechanism on floods and cyclones.

This study aims to identify the challenges and gaps in disaster risk reduction and improve household and community early actions based on forecasts while considering gender-based violence (GBV), gender power relations, child protection, and access for people with disability. The feasibility study also incorporates the project plan to disburse cash and voucher assistance as part of the Anticipatory Action (AA). This study is primarily a qualitative one complemented by select quantitative analysis, which optimizes both primary and secondary data sources collected throughout the study. As part of the study, household surveys and Key Informant Interviews (KIIs) with local stakeholders and non-governmental organizations in both sites were conducted. A discussion with the WVI as the implementor of the FBEA project was also implemented, to better understand their capacities and perceptions towards early warning and early actions. The secondary data sources are based on policy review and literature review to capture the past and current knowledge landscape on Forecast-based Early Action and Cash and Voucher Programming in Indonesia, particularly Jakarta and Alor, stored in CARI! Search engine and peer-reviewed articles databases.

By adopting the 2023 Red Cross' Forecast-based Financing Feasibility Manual to examine the capacity level of early warnings and early actions in both locations, this study looks at several indicators that could determine the extent of the possibility of FBEA implementation in both sites, which are:

1. Availability and quality of hazard forecasting and early warning.
2. Risk perception and possibility of early actions according to communities and stakeholders: past, present, and outlook.
3. Institutional capacities and processes.
4. Financing capabilities of communities, WVI, and relevant stakeholders.
5. Availability, access, and quality of social protection.

Qualitative and quantitative evidence and findings are then organized to answer the viability criteria on each indicator. This study subsequently highlights two main conclusions: (1) Jakarta, with a specific focus on Kampung Melayu village, poses medium-to-high viability for FBEA programming against flood risk; and (2) Alor Regency, with case studies of Melaipea and Welai Selatan villages, has low viability for immediate FBEA implementation against tropical cyclone hazard risk and would require substantial preparatory programs and investments to enable a successful FBEA implementation. The level of viability subsequently informs the development of the recommended actions for preparing FBEA in East Jakarta and Alor. There are four types of actions recommended: 1) imperative action to the success of an FBEA project, 2) strongly suggested actions in order to have a successful FBEA programming, 3) desired actions that are important to the design of a robust FBEA program, and 4) actions for future considerations that are not crucial at present, but may support to inform future decisions.

With frequent floods due to its location and extreme rainfall, Kampung Melayu, Jakarta, has existing hazard forecasting and early warnings provided by the local government and part of the community initiatives. Nevertheless, there remains room to improve the quality of analysis with additional critical information, such as volume/intensity of rainfall, to give ample time for releasing early warnings in a coherent timeframe, as the existing forecasting mainly relies on the water level in the floodgates. Regarding risk perceptions and early actions, in general, local stakeholders and communities are aware that Kampung Melayu is prone to floods and thus has exposure to disaster preparedness training/activities. Furthermore, the marginalized and disabled communities, including children, can access the early warnings independently, and the awareness is not built upon their experiences in the past. Some schools are also reported to have mainstreamed disaster preparedness into the curriculum. Furthermore, markets and financial providers are available and have done the Cash Voucher programme in the past, which lessons learned can be used to enhance future FBEA programming.

Table 1 Recommendations for FBEA Programming in East Jakarta

Action Type 1	**Imperative to the success of the project** a. Micro-level hydrometeorological and hydrological modeling to enhance existing risk assessment and strengthen probabilistic scenario for ensuring FBEA trigger and potential caseload of beneficiaries of EA in Kampung Melayu. b. Table-top exercise with all key actors, including BNPB, BPBD, BMKG, community leaders, and potential FSPs, to test out trigger and agreed in the no-regret parameters of the FBEA, including decision on the maximum financial coverage could be disbursed by WVI per individual or households in the event of future disaster forecast c. Community meeting to socialize in advance WVI's beneficiaries' criteria for FBEA in the near future and to solicit feedbacks from the community as well as to encourage non-beneficiaries and local government to prepare for complementary actions
Action Type 2	**Strongly suggested in order to have a successful FBEA programming** a. Explore and tap into the current advancement of InaSAFE, BMKG's Signature, Katulampa Dam River monitoring, and BPBD Jakarta's dashboard for strengthening the SOPs at community level for early actions. b. Annual updates of flood contingency plan that covers multiple scenario and return periods c. Annual updates and co-design of FBEA through CVP with potential FSP, including Duit Hape, Pos, as well as other potential providers
Action Type 3	**Desired actions that are important to the design of a robust FBEA program** - however, even without these actions the FBEA program/project can be implemented a. Develop a feedback loop and grievance mechanism from the communities upon participating / benefitting from the WVI's or any other actors' FBEA program b. Encourage BPBD and other humanitarian actors to prepare a similar, yet complementary, FBEA in sectors other than covered by WVI's CVP or in other villages, to ensure coverage in the event of disasters c. Annual drills and exercises, leveraging on the National Disaster Preparedness Day or other community commemorative days
Action Type 4	**Future considerations that are not crucial at present, but may support to inform future decisions** a. Keeping abreast to the penetration of flood insurance or other risk transfer products available for people or businesses in Kampung Melayu b. Updating flood risk assessment scenario upon completion of recent flood embankment by *Kemenpupera* c. Updating flood risk assessment scenario in Kampung Melayu should there be any new construction of major infrastructure projects.

On the other hand, despite several cyclone events in the past, Alor Regency, specifically Melaipea and Welai Selatan villages, has minimal early warning systems and infrastructure for a tropical cyclone with a limited understanding of early actions for a tropical cyclone. The lack is apparent in all layers of local government down to the communities. Hazard forecasting and early warning must be enhanced, specifically regarding infrastructure, frontier analysis, and dissemination. The early warnings are limited to the extent of WhatsApp groups and local wisdom manifested through *kentongan* and observing the weather. Therefore, the current state of early warnings in both villages is not inclusive, which will allow the marginalized and disabled communities to access the information independently. Communities in these villages have become more vulnerable due to socio-economic conditions and their geographic location as land-locked villages with hilly contours. Furthermore, the study found very minimum DRR programs from both government and NGOs, including least meaningful and concrete early actions were observed among the local stakeholders and communities. In general, assistance in the form of cash or goods is distributed once a disaster occurs, even though early warnings have been issued. Therefore, FBEA programming is rather an opportunity to increase awareness of disaster risk reduction in the Alor Regency. The following are the specific recommendations for FBEA Programming in the Alor Regency:

Table 2 Recommendations for FBEA Programming in Alor Regency

Action Type 1	**Imperative to the success of the project** a. Updating micro and meso-level risk assessment, especially for target hazard of FBEA programming, i.e., tropical cyclone b. Increasing awareness of disaster risk and early warning at the community/village level through regular capacity building/socialization/simulation. c. Increasing awareness of FBEA including the advocacy of the utilization of state budget and coordination among the local government (OPD). d. Explore market readiness and adjust coverage, type, and quantity of CVP of FBEA program in Alor Regency. e. Creating local early warnings at the village level with the communities that can be inclusive of the marginalized groups, such as disabled people, elderly, and children. f. Developing a local early warning infrastructure through an automatic weather station installed in the village or a simple rain gauge operated by the community.
Action Type 2	**Strongly suggested in order to have a successful FBEA programming**

	a. Fostering the capabilities of BMKG's early warnings, particularly in terms of advance analysis and information of dissemination to OPDs and communities, from national down to local level. b. Fostering the capabilities of BPBD Alor Regency, particularly enhancing the role of EOC, to excel impact analysis and early actions, including to utilize tools external to the BPBD and BMKG c. Initiating a working group with PMI or local stakeholders to champion FbEA programmes through knowledge exchange, resource sharing, etc. d. Conducting social and vulnerability analysis/mapping.
Action Type 3	**Desired actions that are important to the design of a robust FBEA program** - however, even without these actions the FBEA program/project can be implemented a. Creating potential hazard signs particularly risk map, hazard map, evacuation sites/routes, and vulnerability map, including socialisation to the communities and head of villages. b. Creating a sister village system for evacuation or creating new supplies for markets to be used by potentially affected villages c. Creating market opportunities in Alor Regency to ensure the readiness of supply-demand. d. Revisit and enhance documents and SOPs to include lessons learned of the 2021 Seroja and FBEA principles, such as KRB Alor Regency e. Conducting regular simulation exercise for cyclone hazard involving OPDs, heads of villages, and communities to test the early warnings and early actions f. Developing a feedback loop and grievance mechanism from the communities upon participating / benefitting from the WVI's or any other actors' FBEA program g. Encouraging BPBD and other humanitarian actors to prepare a similar, yet complementary, FBEA in sectors other than covered by WVI's CVP or in other villages, to ensure coverage in the event of disasters h. Annual drills and exercises, leveraging on the National Disaster Preparedness Day or other community commemorative days
Action Type 4	**Future considerations that are not crucial at present, but may support to inform future decisions** a. Initiating an alliance of non-government organizations that run similar programme or related to disaster risk reduction programme to leverage the disaster awareness programme b. Increasing awareness of private sectors to boost markets and access to and from Alor

1. Background and objectives

The *Wahana Visi Indonesia* (WVI) is one of the proponents of the project "ANTICIPATION - ADH Asia Pacific Anticipatory Action for Disaster Mitigation" to enhance inclusive and gender-responsive forecast-based early action for effective disaster preparedness in East Jakarta, Special Capital Region of Jakarta (DKI) and Alor District, East Nusa Tenggara (NTT) Province, by strengthening awareness, capacity, and resilience of local communities and actors, and engaging them in policy dialogue through evidence-based advocacy. The principal objective of the project will be achieved by strengthening the awareness, capacity, and resilience of local communities and actors, supporting them to operationalize existing frameworks and guidelines into contextualized standard operating procedures (SOPs) and Anticipatory Action (AA) for flooding in East Jakarta and drought in Alor.

The ANTICIPATION Project has two targets: (1) Strengthening the capacity of local authorities and communities, and demonstrating a gender and disability-inclusive forecast-based early action responsive mechanism for floods and cyclones; (2) Ensuring that the Governments of Jakarta and Alor are aware of the benefits, and are taking action to adopt and coordinate efforts within forecast-based early actions and rapid response at the sub-national level.

In detail, this feasibility study investigated communities in two provinces: 1) Kampung Melayu Village, East Jakarta, DKI Jakarta; 2) Alor District, NTT Province. Based on data from InaRISK of the National Agency for Disaster Management (BNPB), the East Jakarta area, especially Kampung Melayu Village, has a moderate to high flood risk index. Disaster data from BNPB shows that 24 flood events occurred in East Jakarta in 2020-2021, which caused suffering to thousands of people. Meanwhile, Alor Regency is also one of the areas affected by the Seroja tropical cyclone which occurred in April 2021. The Tropical Cyclone Seroja caused loss of lives, damages, and affected thousands of people.

Forecast-based early action is the action taken in the short term after the issuance of science-based early warning but before a potential disaster materializes[1] (See Figure 1 below). It also means taking action before a disaster occurs based on early warnings or forecasts to protect and provide earlier support to at-risk communities. Nevertheless, even though forecasting and

[1] Coughlan de Perez et al., 2015. Forecast-based financing: an approach for catalyzing humanitarian action based on extreme weather and climate forecasts, https://www.researchgate.net/publication/277609172_Forecast-based_financing_An_approach_for_catalyzing_humanitarian_action_based_on_extreme_weather_and_climate_forecasts

communication of early warnings have improved significantly in recent years, action based on those warnings has not kept pace[2]. Accordingly, a feasibility study on FBEA in East Jakarta and Alor is necessary to serve as a basis for further implementation of the FBEA responsive mechanism on floods and cyclones.

Figure 1 Visualization of Forecast-based Early Action (Perez et al., 2015)

This study aims to identify the challenges and gaps in disaster risk reduction and improve household and community early actions based on forecasts, while considering gender-based violence (GBV), gender power, child protection, and access for people with special needs. The feasibility study also incorporated the project plans to disburse cash and voucher assistance as part of the AA in this program. Accordingly, the study identifies the existing implementation of anticipator actions based on forecasting for floods and cyclones. It identifies the list of early actions for different community groups, including community-level and household-level actions and subsequently explores the AA that could be non-cash and cash grants disbursement, with a specific focus on exploring value and challenges to cash and voucher programming (CVP) for potentially affected households.

[2] Wilkinson et al., 2018. Forecasting hazards, averting disasters: implementing forecast-based early action at scale, https://odi.org/en/publications/forecasting-hazards-averting-disasters-implementing-forecast-based-early-action-at-scale/

2. Approach and methodology

2.1 Approach and analytical methods

CARI! team employs the following principles in all our works, which we believe fits this project: 1) not reinventing the wheel; 2) scientifically and conceptually sound; 3) co-creation; and 4) pragmatically implementable. Pursuant to the standard basic package of CARI! support, the following services have been provided throughout the project duration.

1) A study powered by machine-assisted knowledge management tools deployed at the main platform of CARI! (https://knowledge.caribencana.id/). CARI! received an award-winning platform providing a spatial-based portal enabling access to risk and resilience analytics, and insights based on scientifically proven and published research. The features of CARI! include a combination of scientometric, machine-assisted search engines that constantly source disaster-related research from global scientific databases (e.g., Scopus and DoAJ), instant area brief, and location-based search-engine tailoring research products to the at-risk area in Indonesia. This will reinforce the scope of documents being analyzed and synthesized in this project.

2) CARI! has extensive experience in developing and applying methodological approaches, including quantitative and qualitative elements, to carry out a study using several combined evaluation techniques, including participatory evaluation methods for data collection and analysis. Personnel offered by CARI! have hands-on experience developing various knowledge management systems, and the team consists of diverse backgrounds. This will ensure that the development of the study will align with this project's objectives.

3) CARI! has conducted similar projects that involve multi-stakeholder collaborations in multiple sectors, such as disaster risk reduction, climate change, education, health, and environment subject matter. (Please see the relevant past projects attachment for a detailed list)

4) A study works that fulfill the four spectra of knowledge management (KM) practices: people-oriented KM, process-oriented KM, technology-oriented KM, and goal-oriented KM[3]

To meet the objectives, the study uses a methodology that includes both qualitative and quantitative methods, and utilizes both primary and secondary data sources. The study team had ensured the engagement enables a participative, inclusive, and child-friendly method and is considering using other methods as well. The table below is a matrix showing the specific tasks, approach and analysis implemented, and main data/information utilized during the study duration.

Table 3 Matrix demonstrating the specific task, methodology/approach, and data/information utilized

No	Specific Tasks (from TOR)	Proposed Methodology / Approach	Data/Information Requirements
1	Reviewing early warning status including defining types of forecasts (for example periodic forecast, forecast with trigger thresholds), and forecast mechanism with specific content of forecast to the community. It needs to identify the current context and gaps for community people to access and understand forecasting information, which is the fastest forecast mechanism to notify households.	✓ Desk Study and Literature Review (SLR) ✓ Survey, Key Informant Interviews, or Focus Group Discussions	Relevant reports on existing activities pertaining forecast-based early actions and emergency response, if any.
2	Reviewing and identifying existing and potential early actions based on forecasting for floods and cyclones. What are the advantages and challenges of existing early actions, analysis of the motivations and barriers to community people taking early actions more effectively including COVID-19 impacts to community early action.	✓ Desk Study and Systematic Literature Review (SLR) ✓ Survey, Key Informant Interviews, or Focus Group Discussions	Relevant reports on existing activities pertaining forecast-based early actions and emergency response, if any.
3	Studying and verifying the list of early actions for early warning and preparing to cope with impacts and minimizing losses of floods in Jakarta and cyclone in Alor at community-level and household-level at different time-lapses.	✓ Desk Study and Literature Review (SLR) ✓ Survey, Key Informant Interviews, or Focus Group Discussions	Relevant reports on existing activities pertaining forecast-based early actions and emergency response, if any.

[3] See the work of Nonaka et al, 1995; Andreev et al, 2017; Shujahat et al, 2019; Oktari et al, 2020 as well as Dr. Bisri's sessions on knowledge management: https://bit.ly/34A9Lgt and https://bit.ly/3pankLs (from 01:23:00).

No	Specific Tasks (from TOR)	Proposed Methodology / Approach	Data/Information Requirements
	1. At the beginning of the flood or cyclone season 2. Upon the regular warning/forecast 3. Upon the warning of extreme events (2 days to 12 hours before floods and 2-3 days before cyclone)	✓ Adaptation to FbF Viability Criteria compliance ✓ Cost and benefit analysis or Household Economic Analysis	
4	The above three categories of early actions should indicate what can be done within HH and community resources, what is beyond, and cost estimation. The focus of external support is applied to categories 2 and 3. Analysis and developing criteria to select vulnerable households participating in the trial of trigger warning thresholds for floods (Jakarta) and cyclone (Alor) (families who will receive early action support from the project/cash grant). Gender analysis, disability, and child protection need to be covered in the feasibility studies to ensure women's participation, youth, persons with disabilities (PWD), or female-headed households being represented in community consultations and preparing for climatic hazards.	✓ Desk Study and Literature Review (SLR) ✓ Survey or Key Stakeholder Interviews ✓ Cost and benefit analysis or Household Economic Analysis	✓ Relevant reports on existing activities pertaining forecast-based early actions and emergency response, if any. ✓ List of WVI's existing partners for onsite activities.
5	Identifying possible impacts of disaster and climate events (floods and droughts, COVID-19) to target communities and their livelihood. Gender analysis on the impact of the crisis on women, girls, boys and men, child protection elements and disability also need to take into account.	✓ Desk Study, Literature Review	✓ Secondary data/research publications/articles
6	Assessing the feasibility of implementing the cash and voucher programming (CVP) for the targeted beneficiaries, including general CVA environment in the country and the acceptance of cash and voucher by the government and the communities; functional and integrated market with adequate stock to absorb increased demand, robust supply chain, and relatively stable price of the commodities;	✓ Qualitative FbF Viability Criteria compliance or SWOT Analysis ✓ Desk Study, Literature Review & Knowledge Networks on CVP	✓ Relevant reports on existing activities pertaining forecast-based early actions and emergency response, if any. ✓ List of WVI's existing partners

No	Specific Tasks (from TOR)	Proposed Methodology / Approach	Data/Information Requirements
	capacity, availability, and willingness of the identified Financial Service Providers (FSPs) to collaborate in the implementation of the planned CVP; favorable security situation in the target areas with appropriate risk assessment in place		for on-site activities.
7	Studying provincial / district / community Natural Disaster Funds to find out the budget resource for taking early actions, including fund disbursement. Possibilities of FBEA integration and alignment to governmental natural disaster programs (related program on disaster risk reduction).	✓ Desk Study and rapid review on FBEA-related matters ✓ Survey or Key Stakeholder Interviews	✓ Relevant reports on existing activities pertaining forecast-based early actions and emergency response, if any. ✓ List of WVI's existing partners for on-site activities.

In addition to the study's specific task and proposed methodology stipulated in Table *3*, during the Study Kick-Off Meeting (21 December 2022) the following key questions / main points are discussed, re-arranged, and will be internalized in the study's data collection instruments and subsequent analytical steps of each case study / site.

1. Is there an impact-based forecast and/or multi-hazards early warning system available?
    a. To what extent does the EWS potentially support FBEA programming?
    b. To what extent is the existence of EWS inclusive of its system design and information dissemination?
    c. Does the area have a decent forecast system with good accuracy? What is the frequency of false alarm rates in that area?
    d. What are the triggers used by the current EWS? Is the impact of the hazards included in the triggers?
    e. What is the communication channel or approach used to communicate EWS to the public? How do GESI groups (women, children and people with disability) receive and understand the EWS?

2. What is the current risk profile of the area? Is there any impact analysis conducted in the area against the existing hazards or included in the risk profile document (i.e., KRB) and/or Disaster Management Plan (i.e., RPB) and/or any disaster preparedness plan in the area developed by the government and local community (e.g., Contingency Plan)?
    a. Has the impact considered the GESI component?
    b. To what extent can it support Anticipatory Action (AA)?
3. What is the current knowledge of the existing Early Action mechanism / programming / initiatives existing and carried out by local government and communities?
    a. What are the existing EA modalities in each disaster management stage? i.e. At the beginning of the flood or cyclone season; Upon the regular warning/forecast; and upon the warning of extreme events (2 days to 12 hours before floods and 2-3 days before cyclone)
    b. To what extent does the following prerequisite for an ideal EA Action Plan exist?
        i. Availability and quality of disaggregated data of the community, including vulnerable groups
        ii. Availability of existing risk information
4. Is there any supporting policy and regulations that could support the implementation / advancement of AA in the study sites?
    a. Is there any existing or potential funding commitment from relevant local government agencies?
    b. Are there any existing or potential government programs that could support AA? Especially in the disaster management, social welfare, and health domain.
5. What is the capacity of government, humanitarian, and development actors in AA? Who are the potential stakeholders for AA in both locations? Is there any AA network/platform/working group functioning in the area?
6. What is the current state of Cash-Voucher Programming and its market viability in both areas?
    a. To what extent is the current CVP accepted by the local government?

b. To what extent is the current CVP accepted by the communities at risk?

c. Based on the recent disasters, does the market function during the emergency?

d. After a disaster or in case of imminent hazard, is there any demand that triggers the use of CVP by the affected communities?

e. Are the communities willing to use the same Financial Service Providers (FSP) for future CVP?

Depending on the findings and evidence from the two study sites in meeting the detailed research questions above, the Study will conclude whether the advancement of FBEA, especially through CVP, is feasible or not? Regardless of the conclusion, the Study will provide a potentially implementable general FBEA Action Plan.

Based on the specific tasks and the updated key research questions, the study will constitute the following activities.

1. **Desk Study and Systematic Literature Review**

   The desk study will mainly draw upon existing metadata, official information, reports, documentation, and other related data produced by Wahana Visi Indonesia. CARI! will undertake the analysis, collect other supporting information, and review building on existing data and information. We will also entail a Systematic Literature Review (SLR) to capture the past and current knowledge landscape on Forecast-based Early Action and Cash and Voucher Programming in Indonesia, particularly Jakarta and Alor. The desk review includes collecting secondary data sources from CARI!'s search engine and peer-reviewed articles databases. SLR is used to appraise and synthesize the state of knowledge from a large body of research publications based on defined questions with a transparent protocol. We will optimize the usage of databases to obtain the publication records (e.g., titles and authors) are scientific publications indexed in the Scopus repository, Directory of Open Access Journal (DoAJ) repository, and Portal Garuda repository. The search for the publication records in the databases will include limiting them within certain relevant parameters (e.g., relevant keywords that describe the study themes (e.g., "Forecast-based Early Action" and "Cash and Voucher Programming"). The initially collected literature will be filtered through several steps of cluster analysis to validate the desired literature criteria by using keyword tagging. Keywords were sought for titles, abstracts, and keywords of scientific publications. At this stage, data extraction from CARI! (https://knowledge.caribencana.id/) will be conducted[4].

2. **Data Collection, including Survey and/or Key Stakeholder Interviews**

   Since the study will be carried out in a participatory manner, CARI! team will identify and meet with key national and local stakeholders in government, CSOs, and civil society to capture their perspectives on the status of the early warning and forecast system, and existing as well as potential forecast-based early actions. The survey or interview will

[4] Free version of CARI! search engine provides a compilation and spatial-based visualization of web- search results of research related to DRR in Indonesia, both at the national and sub-national level. Accessible at: https://caribencana.id/main_portal/. See also Bisri et al, 2020 (pp 80-82), in UNDRR, 2020

also gain information regarding the vulnerable households, possible impacts of disaster and climate events to target communities and their livelihood, the feasibility of implementing CVP, and integration and alignment between National Disaster Fund and governmental DRR program. A list of respondents will be developed in consultation with WVI members during the inception phase.

Key stakeholder interviews, as qualitative data collection, are used to gather in-depth data and information from people who know what is happening in the community. The purpose of the interview is to gather information from a wide variety of people—including community leaders, professionals, or residents—who have direct knowledge of the community. With their specialized knowledge and understanding, these community experts can provide insight into the nature of the problem and provide recommendations for solutions. This approach will be semi-structured in nature and revolves around the action research questions and key findings from the desk review.

In conducting the survey, we consider the COVID-19 safety protocol and design an effective survey that minimizes the number of local people participating in the process and, at the same time, provides an inclusive approach to ensure all groups are represented. Besides that, during the survey and meeting with the local respondent, CARI! will equip the team with personal protection equipment, including medical masks, and hand sanitizer, while referring to the area's COVID-19 status. However, with the given timeline and requirements, we hope that WVI will be able to provide support in coordinating with the relevant stakeholders involved in the current ongoing program.

3. Data Analysis

Data and information that have been provided by Wahana Visi Indonesia and collected through desk study and surveys will then be analyzed using several data analysis processes, including, but not limited to, household-level risk perception and economic capacity analysis.

The Household Economy Approach (HEA) can be defined as a livelihoods-based framework for analyzing how people obtain access to the things they need to survive and prosper. This approach helps to determine people's food and income needs and identify appropriate means of assistance, whether short-term emergency interventions or

longer-term development programs or policy changes. Assessing how livelihoods will be affected by the acute or medium-term economic or ecological change and planning interventions that will support, rather than undermine, their existing survival strategies requires understanding how people usually make ends meet. HEA involves the analysis of the connections between different groups and between different areas, providing a picture of how assets are distributed within a community and who gets what from whom. An analysis of how people in different circumstances get the food and cash they need, their assets, the opportunities open to them and the constraints they face, and the options available to them at times of crisis is a key to HEA.

To test whether any social and economic variables of the household samples, especially on disaster experience, risk perception and economic capacity, have any influence on their appreciation towards early warning information and possibilities to undertake early actions, the Fisher-Exact Test was performed. The Test was selected due to the nature of the sampling method and sample size agreed upon for this study.

4. Feasibility and viability assessment for FBEA

A Feasibility Study (FS) is the first step in establishing an FbF system in a country. Feasibility studies can also inform addressing additional hazards in countries with operational FbF systems. The FS is a rapid collection and assessment of information to make recommendations as to under what conditions FbF is viable in a specific country and to begin exploring different design options for the FbF system, including choice of hazard(s) and risks to address, involved institutions, local buy-in, available forecasts and vulnerability and exposure data, possible actions, and so forth.

The feasibility study results should assess the potential to reduce the impact of extreme weather events through operationalizing the FbF system. The FS report should provide relevant information on institutions with sufficient knowledge and guidance on the basis and existing structures that can be used to establish an FbF system. At the same time, the report should point out challenges and gaps that must be addressed to ensure the system is operational (e.g., no usable forecasts for interest hazards or insufficient

institutional capacity). The report should also provide initial guidance on how the system can be designed to have the highest potential to reduce disaster impacts.

If carried out thoroughly, FS can take up time and resources. Thus, before embarking on the process, the stakeholders should discuss internally whether they are committed to FbF and whether this is a suitable time to devote to FbF. These discussions can be continued based on the results of the feasibility study.

There are 7 steps to starting an FbF program: Step 0: Confirm commitment to FbF; Step 1: Select the person or team to conduct the study; Step 2: Design the study; Step 3: Conduct the initial desk review; Step 4: Collect information; Step 5: Assess viability and make design recommendations and Step 6: Report results. This step is adapted from the newly created Forecast-based Financing Practitioners Manual in consideration of the WVI and disaster management affairs business processes in Indonesia. Given the different contexts of WVI's operation, we adjusted the viability criteria from AnticA (2023), which can be found below.

Table 4 Viability criteria for determining viability of Forecast-based Early Action[5]

Viability criteria (adapted from IFRC, 2023)	**Compliance in Alor / Kampung Melayu / WVI operation national level**	**Evidence in support of the viability criteria compliance**
Ideal viability for a specific hazard		
An impact-based forecast exists for the prioritized hazard		
There is a well-established early warning system or extreme event forecast that has been assessed to have high accuracy.		
There is a strong evidence-base for the short-listed early actions, based on rigorous evaluations.		
There is potential to integrate the FbF trigger model or FbF actions		

Viability criteria for determining viability of Forecast-based Early Action[5] IFRC, 2023, *Red Cross Forecast-based Financing Manual*, Available online: https://manual.forecast-based-financing.org/en/

into established social protection systems.		
The WVI's representatives are thought leaders and able to work closely with technical services, government authorities (e.g. BPBD) and other stakeholders to establish the FbF system.		
The prioritized hazard has been prioritized within the **WVI's strategic plan**		
There is a high level of buy-in within the technical services (hydro, met) for co-producing an FbF trigger model.		
There is a functional FbF working group in **the country / city**		
There is an established system for collecting data on vulnerability and exposure nationally and locally.		
The prioritized hazard has been prioritized within the local government**'s disaster plan** (i.e., RPB)		
Viability criteria (adapted from IFRC, 2023)	**Compliance in Alor / Kampung Melayu / WVI operation national level**	**Evidence in support of the viability criteria compliance**
Medium to high viability for a specific hazard		
There are available forecasts for the prioritized hazards which can be skill-assessed and combined with global sources can provide a sufficiently rigorous basis for the hazard forecast.		
There are meaningful actions that could be taken within the lead time of the forecast for the prioritized hazard.		
The prioritized hazard has high negative impacts on the affected populations, meaning there is a humanitarian imperative to act.		

There is an understanding by WVI's local office and the technical services to establish the system.		
There is commitment to implement early actions (e.g. through or within the protocols or contingency plan) by WVI.		
There is commitment to implement early actions (e.g. through or within the protocols or contingency plan) by corresponding local government and local community leaders.		
There is commitment of relevant stakeholders to evaluating the impact of the FbF system rigorously		
Viability criteria (adapted from IFRC, 2023)	**Compliance in Alor / Kampung Melayu / WVI operation national level**	**Evidence in support of the viability criteria compliance**
Low viability for a specific hazard		
There are financial management concerns such that it would be impossible for the WVI office to access FbA using the core WVI funds *(please suggest term)*.		
There are financial management concerns such that it would be impossible for the local government's OPDs to access FbA using the state-fund (e.g., DSP, BTT, Village Fund).		
There are no forecasts for the prioritized hazard, or no forecasts that have sufficient accuracy at lead times that would allow for meaningful action (e.g. only forecasts with 1-3 hours lead time have sufficient skill).		
The WVI local office does not have the capacity to implement meaningful actions in the lead time of available forecasts		
The BPBD / other local government OPDs do not have the capacity to		

implement meaningful actions in the lead time of available forecasts		
The WVI local office is uninterested in pursuing the development of an FbF system.		
The BPBD / relevant local government OPDs are uninterested in pursuing the development of an FbF system.		
There is no financial service provider available to channel the FbF/FBEA through CVP		
In case of imminent hazard / disasters, market is not functioning, including not ready or have limited stocks to absorb the influx of cash / voucher		

Source : IFRC, 2023, Red Cross Forecast-based Financing Manual

Based on the viability matrix and the level of compliance, we prescribe four types of actions to be considered by WVI to create FBEA through CVP in two cities as well as for potential applications across Indonesia. The four types of actions are categorized in order of priority in consideration of the "demand side" – the findings supported by data from household surveys, KIIs, and content analysis – as well as the "supply side" – the extent of potential FBEA within the business processes of WVI. The four types of actions include the following:

Table 5 Four types of actions to advance FBEA

Action Type 1	Imperative to the success of the project
Action Type 2	Strongly suggested in order to have a successful FBEA programming
Action Type 3	Desired actions that are important to the design of a robust FBEA program, however, even without these actions the FBEA program/project can be implemented
Action Type 4	Future considerations that are not crucial at present, but may support to inform future decisions

Source: IFRC and PMI, 2018, Forecast-based Early Action (FBEA) in Indonesia: A Scoping Study.

2.2 Data collection method and research activities performed

As reported in the inception and interim reports of this study, the following data collection were implemented, namely: 1) secondary data, policy documents, and literature collection and review, 2) key informant interviews, 3) household survey, and 4) field observation.

The research activities were mainly performed in January and February 2023, with research deliberation/discussion and sharing sessions conducted on eventual-basis in March and April 2023.

The 1st Inception Report details the criteria of secondary data, policy documents, and literature collected for this study. Mainly, studies and policies related to disaster management, social welfare, and development planning affairs of the two study areas were collected. A policy checklist matrix was used to guide the researchers in detecting the extent of those documents supporting this study. Please access the following links for the policy checklist of both locations:

- For East Jakarta, https://1drv.ms/x/s!ApURLglhrqulhKdb26546gVPs0WJhg?e=7B4f00
- For Alor, https://1drv.ms/x/s!ApURLglhrqulhKdZyKZLlq3X-Qwi-w?e=5pQ2Aj

The team implemented data collection activities through KIIs, household surveys and field observations in parallel at both locations. In principle, this study's Key Informants Interviews used a combination of purposive and snowball approaches. Furthermore, considering the timeframe and resources allocated to the study, we propose to conduct a small-size non-probabilistic sampling technique in each village, i.e., a small sample of 25-30 respondents. Non-probabilistic sampling is highly driven by site selection, time, and events.[6] A non-probabilistic sampling is also in line with this study's design and objective, which aims to preliminary identify the feasibility of FBEA implementation in the pre-selection areas where WVI operate, i.e., Jakarta and NTT. Furthermore, to ensure the findings meet the project's timeframe, this study will use self-selection sub-sampling supported by the WVI team in all data collection sites. To minimize bias resulting from the chosen sampling plan, a set of criteria is developed and agreed

[6] Corbin, J. & Strauss, A. (2016) *Basic of Qualitative Research: Techniques and Procedures for Developing Grounded Theory (4th edition).* London: Sage Publication.

upon between CARI! and WVI to ensure the representability of views from targeted respondents and locations.

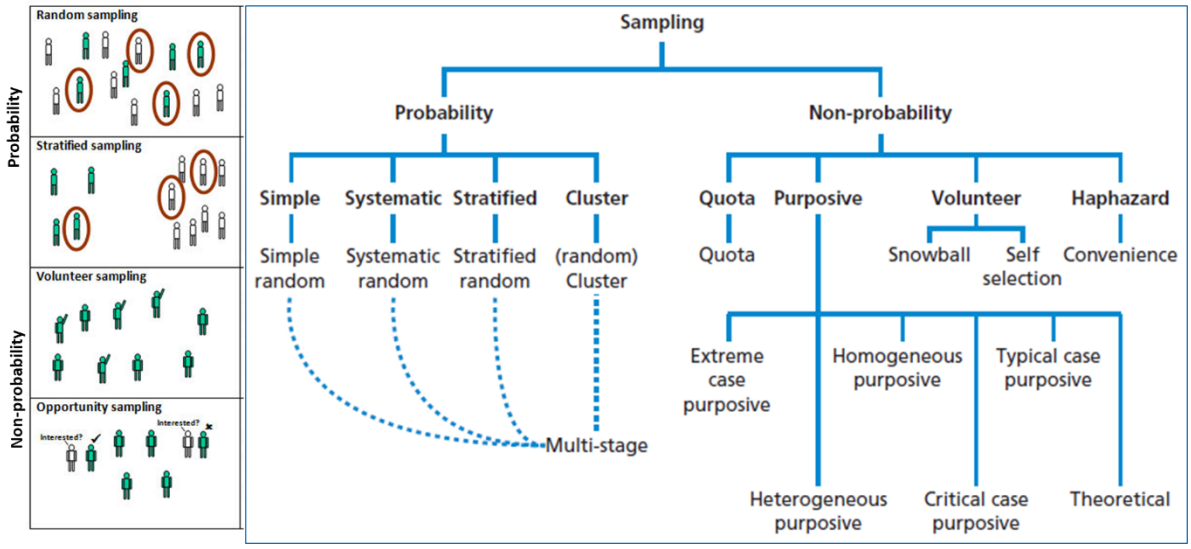

Figure 2 Type of sampling

To use the period of field data collection effectively as stipulated in terms of Reference (TOR) of this study, it is highly recommended to pre-arrange the potential respondents (self-selection) and organize the survey in the community hall. With this strategy, 25-30 respondents can be accommodated daily for a household survey in one dedicated hall, making this approach efficient and requiring fewer human resources than door-to-door surveys.

Data collection activities in Kampung Melayu Village, East Jakarta, were performed intermittently from 14 to 24 January 2023. Several key informants were interviewed, including a representative from the BPBD DKI Jakarta, Social Service DKI Jakarta, Community Health Center, Social Services at the village/district level, Duit Hape (as a sample of past FSP), the head of community groups (RWs), and the operator of Katulampa Dam. 31 household representatives were surveyed, and all six variety criteria were fulfilled.

Data collection activities in Malaipea and Welai SelatanVillages, Alor, were performed intermittently from 16 to 21 January 2023. Several key informants were interviewed, including representatives from the BPBD Alor, Social Service Alor, Health Office Alor, BMKG Alor, Community Health Center, Social Services at the village/district level, community leaders and two NGOs. In addition, 35 household representatives were surveyed in Malaipea and 32 in Welai Selatan villages, with all criteria fulfilled.

The key events conducted during the study duration can be found below.

1. 22 December 2022, pre-kick off meeting with WVI.
2. 4-9 January 2023, contract finalization with WVI
3. 16 January 2023, Inception Report and data collection instrument submission
4. 14-25 January 2023, fieldwork activities in Kampung Melayu, East Jakarta
5. 16-21 January 2023, fieldwork activities in Alor Regency, East NTT
6. 31 January 2023, Interim Report and fieldwork datasets submission
7. 14 February 2023, Feasibility Study progress report submission/draft Final Report
8. 27 February 2023, Review and internal discussion with the WVI team
9. 13 March 2023, Submission of draft Final Report revision
10. 10 April 2023, External sharing session of the Feasibility Study result
11. 18 April 2023, Revision of Final Report submission

3. Literature review on forecast-based early action research in Indonesia

Forecast-based early action, including financing in disaster management and humanitarian activities, is gaining traction. Forecasting information will be optimal if adapted to the context and needs of decision-makers and the operational side of the humanitarian sector. Regardless of the warning accuracy, a specific space in the humanitarian field can be enhanced. Forecast-based action/financing approach and concept is an excellent opportunity to open space for dialogue between forecasters and users. In addition, this approach is helpful to identify better the opportunities and needs of tailoring forecast information[7].

Forecast-based early actions are also not agnostic to the pre-existing vulnerability parameters of an individual and the community. Instead, it can consider the parameters of each activity, such as action lifetime, when verifying a forecast. The forecast also can be linked to activity based on an understanding of the magnitude of the impact of previous catastrophic events and a willingness to act "in vain" for specific actions[8].

Studies related to Forecast-based early action still need to be widely carried out, specifically in Indonesia. From our knowledge engine database, we found two studies that explicitly mention the term Early Action. The two studies are Flood Hazard Mapping Using Gis Spatial Analysis Functions in Baleendah, Bandung, West Java8. However, this study focuses more on the analysis of risk assessment in the Baleendah area but, unfortunately, needs to examine early action specifically. The subsequent study we found was "*Meteorological Services for Forecast-Based Early Actions in Indonesia.*"[9]. This study investigates the feasibility of implementing FBEA in Indonesia, especially concerning floods and drought, as the two most impacted climate-related hazards on human lives and assets.

In terms of conducting a detailed systematic literature review, several keywords would be used for our following crawling process to perform a deeper study on this topic, i.e. Early Action, Forecast Based Early Actions, FBEA, Forecast-based Financing, FbF, action-based forecasting,

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[7] See Coughlan de Perez, E., van den Hurk, B., van Aalst, M. K., Jongman, B., Klose, T., and Suarez, P.: Forecast-based financing: an approach for catalyzing humanitarian action based on extreme weather and climate forecasts, Nat. Hazards Earth Syst. Sci., 15, 895–904, https://doi.org/10.5194/nhess-15-895-2015, 2015.

[8] *Ibid.*

[9] See Perdinan et al. (2020). Meteorological Services for Forecast Based Early Actions in Indonesia. In: Leal Filho, W., Jacob, D. (eds) Handbook of Climate Services. Climate Change Management. Springer, Cham. https://doi.org/10.1007/978-3-030-36875-3_18

Weather Services, Risk-based warning, humanitarian action, forecast triggers, triggered by forecasts, forecasts in decision-making, the value of a forecast, usefulness of a forecast, forecast value, forecast usefulness.

According to CARI! Knowledge Engine portal has 163 research articles found in East Jakarta City, which can be categorized based on the type of hazard. There are three research articles related to earthquakes, 27 related to floods, one to climate change, two to volcanoes, and one to tsunamis. On CARI! Portal Knowledge Engine record, there are no latest publications regarding the Seroja Tropical Cyclone.

Advancement for FBEA critically requires a robust understanding of the state of early warning systems at each locality and the nation. CARI! released an Indonesia Disaster Knowledge Update in April 2022 regarding early warning systems in Indonesia, as can be seen below and accessible here for the dynamic visual https://knowledge.caribencana.id/special_brief/brief-april-22. As can be seen, there is a clear indication that more research regarding EWS is available for Jakarta other than NTT.

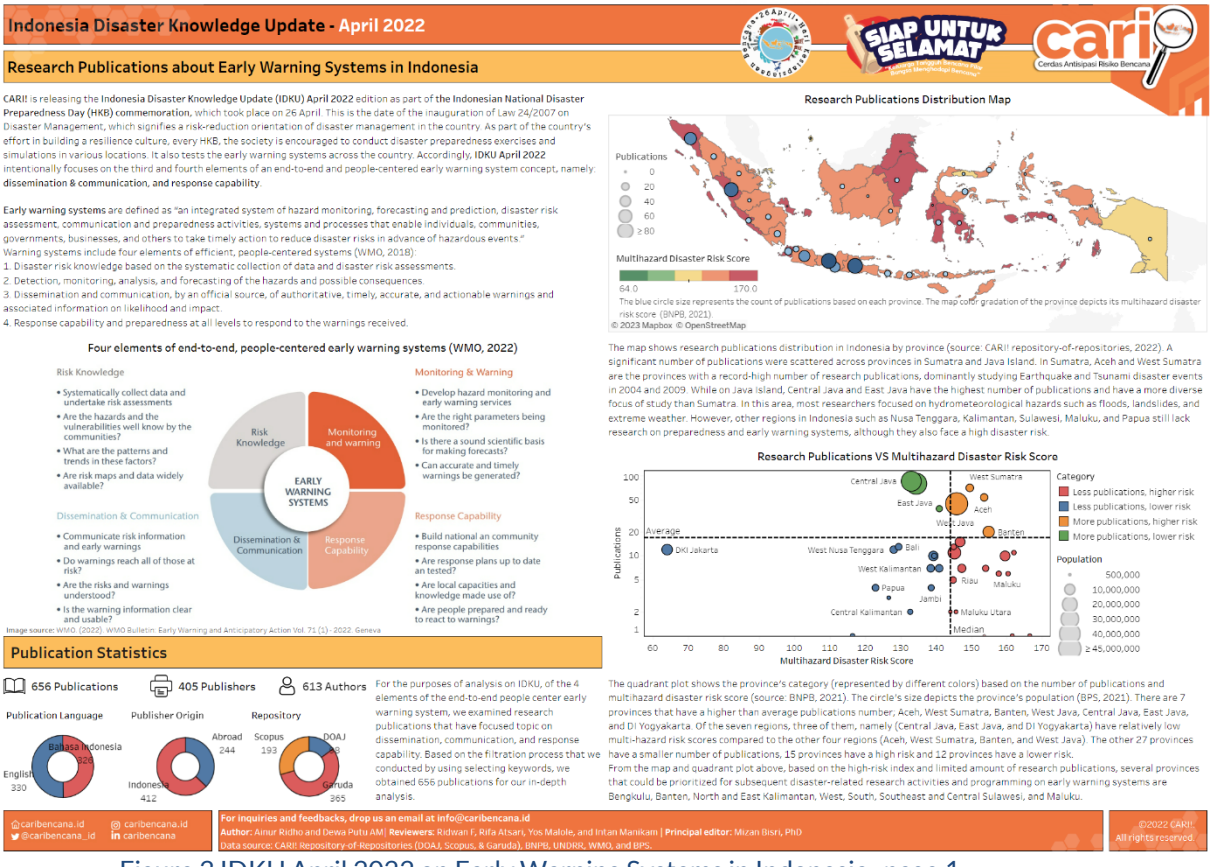


Figure 3 IDKU April 2022 on Early Warning Systems in Indonesia- page 1

See details here: https://knowledge.caribencana.id/special_brief/brief-april-22

The second page of IDKU April 2022 shows that the landscape of research EWS for hydrometeorological hazards is increasing over time compared to other risks, especially flood and flash floods. However, only a little research discussed the state of EWS for wind-related disasters. Nevertheless, as seen from the top investigated cities, most research on EWS in cities exposed to geophysical hazards, such as earthquakes and tsunamis, for example, in Padang, Banda Aceh, or Yogyakarta cities.

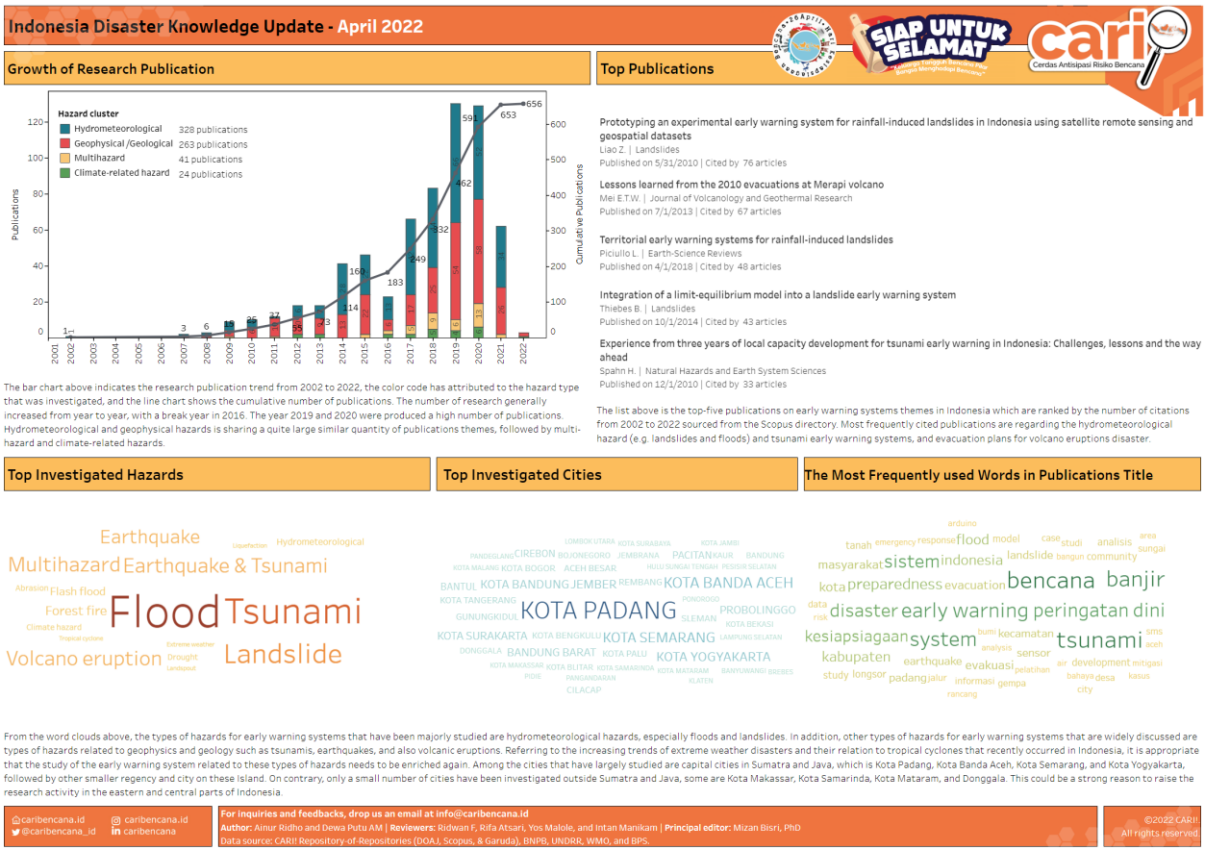


Figure 4 IDKU April 2022 on Early Warning Systems in Indonesia – Page 2

See details here: https://knowledge.caribencana.id/special_brief/brief-april-22

The third page of IDKU April 2022 shows that out of 308 research articles about EWS in Indonesia, only 19 discussed impact-based EWS. We also need a knowledge base that directly ties EWS with contingency plans or evacuation plans. Furthermore, as the regional capacity brief suggests, the number of publications on EWS in Bali and Nusa Tenggara areas is significantly lower than the number of villages.

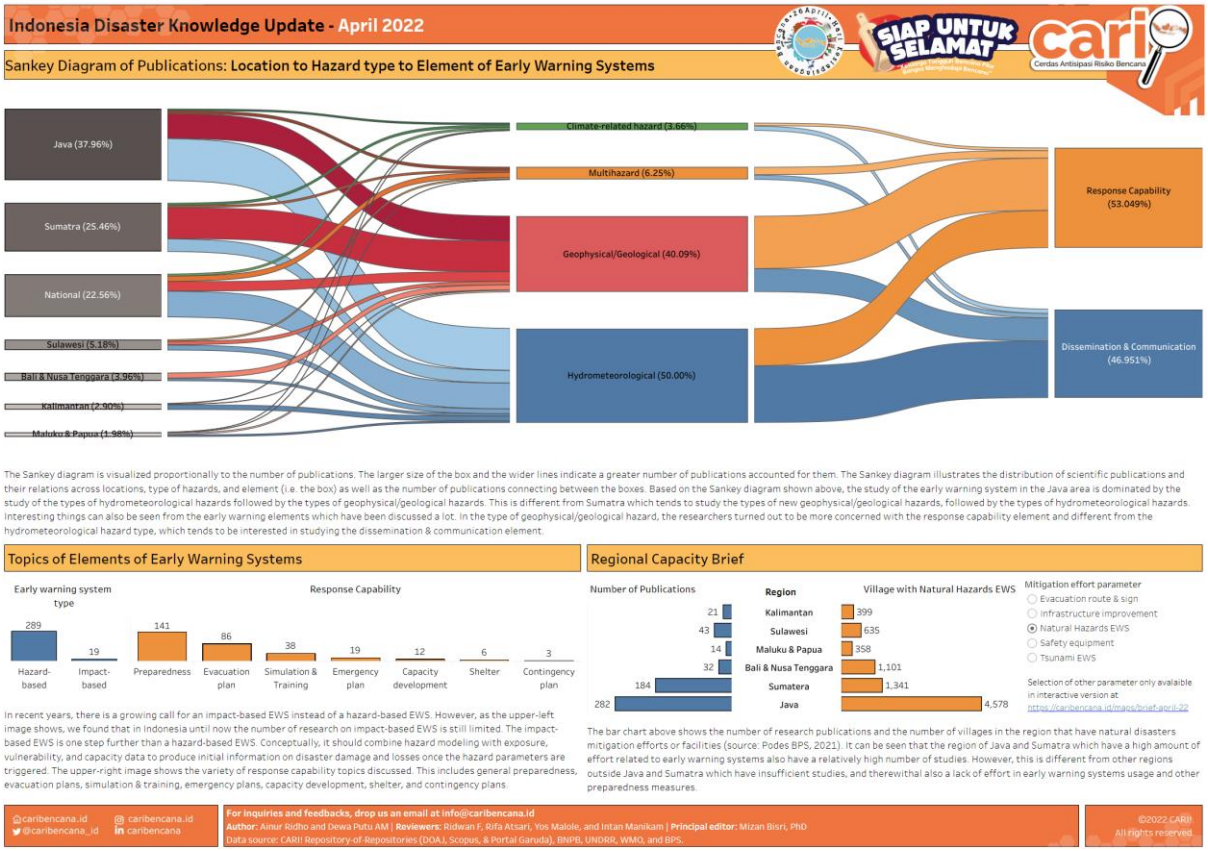


Figure 5 IDKU April 2022 on Early Warning Systems in Indonesia – Page3

See details here: https://knowledge.caribencana.id/special_brief/brief-april-22

4. Case 1 - Feasibility & Viability of FBEA in Kampung Melayu Village, East Jakarta

4.1 Overview and brief risk profile of Kampung Melayu Village, East Jakarta

Flood record in DKI Jakarta and Kampung Melayu

Historically, floods have been a priority for disaster risk management in Jakarta, in general, and the Kampung Melayu village. On an annual basis, the Jakarta Special Region experiences floods to a varying degree. Based on Database *Bencana* Indonesia (DIBI, National Disaster Database), there are 307 records of flood events, constituting 56.96% of all the disasters in the province. Among these, there are six significant flood occurrences that resulted in substantial casualties, i.e., floods in 2002, 2007, 2013, 2015, 2020, and 2021.[10]

Of the six major floods in Greater Jakarta, the 2007 flood was triggered by 344 mm of rainfall and had the most extensive scope of impact. This flood submerged and inundated 955 RWs, causing 48 fatalities and 276,333 people-displaced. Meanwhile, in the 2020 Flood, it was triggered by a 377mm rainfall and inundated 390 RWs and caused 19 fatalities and 36,445 IDPs. More detailed information regarding the impact of the six most significant flood events in Jakarta is explained in figure 6.

[10] See https://metro.tempo.co/read/1646650/ini-10-banjir-terparah-di-jakarta-sepanjang-sejarah

Figure 6 impact of the six most significant flood events in Jakarta

According to respondents in Kampung Melayu Village, although the 2007 Jakarta Flood was the most damaging at the provincial level, it was the 2020 Jakarta Flood, which was perceived as the most devastating for Kampung Melayu villagers. It is corroborated by the statements from KIIs in Kampung Melayu[11]. The statement has also been reinforced by the village official's representative, the Head of the Disaster Management Section of Kampung Melayu Village, who said:

> *"The worst flood was in 2020. It overflowed the area that had been embanked (RW 1, 2 & 3), and the water overflowed the embarkment. The flood occurred because of the continuous local rain and was exacerbated by flood overflow from Bogor. In addition, because the incident happened at night, the community did not have time to save their belongings, so the impact felt great".* [12]

Flood risk in Jakarta, let alone in Kampung Melayu, cannot be separated from the readings of extreme rainfall monitoring and water level readings in five floodgates along the Ciliwung River watershed. Kampung Melayu village is part of the Ciliwung River area, and is located closer to the downstream area. Meanwhile, the Ciliwung River upstream is located across several sub-

[11] See ref. transcripts KII RWs.

[12] See ref. transcripts KII Head of the Disaster Management Section of Kampung Melayu Village

district areas in Bogor Regency, with its main water-level reading located in the Katulampa Dam in Bogor City (see figure below). This reading at Katulampa Dam along with floodgates in Depok and Manggarai, has by far given all the 'physical' information needed for people around Kampung Melayu Village to anticipate floods: the water level reading and vigilant (*Siaga*) warning in each floodgate.

Figure 7 Greater Jakarta map
Source: BRIN[13]

Furthermore, aside from the measurement in Katulampa Dam, the study found that concerned stakeholders also paid attention to rainfall measurements in other locations. Rainfall monitoring in Katulampa Dam may also indicate vigilant status in the Puncak area of Bogor Regency. Personnel in the Depok floodgate also consider rainfall intensity in Bogor City, and in turn, personnel in the Manggarai floodgate monitor rainfall intensity in Depok and South Jakarta (see Figure 7). It is also easier to monitor rainfall intensity in other locations within DKI Jakarta and enable a more localized understanding of the situation.

Given the availability of technical parameters at the time of the most significant floods in DKI Jakarta from 2002 to 2020, the following parameters seem to be consistently available and can potentially be available for FBEA triggers:

1. All the rainfall intensity (RI) monitoring in Puncak, Bogor, Depok, and Jakarta

[13] See http://karya.brin.go.id/id/eprint/12994/

2. Floodgates' water level (WL) in the three most relevant floodgates in Ciliwung River, and

3. Historical flood depth is in Jakarta, especially in Kampung Melayu.

Therefore, the study compiled various technical parameters of past floods as presented in Table 6 below with the data points collected from BPBD DKI Jakarta, Bappenas-published report, BMKG, and reliable media sources from 2022 to 2020. As previously mentioned, East Jakarta's rainfall intensity was the highest in the 2020 flood followed by the 2007 flood. However, compared to other locations, the rainfall intensities from observation have been lower than 150 mm/day, except those in Depok, which can reach 400 mm/day during the 2020 flood.

According to the authorities interviewed, the bold parameters in the table below were suggested as the potential primary considerations for alerting imminent flood risk in Jakarta. Notwithstanding the water flow from the Ciliwung River upstream, extreme rainfall in Jakarta during floods from 2020, 2015, and 2002 may have contributed to the flood magnitude as well. In 2013, rainfall intensity in Bogor and East Jakarta surpassed 100 mm/day when it caused flooding in Kampung Melayu. At the time the water level in the floodgates at Katulampa and Depok surpassed 210 cm. The rainfall intensity and water level were significantly higher in the 2007 flood and so did the highest flood depth measured in Kampung Melayu.

Table 6 The main source of flood in Jakarta

Flood year	**RI Puncak, Bogor Regency**	**WL Bendung Katulampa**	**RI Bogor City**	**WL Floodgate Depok**	**RI Depok City**	**WL Floodgate Manggarai**	**RI East Jakarta**	**Highest Flood Depth in Kp. Melayu**
	mm/day	*cm*	*mm/day*	*cm*	*mm/day*	*cm*	*mm/day*	*m*
2020	60	110	58	150-400	142	915	**377**	3
2015	<50	50	2,4-120	135	~100	120-240	**277**	2
2013	**>100**	210	**110**	230	>100	1030	100	4
2007	**>100**	240	**142,5**	465	~100	1090	**340**	5
2002	>100	120	>100	148	>100	1050	**168**	5

Source: compiled by the author from various sources
Note: 'RI' represents Rainfall Intensity, while 'WL' represents Water Level. Yellow marks the most damaging floods in Kampung Melayu, while red marks the most damaging floods in DKI Jakarta. Bold parameters represent the main source of flood in Jakarta.

The 2002 flood displaced more than 150,000 people in Jakarta and the flood that lasted about six days resulted in 21-32 fatalities in 42 sub-districts covering around 168 km^2 areas (24,25% of DKI Jakarta's areas)[14]. The rainfall intensity at that time, between 28 January and 2 February 2002, was measured more than 100 mm/day. This was despite the reading of rainfall in southeastern Jakarta was quite low on 29 January is considered low, i.e. in around Cisarua, Bogor Regency (red square) ranging between 60 and 90 mm/day. Even so, it caused above-normal river flow to Jakarta. The details can be seen in daily updates from BMKG in figure 8.

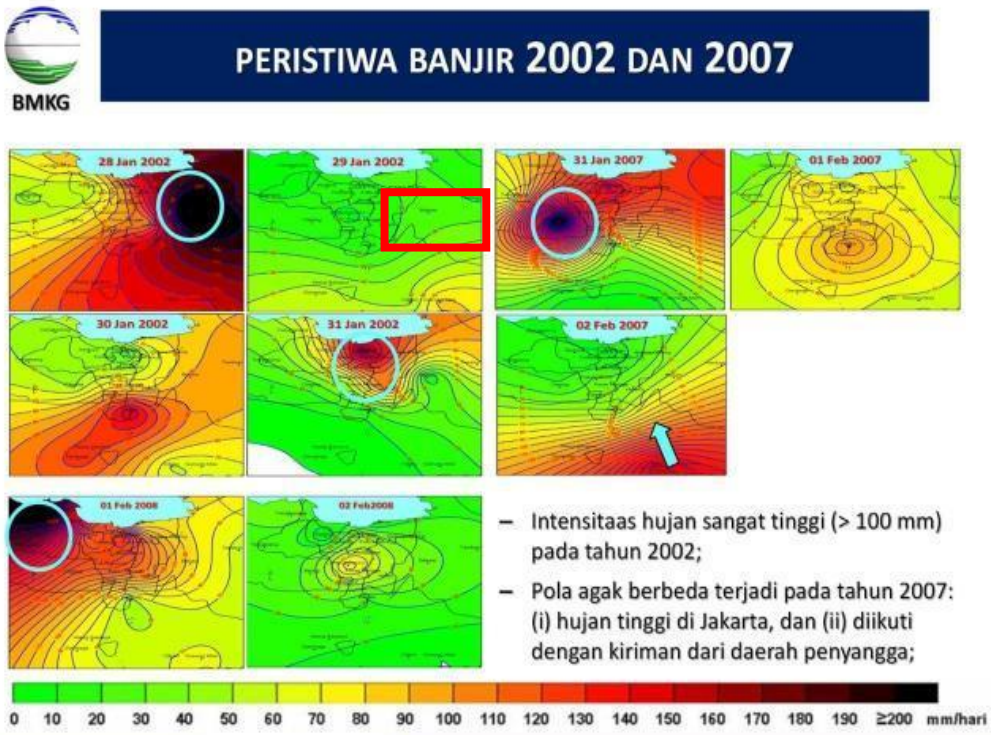


Figure 8 Rainfall intensity of Jakarta Floods in 2002 and 2007.

Red square represents areas around Cisarua, Bogor Regency. Blue area in the map represents Teluk Jakarta and surrounding water areas. Source: BMKG (2007)

Figure 8 provides a comparative perspective between the 2002 flood with the one in 2007. In 2007, the rainfall intensity was constantly higher (>100 mm/day) around the Ciliwung River watershed between 31 January and 2 February. Along with the highest rainfall measured at 340 mm/day intensity in Jakarta, the 2007 flood evidently caused more than 455 sqkm of areas (60% of DKI Jakarta's areas) inundated within over 10 days, resulting in the highest number of

[14] See https://metro.tempo.co/read/1646650/ini-10-banjir-terparah-di-jakarta-sepanjang-sejarah

displacements caused by floods in Jakarta (276.333 people), 48-80 victims (Figure *6*), and costs 4,3 trillion Indonesian Rupiah [15].

The inundation area of the 2013 Flood was smaller compared to the one of 2007 (240 sq km). Even so, DKI Jakarta Province suffered the greatest disaster loss, reported at around 20 trillion IDR, with 1250 evacuation sites erected (the highest in the last decade), more than 90,000 IDPs, and 40 deaths within the one-week flood. As can be seen in the figure below, on average the flood depth in Kampung Melayu was reported to be around 1.5 m and the highest was reported at around 4 m, as shown in Table *6*.

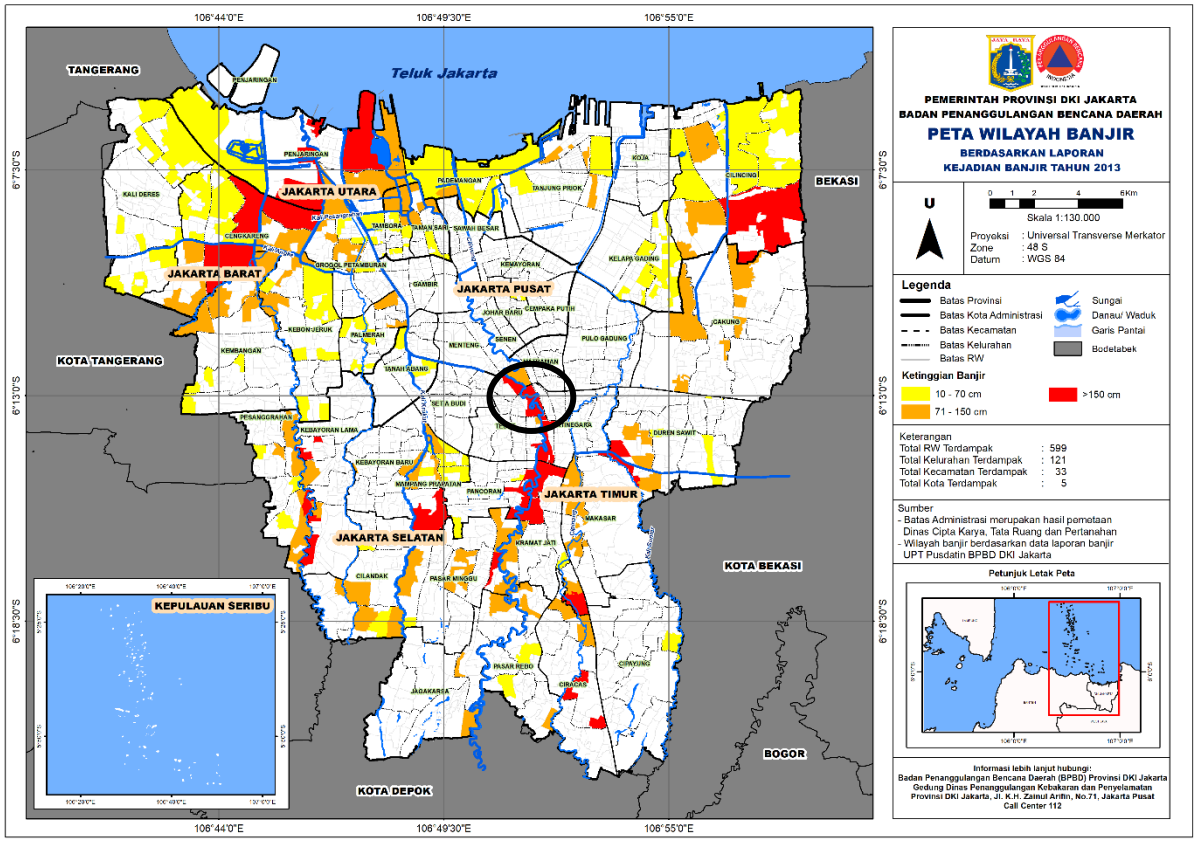


Figure 9 The 2013 flood affected areas.

Location of Kampung Melayu (circled in black).

The 2015 flood lasted for one week, inundated 281 sq km area of Jakarta, and resulted in IDR 1.5 trillion of losses. As can be seen from the figure below, the rainfall intensity reached an extreme level on 10 February 2015, and subsequently triggered floods in Jakarta. The data in Table *6* supported this statement, showing lower upstream rainfall intensity (Puncak, Bogor

[15] See https://metro.tempo.co/read/1646650/ini-10-banjir-terparah-di-jakarta-sepanjang-sejarah

Regency). In Kampung Melayu, the flood ranged between 70-150 cm (Figure *11*), however, due to the village's topography, it reached a maximum of 2m (Table *3*). As can be seen from both Figure *10* and Figure *11*, it was evident that Kampung Melayu was prone to higher levels of flood inundation due to its shape.

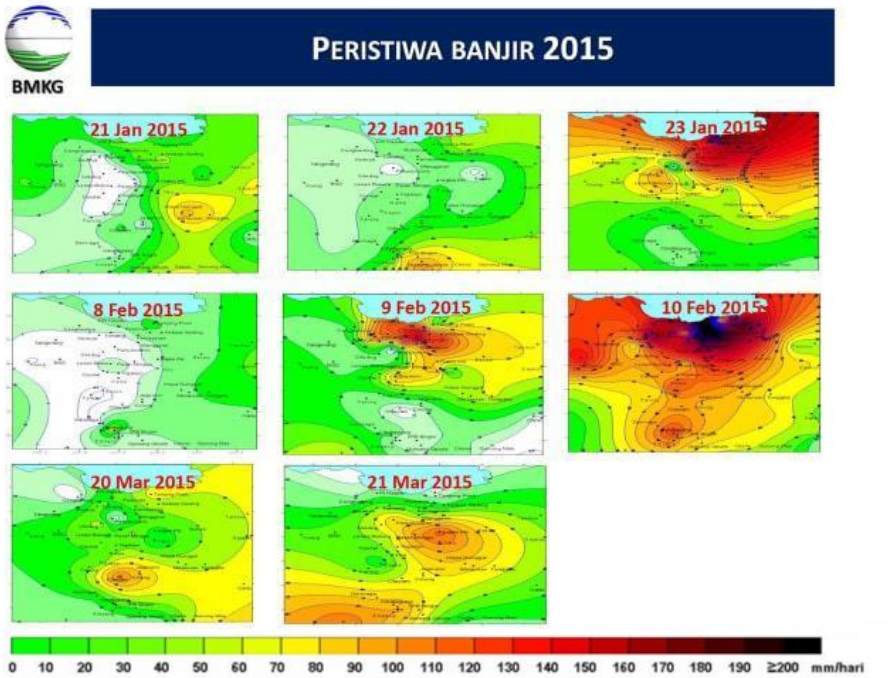


Figure 10 Rainfall Intensity during 2015 flood

Blue area in the map represents Teluk Jakarta and surrounding water areas.
Source: BMKG observation.

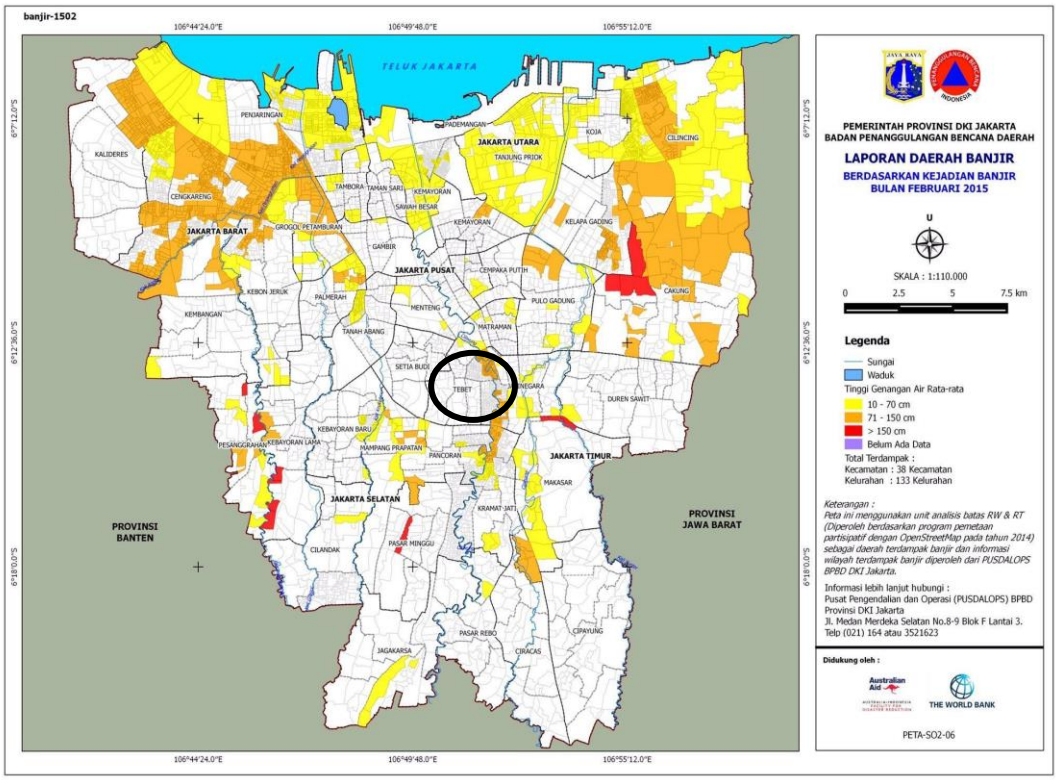


Figure 11 The 2015 flood affected areas

Location of Kampung Melayu (circled in black). Source: BPBD DKI Jakarta.

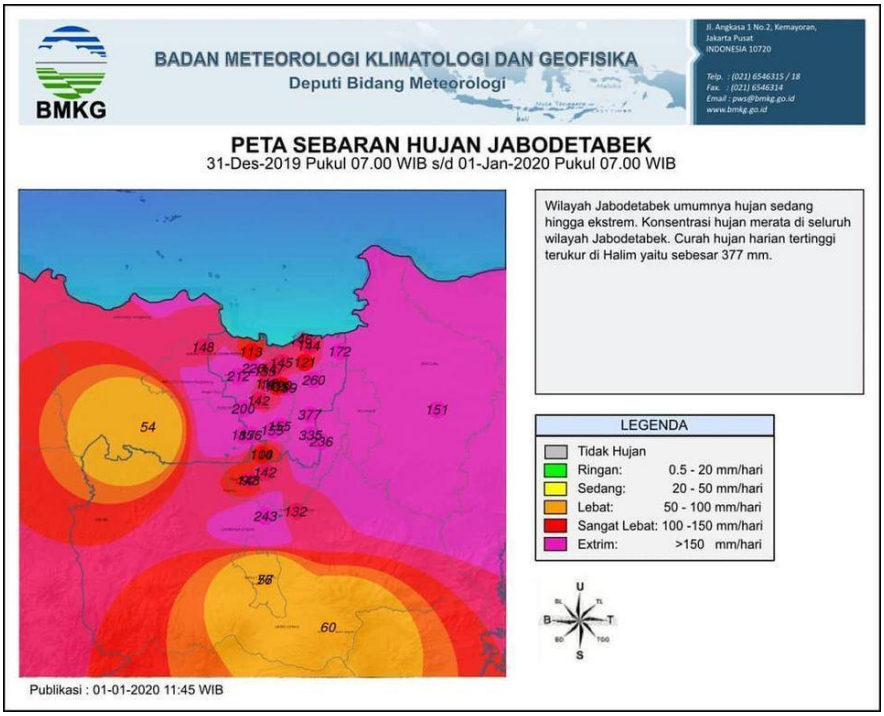


Figure 12 Rain intensities of Jakarta floods in 2020.

Blue area in the map represents Teluk Jakarta and surrounding water areas. Source: BMKG (2020)

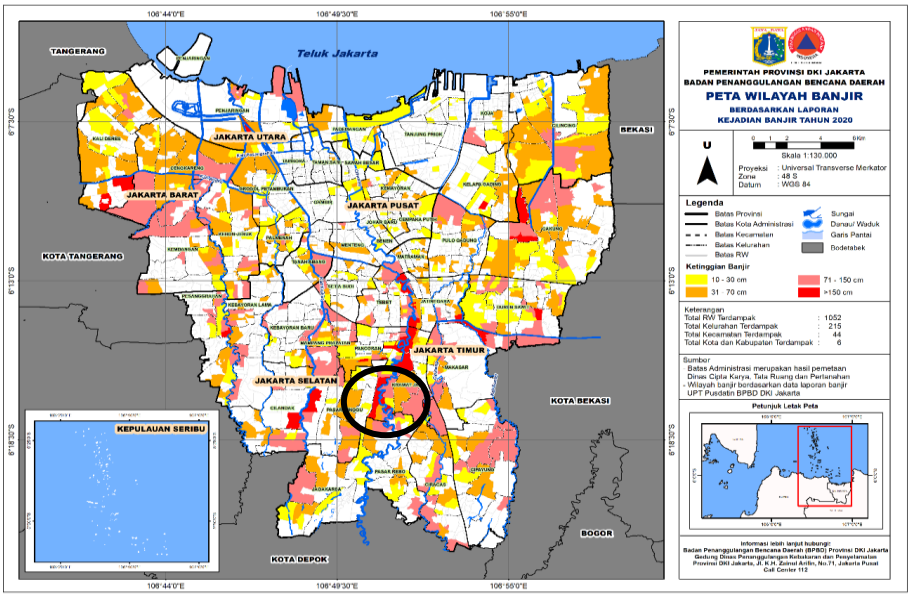


Figure 13 Flood affected areas in 2020

Location of Kampung Melayu (circled in black).
Source: BPBD DKI Jakarta

Based on the flood inundation areas in 2020, 2015, and 2013 (Figure *13*, Figure *11*, Figure *9*) The 2020 Flood was the most extensive and it was caused by the highest rainfall intensity of 377 mm/day inside the DKI Jakarta areas (see Figure *6*), which is claimed as the primary cause of massive floods in Jakarta. The statement was also supported by the fact that at the time the rainfall intensity in Puncak and Bogor City was reported at around 60 mm/day and 58 mm/day, respectively. Table 4 also showed that an overflow from the Ciliwung River was mainly due to the high water level in all the floodgates. Accordingly, these contributing factors caused the 2020 flood to be the most severe. At the time the flood depth was measured and reported to be around 1.5 to 3 meters in Kampung Melayu. Due to the recurring flood experiences, Kampung Melayu Village's officials have been updating their village information for disaster preparedness purposes, such as identifying command posts and temporary shelters, as shown in Figure 14.

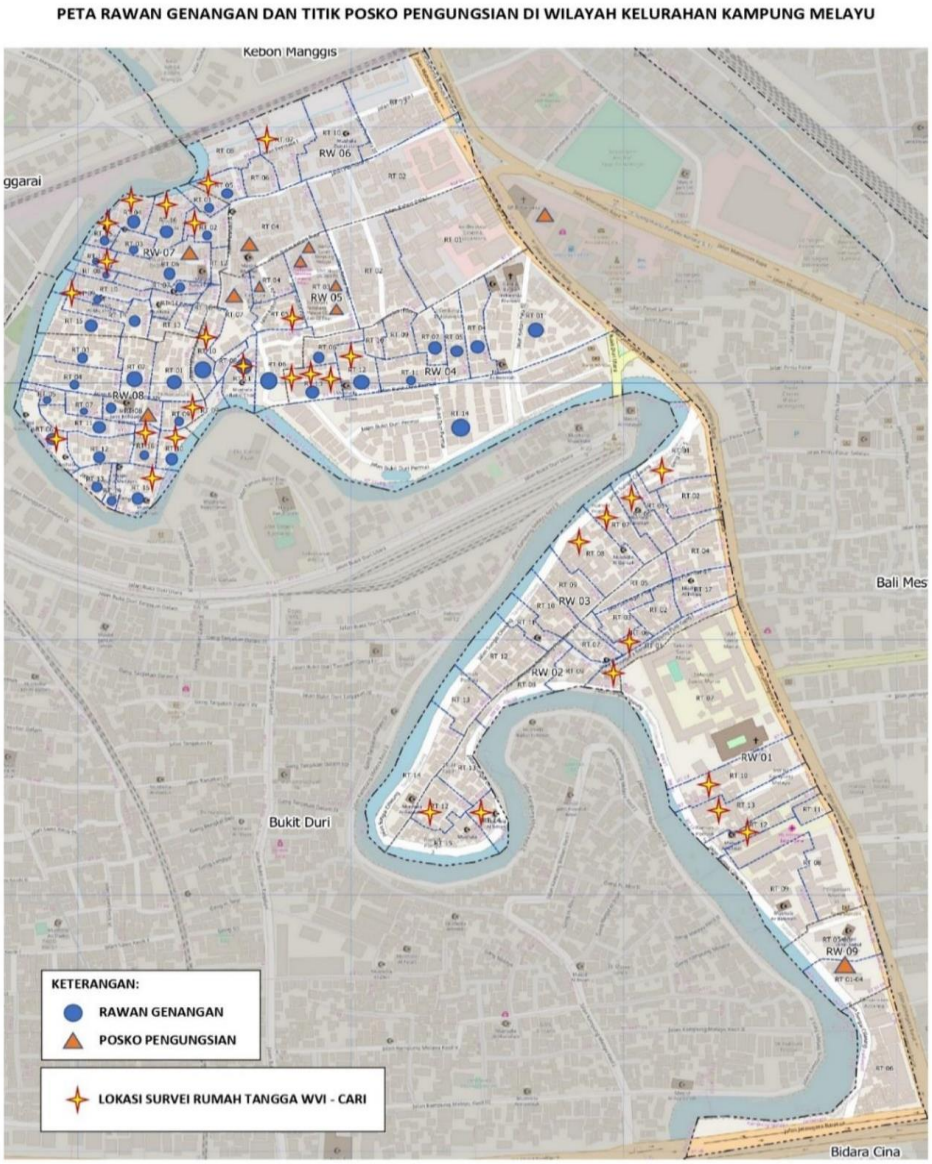


Figure 14 Map of inundation and temporary shelter in Kampung Melayu Village.

Note: survey positions in one RT do not show the actual position of sampling in that RT. This position only marks the selected RT where the household survey was conducted.
Source: Kampung Melayu Village Database.

Characteristic of Kampung Melayu

Kampung Melayu Village is one of 8 Villages in Jatinegara Subdistrict, East Jakarta City, DKI Jakarta Province. According to Jatinegara Sub District in Figures (BPS, 2022), this village has an area of 0.48 square km, which occupies 4.68% of the entire Jatinegara Subdistrict. There are 9 RTs and 106 RWs, with 10,710 households[16].

In the southern part, Kampung Melayu is adjacent to Bidaracina Village and Ciliwung Watershed (Figure *14*). To the North, Kampung Melayu is adjacent to Manggarai Village, on the West to Ciliwung Watershed and Bukit Duri Village, and on the East to Balimester Village and West Jatinegara Street. Kampung Melayu Village is located in the lowlands with a maximum height of 20 meters above sea level.

The distance from the village center to the sub-district center is 6 km, while the distance to the district center is 14,2 km. According to the Ministry of Home Affairs database, the recorded population of productive age (15-64 years) is 23,611 people, the number of children (0-14 years) is 8,380 people, and the number of elderly 65 years and over is 1,575 people[17]. Kampung Melayu is the village with the highest population density in Jatinegara District. The population density of Kampung Melayu Village is 69,604 people/sqkm, with a population of 32,808 people (10,80% of the population of Jatinegara Subdistrict), comprising 16,744 male and 16,064 female residents (104,23% ratio). Most of the population is Muslim (88.74%), Christian (5.83%), Catholic (2.97%), and Buddhist (2.42%). A total of 16,086 residents of the Kampung Melayu sub-district have the marital status "single" and 14,783 "married".

In the past, the Kampung Melayu area was the location of the Malay ethnic population, however, today it is a multi-ethnic community. In general, most of the residents in Kampung Melayu can be categorized as lower-income people. According to the Ministry of Home Affairs database, based on their employment status, as many as 5,215 residents are unemployed, 11,253 entrepreneurs (mostly in informal sectors), and 8,793 students. There are also people working in the education, government, and health sectors. In terms of the educational background, 13,562 residents have high school degrees and 1,550 residents have under-graduate degrees.

[16] See Jatinegara Subdistrict in Figures 2022

[17] See https://gis.dukcapil.kemendagri.go.id/peta/

Based on the results of a disaster risk assessment at the provincial level, East Jakarta has a high risk of flooding and a moderate risk of extreme weather and earthquakes[18]. In addition to the provincial risk map, BPBD DKI Jakarta created detailed historical records of disaster events down to the RT/RW level. It serves as the basis for determining more precise conclusions in areas with potential floods.[19] See Figure *14* for the inundation-prone areas, portrayed by blue circles.

Past disaster impact

The household survey in January shows a 100% understanding to flood risk of all respondents in every RWs of Kampung Melayu (Figure *15*). Arguably, floods occur frequently in Kampung Melayu area and all respondents have been exposed. In the last 5 years, BNPB's database recorded 61 disaster events (10 landslides, 3 strong winds (locally known as *puting beliung*), 1 earthquake, and 47 floods) in East Jakarta. Among them, some were located in Jatinegara sub-district, i.e., two records of landslides and 26 records of flood. In 2022 alone, there were 6 floods, 2 landslides, and 1 strong wind (*angin puting beliung*) in East Jakarta. Among them, 4 floods and 1 landslide located in Jatinegara sub-district.[20] In September 2022, floods submerged RT 5 of RW 5, RT 13 of RW 4, and RW 7 Kampung Melayu areas, with water levels reaching 2 meters.[21] The flood occurred due to heavy rains that caused overflow of water from the Ciliwung River. There were at least 630 families affected by flooding at the time.[22]

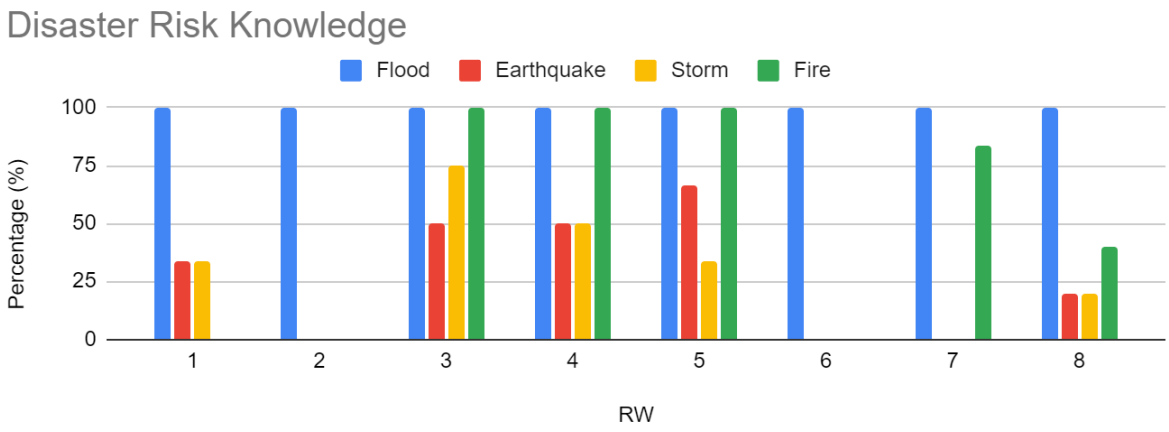


Figure 15 The percentage of disaster risk knowledge of Kampung Melayu's household survey respondents.

[18] See InaRISK (bnpb.go.id)
[19] KII BPBD Jakarta
[20] See Data Informasi Bencana Indonesia (DIBI) (bnpb.go.id)
[21] See Banjir Landa Kampung Melayu Jakarta Timur, Ratusan Warga Terpaksa Mengungsi - Halaman 2 - TribunNews.com
[22] See Banjir di KP Melayu, Ada 1.840 Jiwa Kena Dampak (beritasatu.com)

Before the 2020 embankment construction in RW 1, 2, and 3, all areas of the village used to experience extreme flooding annually (confirmed by all the respondents and KIs). After 2020, many villagers in the said RWs stated that the flood height had lowered, and its frequency reduced. This may indicate a positive effect of the embankment's construction. However, flood risk still exists, especially, in RW 4-8 due to the discontinuation of the embankment construction program to date. Therefore, a substantial number of efforts have been implemented until the present, including the flood forecast through dam monitoring in the Ciliwung River.

There were a variety of flood impacts felt by the community members in Kampung Melayu, ranging from loss of life, injuries, loss of assets, loss of livelihood and so on as shown in Figure *16*. The loss of assets was the most common effect of the flood expressed by the respondents. There were frequent instances where floods caused injuries to family members, mostly those with vulnerable family members, especially children. The loss of livelihood sources is another concern of most residents.

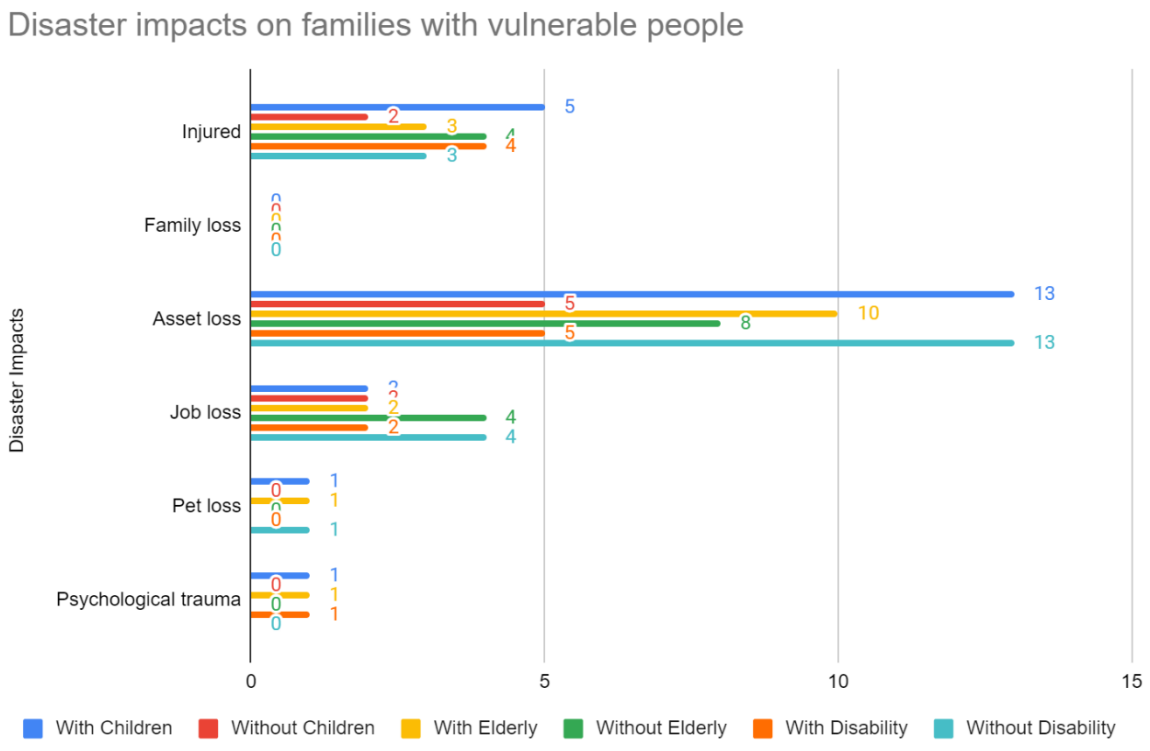


Figure 16 Information on the impact felt by respondents due to flood disasters. Note: numbers may overlap each other.

Flood return period and possible trigger for FbF Activation

Flood in Jakarta is either caused by extreme rainfall in Jakarta or by an overflow of water from the upstream of Ciliwung River, in Bogor. The following is the maximum daily rainfall for the return period scenario of 2, 5, 10, 25, 30, 50, and 100 years, based on the Log Pearson Type III model using 20 Years of rainfall data from BMKG (2000-2019).

Table 7 Maximum daily rainfall for return period scenario

(2, 5, 10, 25, 30, 50,100) based on Log Pearson Type III model using 20 Years Rainfall Data from BMKG (2000-2019) [23]

Return Period (years)	R24 Highest Daily Rainfall (mm)	Rainfall Intensity (mm/hours)
2	119.59	11.362
5	177.378	16.852
10	214.091	20.341
25	258.226	24.534
30	263.936	25.076
50	289.400	27.496
100	319.006	30.309

Based on Table 7 above, the extreme rainfall events that triggered flooding in 2020 have surpassed 100 years of rainfall (daily rainfall > 319 mm). Arguably, this maximum rainfall threshold with a return period of 100 years may be used as a potential trigger for FBEA protocol activation. In terms of the rainfall parameters, 319 or 320 mm/day can be used as the second parameter for the trigger.

[23] See Nauli, Josua K., and Deasilia Indrasari. "Identifikasi Debit Banjir dan Redesign Saluran Drainase sebagai Pengendalian Banjir (Studi Kasus Kebon Baru Jakarta Selatan)." Jurnal Kajian Teknik Sipil, vol. 5, no. 2, 2020, pp. 13-20.

4.2 Availability and quality of hazard forecasting & early warning for Kampung Melayu

Hazard forecasting capability

BMKG, as the mandated agency for hydrometeorological hazard service providers, has officially established platforms for climate and weather forecasts. It enables seasonal, extreme events, and daily forecasts that are relevant for sub-national and local levels, including for Kampung Melayu. The information provided includes data on Greater Jakarta's weather conditions and the water level at several floodgates such as Bendung Katulampa, Depok and Manggarai.

Weather and climate forecast information is provided in several different timeframes which include seasonal, extreme weather and daily forecasts. At the beginning of a seasonal transition, BMKG, BPBD, the Indonesian Navy, and academics held a meeting to discuss monitoring results and season forecasts produced by BMKG as well as tidal information from the Navy. Based on these forecasts, BPBD prepares disaster scenarios for resource preparation.[24]

The nationwide view of the daily weather forecasts and impact-based forecasts can be seen in BMKG Signature[25]. In some situations, such as when there is the potential for extreme weather, BPBD will usually immediately get this information from BMKG either through the WhatsApp App or through the BMKG Signature. However, most forecast information is ordinal or qualitative/non-numeric data that groups variables into descriptive categories with a hierarchical scale. This type is often found in weather forecasts with a short period, in contrast to seasonal forecasts, which are usually completed with numerical information for the potential for rainfall.

As for the water level monitoring, the flood monitoring locations for DKI Jakarta Region, especially Kampung Melayu, are located in three places: Bendung Katulampa in Bogor, Depok Floodgate, and Manggarai Floodgate. In these places, the management constantly updates the hourly water level in each floodgate to the Jakarta Water Resources Office (DSDA). Whenever there is a high level of "siaga" (Figure *18*), the operator will alert BPBD DKI Jakarta and other relevant stakeholders to prepare for early action against floods. Key informants attested that

[24] See ref. transcript of KII BPBD DKI Jakarta

[25] See https://signature.bmkg.go.id/, this web-based system developed by BMKG as pioneering impact-based forecast system.

when the “siaga” status was alerted by Bendung Katulampa operator to BPBD DKI Jakarta, in many instances floods occurred within 8 hours afterward.

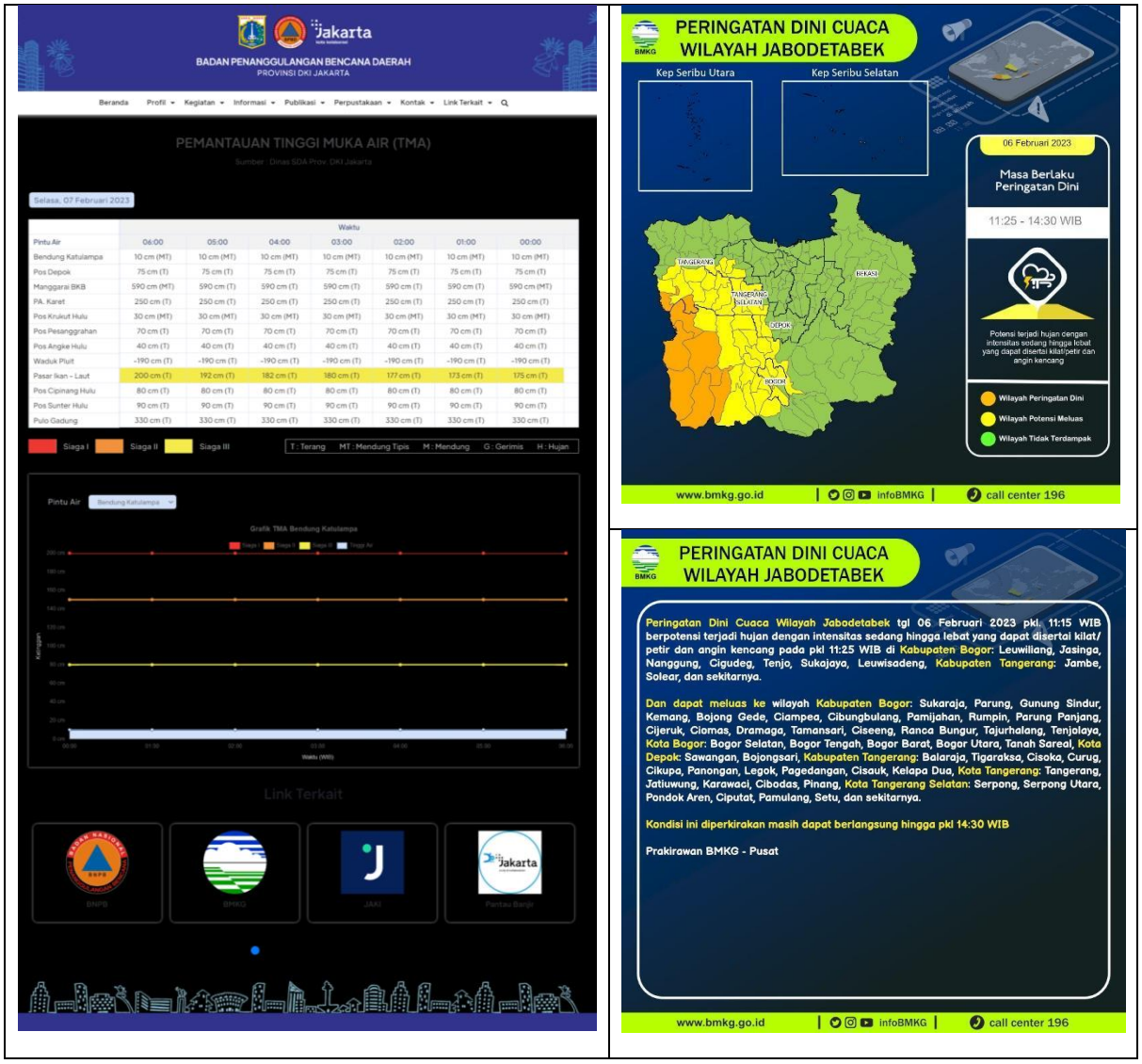


Figure 17 Information product on extreme weather forecasts disseminated by BPBD Jakarta and BMKG

Amidst various ways of updating water level height and disseminating “Siaga” alert status to relevant stakeholders, the Jabodetabek WhatsApp Group was organically developed and its members consisted of a village chief, community leaders, and other community representatives. Through this WhatsApp Group, people can also monitor floodgate conditions individually.

BPBD DKI Jakarta updates the status of the climate and weather forecast of the relevant areas from BMKG through their website. This is also along with water level condition information

from water observation stations, including the one in Katulampa (Figure 17)[26]. Upon receiving the information, it is then forwarded to the community through the village apparatus network. It is then translated in the form of DWS, BPBD-Village Officials' network, and SMS Blast.

Figure 18 Siaga levels and conditions in Bendung Katulampa, Bogor.

The green sign indicates Siaga 4 (water level between 50-80 cm), blue indicates Siaga 3 (water level between 80-150 cm), yellow indicates Siaga 2 (water level between 150-200 cm), and red indicates Siaga 1 (water level above 200 cm).

Early warning in Kampung Melayu

The Kampung Melayu village has early warning and early action equipment, such as safety equipment, signs, and disaster evacuation routes. Based on BPBD DKI Jakarta's data, Kampung Melayu received three DWS devices that can be activated directly from Pusdalops Jakarta[27]. Based on Kampung Melayu's KIIs, there are 3 DWS, i.e., 2 sirens in RW 1 and RW 3, and 1 speaker that broadcasts a recorded disaster warning message in RW 7. All three are used to convey disaster information from BMKG or BPBD and are still functioning properly. In the flood-prone areas that are unreachable by the DWS, village officials use loudspeakers from the mosques in the vicinity to inform villagers about the incoming flood. In RW 08, residents had an initiative to buy disaster warning tools voluntarily for their areas because they were aware of

[26] See ref. transcript of KII Bendung Katulampa

[27] See ref. transcript of KII Kelurahan Kampung Melayu

the urgency.[28] Even though there have been many dissemination channels, Kampung Melayu needs to ensure a feedback loop from the community members and users, whether or not receiving the warning products. This needs to be done to ensure early warning and early action infrastructure could cover 100% of community at-risk or at least the most vulnerable community members.

The initiative of the people in Kampung Melayu is also shown by their individual efforts to educate themselves in relation to flood processes. People of the village have been actively updating themselves with information about climate and weather forecasts and floodgate's water level in several parts of Ciliwung River which they found on TV or other sources listed in Google Search machine[29]. In the midst of a large number of warning information sources accessible to the public, regular community meetings could be used to deliberate and to ensure that the community only have access to trustworthy information sources. Notably, the initiative to check weather/climate forecast information does not associate with their disaster experience as shown in Figure 19.

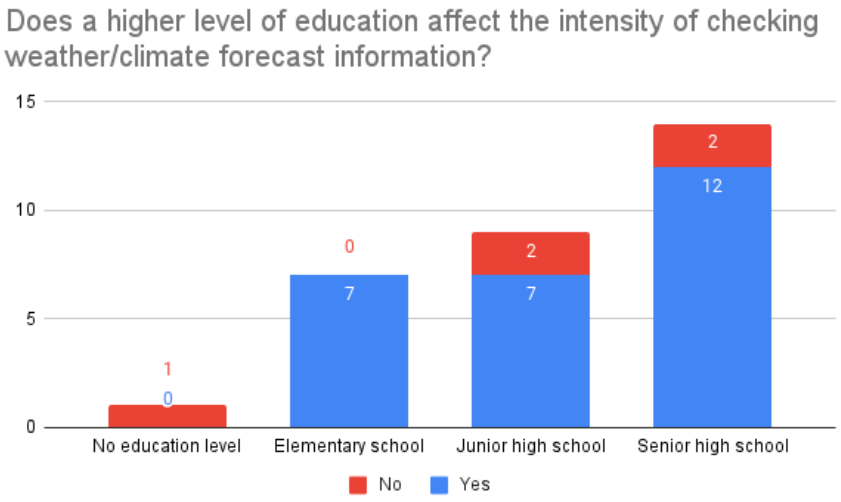


Figure 19 Number of respondents based on education level and the intensity of checking weather/climate forecast information.

[28] See Warga Kampung Melayu Urunan Beli Toa untuk Peringatan Banjir (mediaindonesia.com) and transcript of KII RW 08 Kampung Melayu

[29] See the questionnaire results.

4.3 Risk perception and possibility of early actions according to community and stakeholders: past, present, and outlook

The risk perception among the community and stakeholders in Kampung Melayu is relatively the same. From the perspective of the local government and the community, they have realized that Kampung Melayu is a flood-prone area. BPBD DKI Jakarta understands disaster risk holistically from pre-disaster to post-disaster phases. Based on the KII with Kampung Melayu representatives, the local government (BPBD and Kampung Melayu village) has held simulation and disaster preparedness activities annually. This also includes exercises at schools to increase students' awareness and preparedness.

As part of a *Kampung Siaga Bencana* Program,[30] Kampung Melayu's residents have received multiple preparedness training, especially until before the pandemic.[31] Disaster preparedness training was conducted for each disaster management phase (pre-disaster, during, and post-disaster). The preparedness training was held by BPBD, the Fire Department (Damkar), Kelurahan Office, RW and also WVI. WVI implemented flood simulations twice a year. The community has yet to receive additional disaster drills after the COVID-19 pandemic subsided. Table *8* shows that there is no association between gender type and participation in disaster preparedness activities in Kampung Melayu based on Fisher's Exact Test result (p = 0,660). This condition illustrates that the majority of Kampung Melayu residents basically already participate in disaster preparedness activities regardless of gender.

Table 8 Fisher Test on the relation between gender and participation in disaster preparedness activities

Gender	**Participation in disaster preparedness activities**	
	No	Yes
Male	3	6
Female	5	17
p-value	0,660	

Table *9* shows the crosstab of gender and communication tools to the early action variable after receiving early warning information. This confirms that regardless of gender, the population is able to receive disaster early warning information and potentially take action.

[30] See ref. transcript of KII Kelurahan Kampung Melayu

[31] See ref. transcript of KII RW 06

Table 9 Crosstab on gender and having telecommunication tools with early action after receiving early warning information

Gender	Early action after receiving early warning information	
	No	Yes
Male	0	9
Female	0	22
Having telecommunication tools		
No	0	0
Yes	0	31

There is also no association between education level with awareness to take early action following early warning information as depicted in Figure 20. This is attributed mainly to past disaster experiences among Kampung Melayu residents.

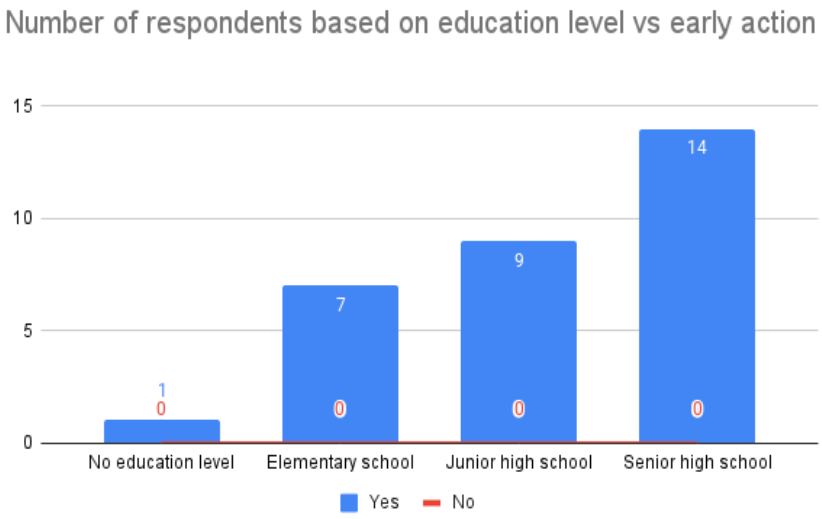


Figure 20 Number of respondents based on education level vs early action

The people who live in Kampung Melayu village already have a high awareness of flood disasters. Figure 21-a shows a high level of participation in preparedness activities (74.2% of the respondents answered yes). The real impact of these training courses is the excellent sense of security felt by the respondent and his family, shown by over 35% of respondents claiming they are safe (Figure 2- b). The embankment constructions in RW 1, 2, and 3 have been quite successful in decreasing flood risk and attributed to a sense of safety of the respondents. In RW 5, respondents claimed to feel safe during the flood because they were used to it. Most of the respondents in RW 7 and 8 are also convinced they are safe from floods because several disaster responses and mitigation training are concentrated around the area, hence the positive

feedback. Unlike other respondents, those living in RW 4 and 6 disagree for multiple reasons. In RW 4, they are skeptical about their safety because of the problematic mobility (regarding disability and alley width of their neighborhood). Meanwhile, in RW 6, they do not feel safe due to the proximity of their houses to the river body.

Even though floods keep on recurring, residents already know the appropriate early action and evacuation location (Figure 21-c). Based on field observation, when a disaster occurs, people evacuate to SDN 02, SMPN 26, Kampung Melayu village office, mosques, or relatives' homes located in areas safe from flooding. In addition, the majority of them also agreed (64.5%) on the importance of having the capacity, assets, and cash to face disaster events (Figure 21-d).

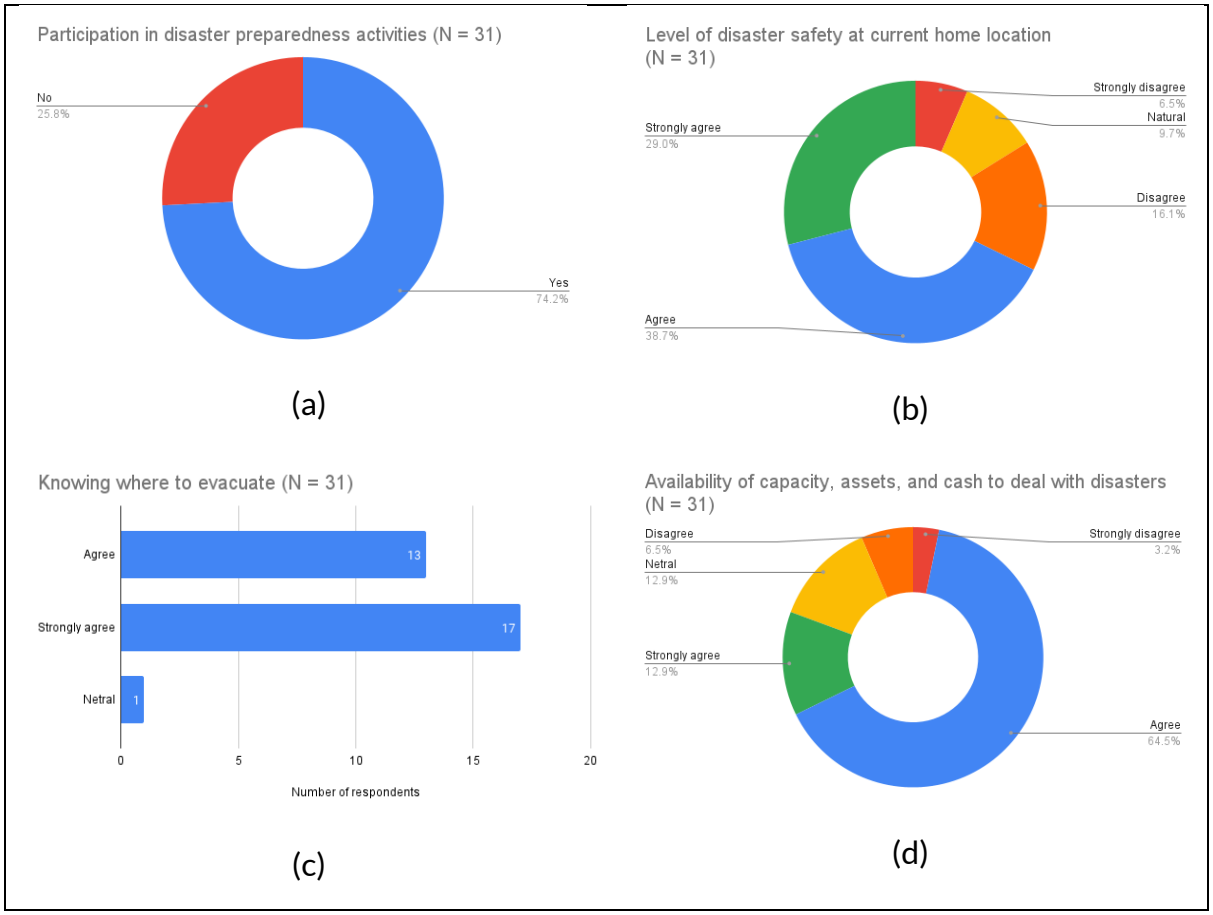


Figure 21 Availability of capacity, assets, and cash to deal with disasters

a) Participation in Disaster Preparedness Activities, b) Level of Safety from Disasters in Home Location, c) Knowing Evacuation Points, d) Availability of capacity, assets, and cash to face disasters

In general, the EWS in Kampung Melayu has been accompanied by supporting infrastructure. Based on field observation, across Kampung Melayu there are supporting equipment, facilities, and infrastructure, such as evacuation route signs, sirens, temporary evacuation locations, as

well as other evacuation support equipment (boats, buoys of emergency lighting, life vest, and rope). When the community was asked about the early warning system, they answered that through sirens and community speakers, they would know that a disaster was imminent. However, there is no evidence suggesting that the number of boats or life vests would be sufficient for saving the lives of the people. Furthermore, no key informants testified that the temporary evacuation shelter has been used for disaster exercises or actual emergencies.

GEDSI (Gender Equality, Disability and Social Inclusion) issues of EWS in Kampung Melayu

The early warning system in Kampung Melayu is accessible and inclusive to everyone. The inclusivity includes efforts to ensure that early warning system information can be accessed and received by vulnerable populations (children and the elderly) and persons with disabilities. The evidence is apparent through the results of the household surveys in Kampung Melayu, as outlined in Table *10* below. Most respondents stated that they agree with the capacity of individual vulnerable groups to access early warning information either independently or proactively conveyed directly by the apparatus. Early warning information is conveyed via various channels that have been provided, using voice-based facilities (TOA, speakers), mobile phones (social media, WhatsApp groups, JAKI applications) to direct information dissemination door to door by RW/RT officials.

Table 10 Crosstab on vulnerable group variables with access to early warning information

Respondents who have children	**Are they able to independently access early warning information?**	
	No	Yes
No	5	3
Yes	7	16
Respondents who have elderly member		
No	6	8
Yes	6	11
Respondents who have member with disabilities		
No	5	15
Yes	7	4

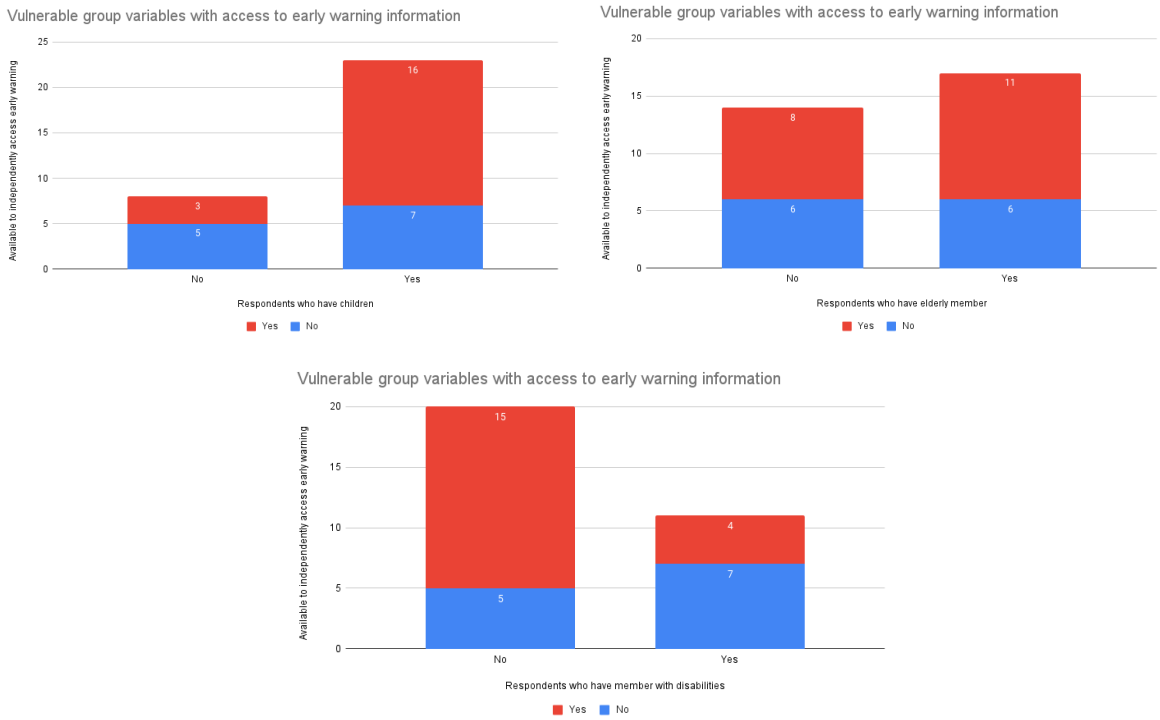


Figure 22 Vulnerable group characteristics and access to early warning information

The knowledge of vulnerable people in Kampung Melayu about disasters is relatively high (Figure *23* a). Most children, the elderly, and some people with disabilities can independently access early warning information. Based on (Figure *23* b), 62.5% of vulnerable communities (children, elderly, and people with disabilities) were claimed to have been able to access early warning information independently. According to the household survey, the communities received early warning information from the TOA, an appeal from the head of RW / RT or surrounding neighbors and saw the information in the WA group. With these conditions, they can take responsive actions to help their families and the surrounding environment cope with flooding (Figure *23* c).

Meanwhile, 37.5% of vulnerable communities claimed they could not access early warnings independently. This is because some respondents have disabilities, e.g., Stroke, Paralysis – tuna daksa, and those with limited cognitive capability – tuna grahita. These people would rely on the closest person at home to access early warnings and take early action. In addition, some respondents also have children who often tend to ignore the risks that exist. To overcome this problem, they need help to strengthen understanding and awareness of how to access early warnings and take appropriate early action. Capacitating and enabling conditions for parental assistance are needed to ensure inclusive consideration followed by appropriate actions.

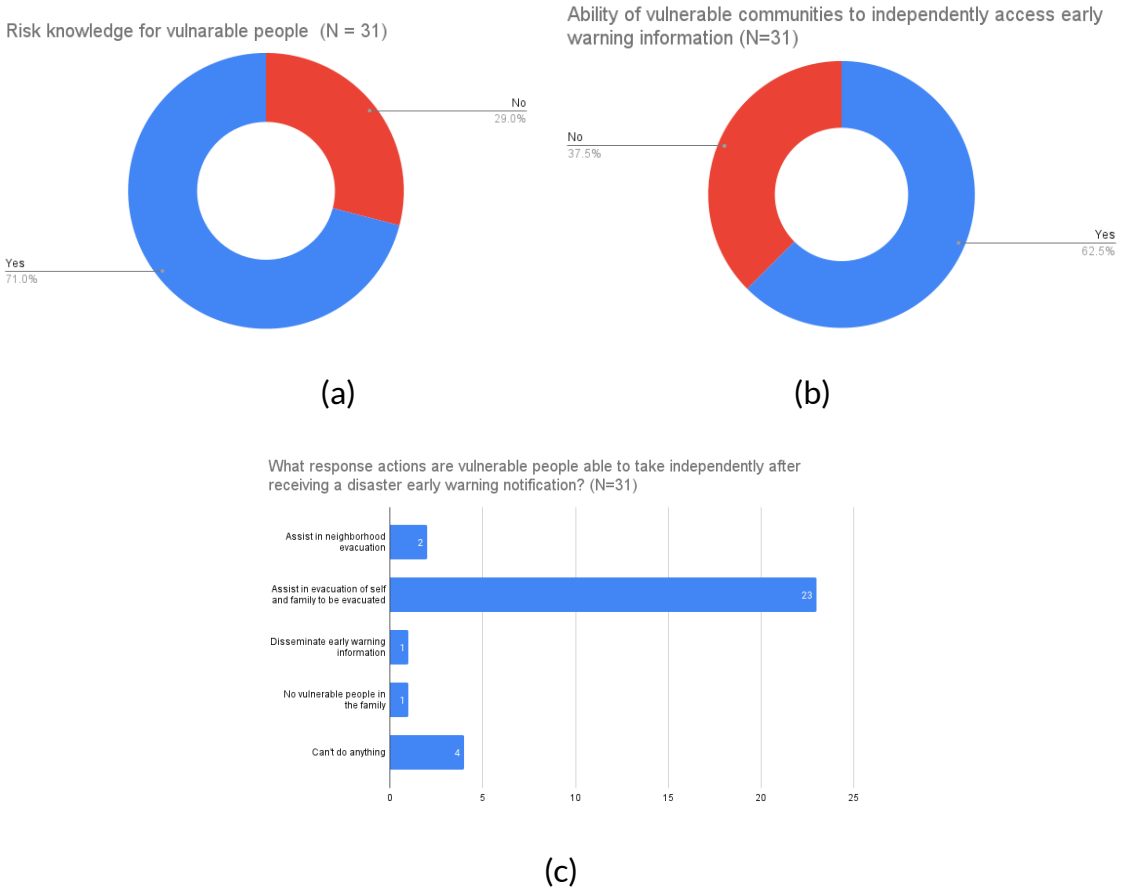


Figure 23 Ability of vulnerable communities in (a) Understanding disaster risks, (b) Independence in accessing early warning information, and (c) Response actions that can be carried out independently.

In terms of children's access to early warnings in Kampung Melayu, children in Kampung Melayu receive early warning information from WhatsApp groups, including groups belonging to their schools, Rtor RW, and Karang Taruna. Some of them have also attended disaster training held at school. In addition, from an early age, they have been taught to swim and how to respond to disasters because their homes are in flood-prone areas. As stated by a respondent in RW 05, their children are still allowed to play and swim when a flood occurs, however, as parents, they will continue to look after and ensure the safety of their children.

There are six schools in Kampung Melayu (three elementary schools, two junior high schools, and one university). The following is a list of schools in Kampung Melayu. There is no strong evidence that these schools have complied with the Disaster-Safe Education Unit guidelines or received any past capacity building.

Table 11 List of schools in Kampung Melayu

School Name	Address
SDN Kampung Melayu 01 Pagi	Jl. Kb. Pala I No.34, RT.3/RW.5, Kp. Melayu, Kecamatan Jatinegara, Kota Jakarta Timur, Daerah Khusus Ibukota Jakarta 13320
SD Ksatria Bangsa	Jl. Matraman Raya No.198-202, Kp. Melayu, Kecamatan Jatinegara, Kota Jakarta Timur, Daerah Khusus Ibukota Jakarta 13320
SD Advent VI Jatinegara	Jl. Jatinegara Bar. No.142 B, RT.8/RW.1, Kp. Melayu, Jakarta Timur 13320, Jakarta Timur, Daerah Khusus Ibukota Jakarta 13320
SMPN 26 Jakarta	Jl. Kb. Pala I No.28, RT.3/RW.5, Kp. Melayu, Kecamatan Jatinegara, Kota Jakarta Timur, Daerah Khusus Ibukota Jakarta 13320
SMP Advent VI Jatinegara	Jl. Jatinegara Bar. No.142 B, RT.8/RW.1, Kp. Melayu, Jakarta Timur 13320, Jakarta Timur, Daerah Khusus Ibukota Jakarta 13320
Universitas Azzahra	Jl. Jatinegara Bar. No.144, RW.1, Kp. Melayu, Jatinegara Barat, Kota Jakarta Timur, Daerah Khusus Ibukota Jakarta 13320

Source: Author's compilation

To ensure the continuity and safety of teaching and learning activities in schools, a disaster-safe schools (SPAB) guideline should be adopted by schools in Kampung Melayu. This is due to the school's location within the proximity of flood-hazardous areas. In case of flood, it disrupts learning activities in schools. In addition, when the flood occurred in Kampung Melayu, many of the people fled to nearby schools – those with multi-story buildings. However, there were suggestions known to the public not to use schools anymore as evacuation places as the survey's response indicated. Hence, during the 2022 flood, many people evacuated to the higher roads around Kampung Melayu with their vehicles.

From the existence of several schools, there is a great need to ensure SPAB adherence in all of them. In case of the community's preference to continue using schools as evacuation places, it should be accompanied by agreements and specific guidelines for the use of schools as evacuation sites. This is necessary to overcome the problems that can arise when the local community uses the school as an evacuation site.

When asked about the potential early actions, many respondents will evacuate in advance when they know a disaster will occur. However, a few respondents are aware that cash withdrawal, advance stocking or buying foods are also a type of early action to face a disaster. Therefore, an introduction to the types of early action related to the cash voucher program is urgently needed to increase public understanding.

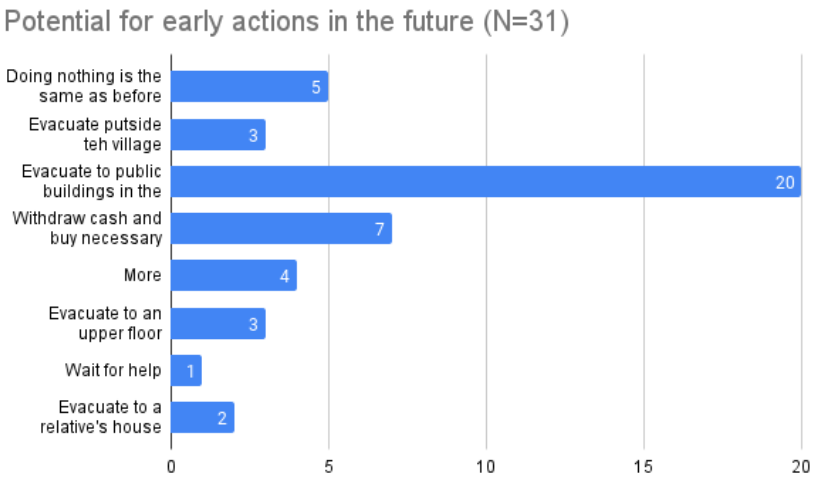


Figure 24 Proportion of potential for early actions in the future according to community

As a form of early action, the cash voucher program can allow the community to buy goods/services needed when a disaster occurs. Figure 25-a shows that most respondents will use the cash voucher program to purchase primary goods such as groceries, food and beverages, and clothes. However, they also know medical and educational needs as secondary options. In addition, some respondents will use it for business/work capital and buying building materials. Finally, a few respondents will use the cash voucher program for savings and other purposes.

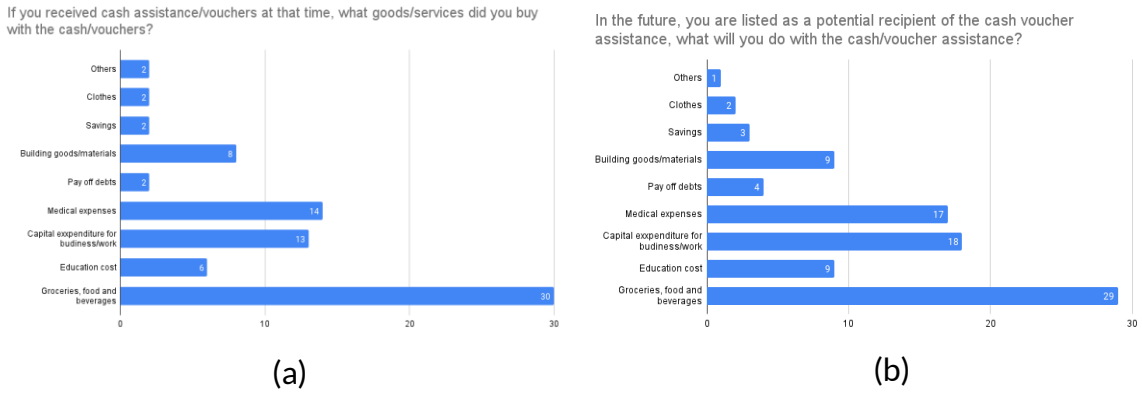


Figure 25 An overview of the types of goods/services to be purchased using the cash voucher program (a past) (b future)

Similar to the respondents' answers about using cash vouchers in the past, Figure 25-b shows that in the future, most will use cash voucher programs to buy primary needs as the first option, such as groceries, food and beverages. The following preference is to utilize the cash assistance for business/work capital and purchase building materials. Finally, some respondents will use it for educational and medical purposes.

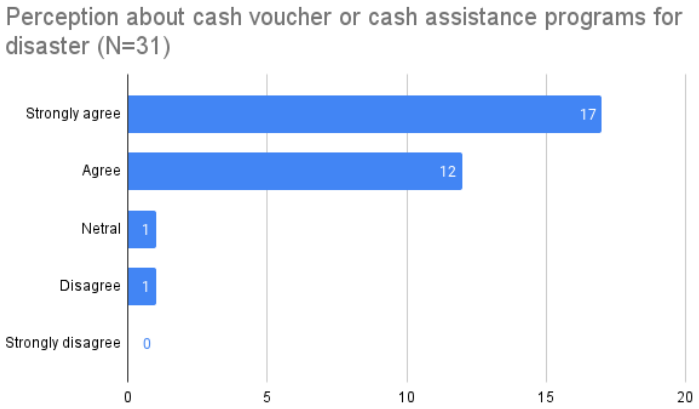


Figure 26 Community perception on cash voucher or cash assistance programs utilization as a form of early action

The residents of Kampung Melayu are aware that cash vouchers or cash assistance will help them deal with disasters, emergency response and disaster recovery (Figure *26*). Only a small number of respondents stated that they strongly disagreed with assistance in the form of cash.

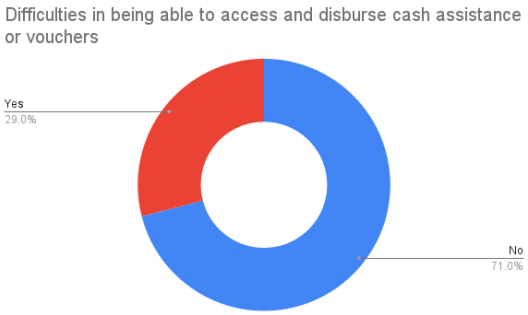


Figure 27 Community perception on cash assistance or cash voucher program difficulties

Although most respondents strongly agreed and agreed with cash assistance for disasters, there are potential difficulties for respondents (29%) to access the cash programs, such as application errors, unrecognized identity, and other technical issues. Regarding access to redeem CVP vouchers at stores/markets, for Kampung Melayu, there have been no market access problems so far because the stores chosen to redeem vouchers are not affected by flooding, so people can redeem vouchers quickly during floods because the stores are not closed. The only obstacle is that some residents complained about the long queues when redeeming shopping vouchers.

Table *12* shows the link between the number of floors and the sense of safety at the current house location. This table also indicates no association between the number of floors with feelings of disaster safety at the current house location in Kampung Melayu based on Fisher's Exact Test result (p = 0,086). However, most respondents who own more than one floor feel

safer from disasters than respondents who live in one story building. This is because people who live in a two-story building will be able to move and protect their assets in a higher place.

Table 12 Fisher Test on number of floors with feelings of disaster safety at the current house location

Number of floors	Feelings of disaster safety at the current house location	
	No	Yes
< 2 floors	1	3
>= 2 floors	20	7
p-value	0.086	

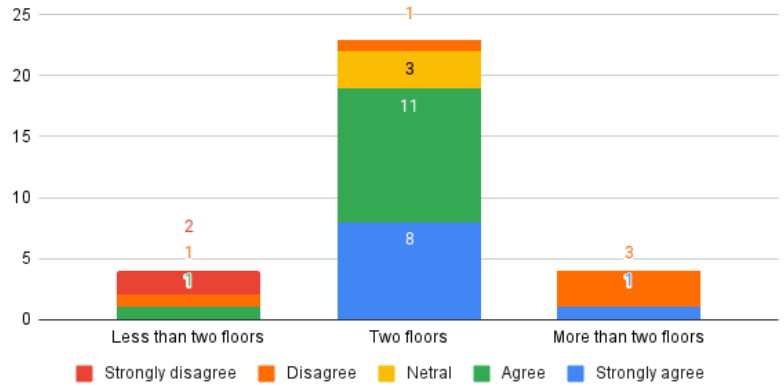


Figure 28 The number of floors in the respondent's house and sense of safety at the current house location

Table *13* shows the linkage between the respondent's living duration in Kampung Melayu and sense of disaster safety at the current house location. Fisher's Exact Test result shows no association between the respondent's stay duration and with sense of safety at the current house location in Kampung Melayu (p = 0,322).

Table 13 Fisher Test on respondents long of lived with feelings of disaster safety at the current house location

Number of years living in Kampung Melayu	Feelings of disaster safety at the current house location	
	No	Yes
< 5 years	0	1
> 5 years	21	9
p-value	0,322	

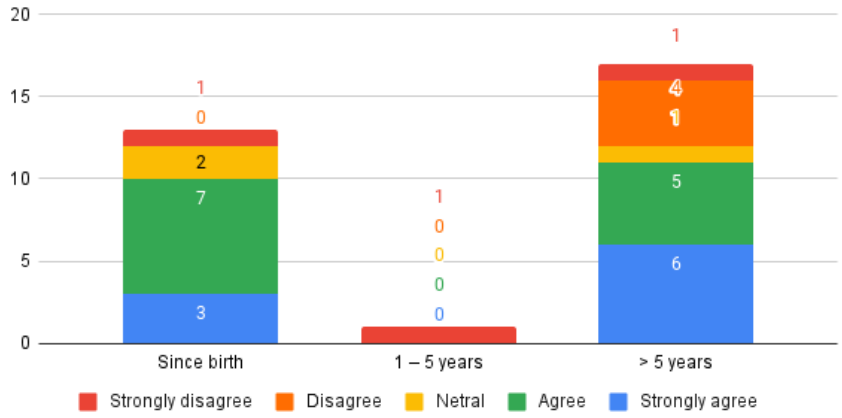


Figure 29 The respondent's habitation record and sense of safety at the current house location

Based on the risk, most respondents indicate expectations towards better management of the Ciliwung River through the completion of normalization, embankment, and canals. In addition, they also highlighted the importance of cleaning efforts of the river body to avoid clogging and continuity of existing drainage maintenance. Respondents were also involved in the past in those efforts and suggested a cash-for-work modality would be appreciated when they were involved in such activities. The respondents also indicated better compensation should be provided when community members were evicted for flood mitigation projects. The community also expects assistance for evacuation from the BPBD, police, or fire department personnel. They also expect the provision of personal emergency equipment, such as, lights, boats, or life jackets. In addition, during the evacuation, it is also expected that emergency transportation, such as ambulance, will be provided.

Regarding the type of assistance expected, most people still expect more options for shelter designation, food and health services. They think the existing evacuation sites are still insufficient, and that advance stock of blankets should be provided. While respondents indicate the need for cash to purchase groceries, in case of emergencies, they hope for ready-to-eat meals. Lastly, the most important thing is the provision of good health services and the availability of adequate doctors and medicines.

Towards the non-governmental organizations, the community expects support for temporary shelter provision and management. Activities such as trauma healing, entertainment, and child-friendly activities are very much looked forward to by the affected community. Naturally, provision of food assistance and non-food relief items are also appreciated, especially those distributed to small alleys. The affected communities also hope NGOs could be more responsive in supporting evacuation processes.

4.4 Institutional capacities and processes

Various stakeholders introduced various flood risk management programs in Kampung Melayu, including constructing, maintaining, and normalizing rivers, riverbanks, canals, ditches, and drainage.[32] They also established a community flood preparedness cadre who also increased environmental awareness of the people. Furthermore, non-government organizations, e.g., Baznas DKI Jakarta, renovate the riverbank around the community housing in 2021[33]. This program includes renovating areas with stilt houses, repairing drainage, and constructing infiltration wells. This program is considered effective in reducing the negative impact of flooding[34].

Based on the questionnaire, most respondents in Kampung Melayu trust the village head and local government, as shown in Figure 30. They believe that the local government already has a plan for disaster management. The availability of the Contingency Plan document and SOP for flood disaster management in Kampung Melayu also supports this sentiment. The process of preparing the contingency plan document review was carried out in collaboration with various stakeholders, including the ranks of the Kampung Melayu village apparatus, representatives from RT and RW, KSB members, FKDM, Karang Taruna, and community leaders.

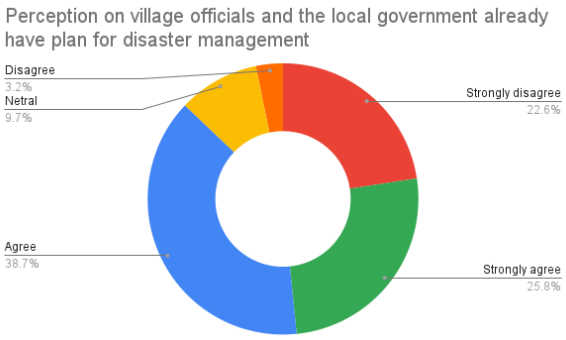


Figure 30 Community perception to village official & local government for disaster management

Based on the interview with a representative from BPBD DKI Jakarta, they had proposed to Bappeda for a budget allocation for disaster management for villages with high flood risk – including for cash vouchers allocation during disaster. However, the realization and implementation were different. According to them, there is no specific regulation that could

32 See Jatinegara Subdistrict in Figures 2022

33 See Penerima Manfaat Bedah Kawasan di Kampung Melayu Kini Tak Perlu Mengungsi saat Banjir (sindonews.com)https://metro.sindonews.com/read/595973/170/penerima-manfaat-bedah-kawasan-di-kampung-melayu-kini-tak-perlu-mengungsi-saat-banjir-1636600269

34 See Berkat Program Bedah Kawasan, Warga Kampung Melayu Tak Lagi Ungsi Saat Banjir (mediaindonesia.com)

regulate the cash or voucher disbursement during disasters from state funding. The Kampung Melayu village contingency plan document also shows no indication of an FBEA program. Nevertheless, BPBD DKI Jakarta does express a positive impression of the CVP program carried out by other actors for the community affected. They agree that to advance an FBEA agenda, a special regulation is necessary to ensure the intended targets and beneficiaries of the program.

The community is also aware of the existence of NGOs that may assist them in carrying out disaster management activities (Figure *31*). The fact that many NGOs assisted the community during flood emergency response contributed to this awareness. However, aside from WVI, there was no other NGO providing disaster management activities in other phases. Furthermore, when the respondents were asked about their expectations from NGOs, some respondents said they require disaster training and simulation besides essential assistance (food, fresh water, etc.).

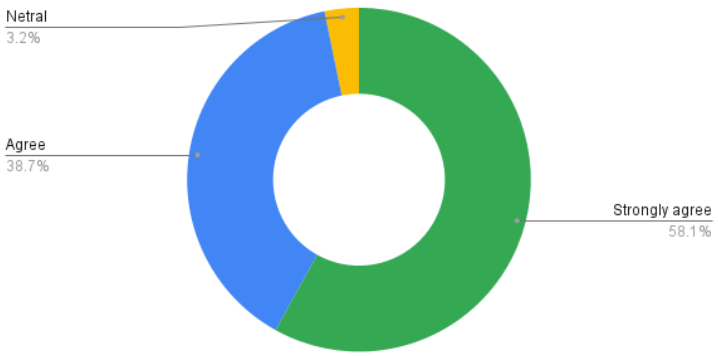


Figure 31 Community perception on NGOs involvement in disaster management

As confirmed in KIIs, WVI is the only non-governmental organization that provides cash assistance in Kampung Melayu. However, the provision of cash assistance during the disaster was considered ineffective because the community was only able to use the service several days after the disaster. In the CVP distribution process, WVI is assisted by Duit Hape as the service provider for aid distribution. The WVI, as the budget holder sent the list of beneficiaries' data to Duit Hape, which subsequently be inputted into the system. According to the Duit Hape representative, there are two ways of distributing aid: cash and in-kind. However, there were instances where fraud was detected. Hence, the assistance was then provided as a cash voucher.

The WVI process to launch the CVP program constitutes four stages, as listed below.

1. Prepare. In this stage, WVI consults with local communities to assess their needs, conducts market analysis, and analyzes existing disaster risks.

2. Design. At this stage, WVI assesses response options based on the program area's risk analysis results and community conditions. Then WVI determines the modality or form of assistance, whether cash or vouchers. At this stage, WVI also determines the nominal service provided, then consults with the community and conducts internal WVI discussions to manage staff and program organizational structure. At this stage, WVI determines the FSP based on the selected modalities. For the CVP 2020 program related to flood assistance, WVI collaborates with DUIT HAPE as the FSP. Meanwhile, for the CVP 2021 program associated with COVID-19 service, WVI collaborates with the Post Office as the FSP.

3. Implementation. At this stage, WVI conducts FGDs with stakeholders in the village to target program beneficiaries, register program beneficiaries, transfer assistance, verify beneficiaries, and make reports on the implementation of the assistance program.

4. Monitoring, Evaluation, Accountability, and Learning (MEAL). In this stage, WVI conducts monitoring, ensures accountability, conducts evaluations, and learns the good things from the programs that have been carried out.

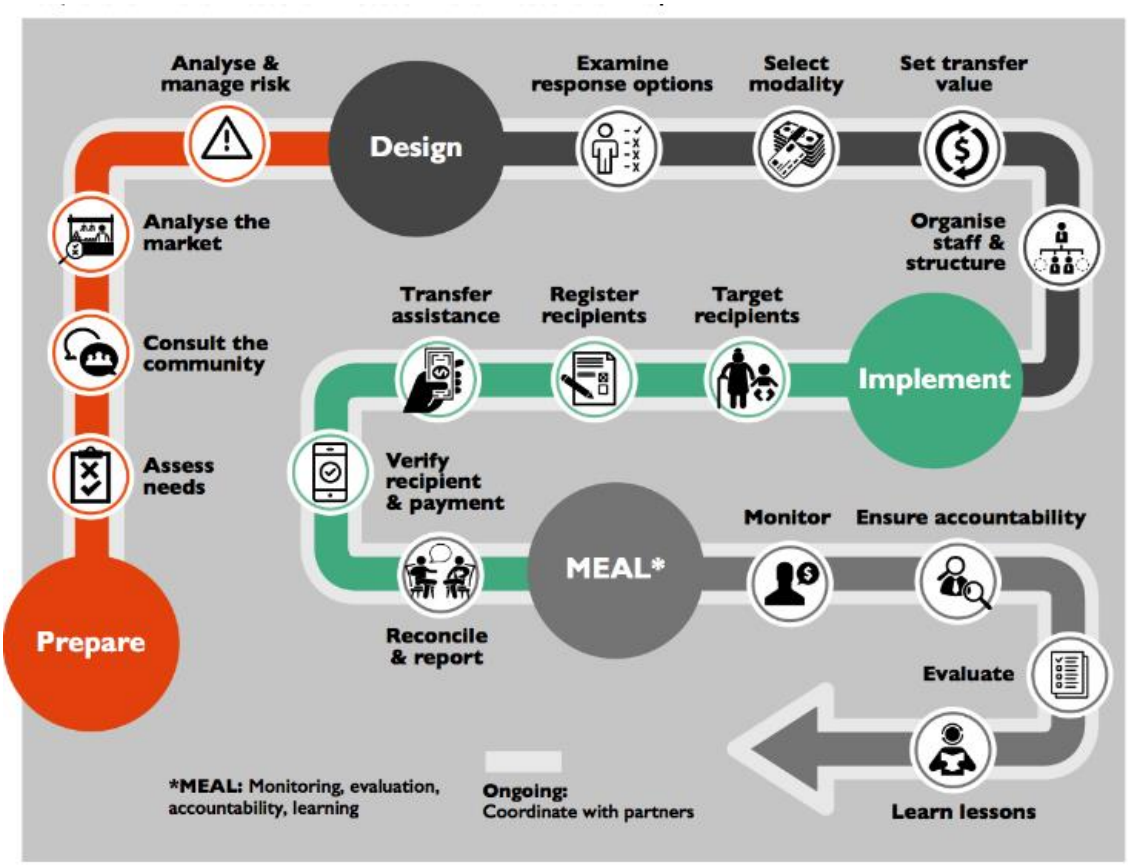


Figure 32 The WVI's CVP Process

There are two approaches that the WVI Duit Hape took for managing the cash voucher program. One is from the store side, and another one is from the voucher beneficiaries side. For the former, Duit Hape established a partnership with local stores and provided training to ensure transactions could be done through the Duit Hape's system. For the latter, Duit Hape followed the WVI who consulted the Kampung Melayu village apparatus in creating the potential beneficiary's database. The step is essential and provides the basis for subsequent disbursement in case of disaster.

In case of the imminent occurrence of a disaster, Duit Hape then consulted the WVI, village apparatus, and Dasawisma regarding the timing for cash voucher utilization. Upon clearance, Duit Hape creates an account for each beneficiary. The account creation is conducted manually where they need to record the facial data of the beneficiaries and a validation pin.

The CVP modality in disaster emergency response was carried out twice in 2021. The amount disbursed was 1.5 million IDR and 900 thousand IDR respectively. For each transaction, Duit Hape recorded each data point of CVP utilization by beneficiaries. This includes the time,

location, products purchased, and amount of purchase. All transaction data was subsequently provided to the WVI.

Duit Hape's technology-based processes have three advantages:

2. Products targeting. With digital vouchers, they can limit the type of products that can be purchased. This is contingent on the program target. For Kampung Melayu, the program was a flood relief program. Hence, some items included in the whitelist are kitchen utensils, school equipment, and mattresses.[35]

3. Support for local micro-businesses. Duit Hape could create a whitelist of eligible stores and their commodities whereby voucher redemption can be processed.

4. Accountability and transparency. A specific time frame for redeeming cash vouchers, provides accountability in accordance to the program's needs. Furthermore, the data management was also transparent for audit purposes.

The WVI has had a strong relationship with the local government and community in Kampung Melayu in the past three years. This includes two batches of CVP programs utilization in Kampung Melayu. The first one was during the 2020 flood through a shopping voucher provision. The second one was in 2021, in the form of cash assistance to help the community during the height of the COVID-19 pandemic. In implementing the CVP program, WVI has collaborated with related agencies such as BPBD or the Office of Women's Empowerment and Child Protection, even though it was only for coordination regarding the detailed implementation of the activities. The KIs indicate the need for an MOU among organizations regarding disaster programs. These resources and strong relationships with key stakeholders and the community can help WVI Kampung Melayu implement future FBEA projects.

4.5 Financing capabilities of communities, WVI, and relevant stakeholders

Flood disaster management is one of the priorities of the Jakarta provincial government. This is shown by the budget commitment with a large increase in terms of allocation from 17.2 billion IDR in 2018 to 21.5 billion IDR in 2022 for disaster information management. This includes the

[35] Whitelist of products are those eligible for voucher redeem, and naturally goods/items included in the blacklist cannot be redeemed by the voucher.

development, utilization and maintenance of DIMS, EWS, social media accounts, and the Call Center 112[36].

The DKI Jakarta government also shows commitment to community-based DRR at the village/kelurahan level. As per the government design, *Lurah* or Head of village/kelurahan is also appointed as disaster manager in his/her area and responsible for overall disaster management strategy, emergency management, and capacity building.[37] This commitment was legally promulgated through Governor Decree 1245 regarding the appointment of *Lurah* as disaster managers at local (village / *kelurahan*) level.[38]

Based on this Governor's Decree, *Lurah* was also given the authority to manage the budget for disaster management. This decree can support the implementation of early flood disaster action. BPBD has advocated for Bappeda Jakarta to allow for budget allocation in proportion to flood risk level, which includes indicators based on past inundation height, coverage of inundated areas, number of evacuees, and possible duration. However, this effort is still unsuccessful, and future budget utilization guidelines are necessary.

Also, since 2015, the Provincial Government of Jakarta has issued policies regarding social assistance for disaster victims[39]. It provides a detailed explanation, including the scope of social service, which includes restoring physical and social psychological conditions, increasing economic capacity, and enlarging information access to sources for social welfare. In addition, it also explained the principles of providing social assistance to disaster victims, which include: 1) priority to vulnerable groups, 2) non-discrimination, 3) fast and precise, 4) coordination and integration, 5) transparency and accountability, 6) partnership, 7) empowerment and 8) non-proletarian (i.e. prohibition to influence someone's faith while providing aid, such as during disaster). Therefore, it is best to align with the scope of regulated social assistance from planning to implementing the flood early actions in Jakarta following the eight principles mentioned above.

The delivery of assistance as per the regulation above includes the provision of direct assistance and for strengthening of institutional capacity. The social assistance coverage includes the immediate provision of clothing, food, and shelter assistance; health services; provision of

36 Amandement version of Strategic Plan of BPBD DKI Jakarta 2018-2022

37 See ref. transcript of KII of BPBD DKI Jakarta

38 DKI Jakarta. 2020. Keputusan Gubernur No. 1245 Tahun 2020 tentang Penetapan Lurah Sebagai Pengelola Penanggulangan Bencana di Wilayah Kelurahan. Gubernur DKI Jakarta: Jakarta

39 Peraturan Gubernur Provinsi Daerah Khusus Ibukota Jakarta Nomor 142 Tahun 2015 tentang Bantuan Sosial Bagi Korban Bencana

temporary shelters; psychosocial therapy services in shelters; house building materials and cash via bank transfer; provision of public kitchens, clean water, and healthy sanitation; funeral provision; essential economic recovery assistance; and fulfillment of post-disaster basic needs. Food provision occasionally utilizes the modality of emergency public kitchens in the field, including the provision of ready-to-eat foods valued at 20,000 IDR per person per day.

Governor Decree 35/2021 regulates the Procedure for Providing Grants and Social Assistance[40]. There is a mechanism to distribute any kind of relief support for individuals, families, or families whose life conditions were affected by unfortunate situations or having certain social handicaps. These include cash disbursement or cash vouchers as shown in Figure 33-b, which includes BLT, *Bantuan Disabilitas*, *Bantuan Lansia*, and PKH (Figure *33* b). However, those are not limited to disaster, but rather regular cash assistance (e.g., monthly). Cash or disbursement during a disaster emergency is still only provided by the WVI.

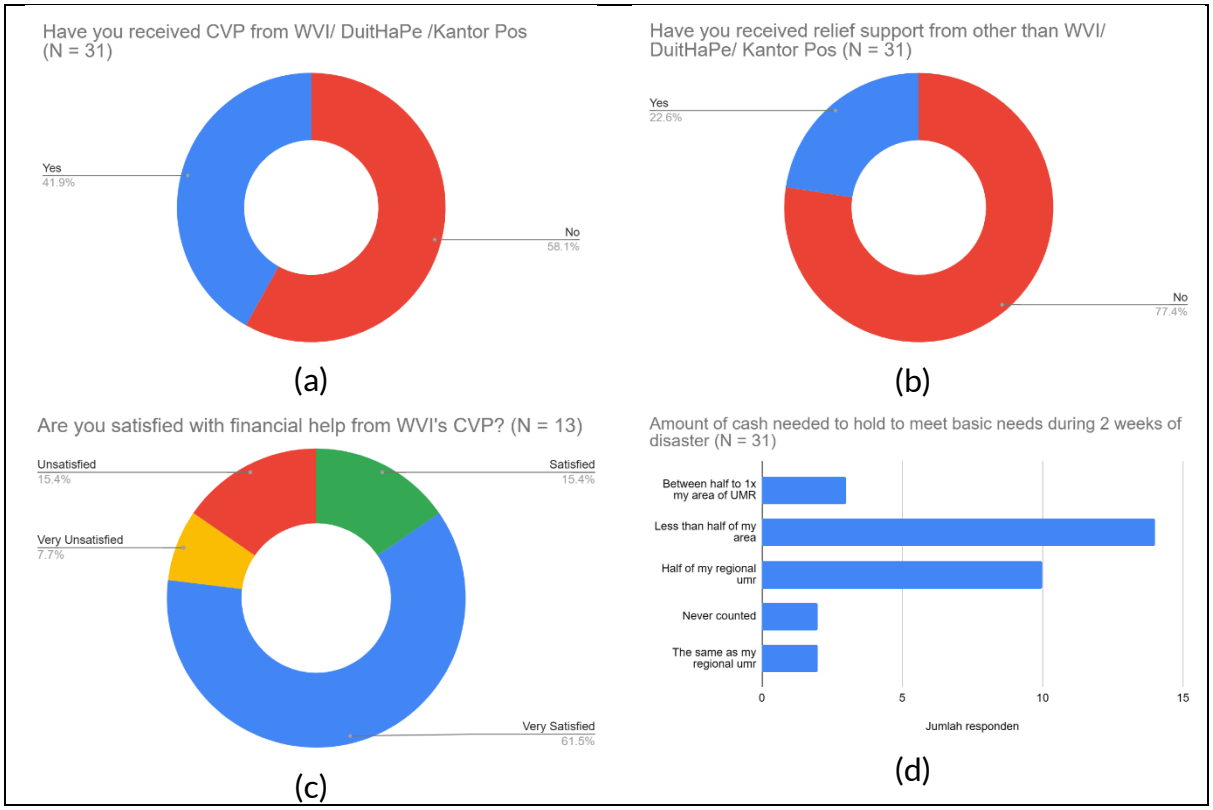


Figure 33 CVP benefit recipients in Kampung Melayu and perception on cash provision during flood disaster

[40] Peraturan Gubernur (PERGUB) Provinsi Daerah Khusus Ibukota Jakarta Nomor 35 Tahun 2021 Tentang Tata Cara Pemberian Dana Hibah dan Bantuan Sosial

The survey in Kampung Melayu shows no CVP designed for distribution prior to the disaster event as a form of early action. Instead, some of the respondents indicated CVP reception after the disaster occurrence, sometimes with a time delay from 2 weeks to 1 month after the disaster.[41] During this time, data shows that more than 50% of the respondents did not receive cash assistance from WVI through DuitHaPe or the Post Office (Figure 33-a), and more than 65% of respondents did not receive any cash assistance other than from WVI (Figure 33-b).

Respondents not receiving any cash assistance have no information regarding the eligibility criteria. Also, some who had registered as beneficiaries ended up receiving nothing and said that no further explanation was provided. For those who received cash assistance, all respondents were satisfied and felt grateful to have received assistance. However, they expressed that the assistance was not able to meet all household needs during emergency situations. In the event of a disaster, most respondents stated given that disaster response usually takes up to 2 weeks, naturally, the amount of CVP should be at least half of DKI Jakarta's minimum wage (Figure 33-d). However, even with a limited amount of CVPs, all respondents indicate a positive perception and acknowledge the benefits of cash assistance.

All KIIs indicate the benefit of CVP of WVI for meeting daily needs after a disaster, especially for vulnerable people. Their perception was that the WVI mainly targeted children and those paralyzed and have difficulties moving independently. From two implementations of the CVP in Kampung Melayu, key informants mentioned that the CVP amount was between IDR 900 thousand to 1.5 million and targeted families with vulnerable members. The actual disbursement amount, according to them, depends on the number of vulnerable people present in the family. According to most of the respondents in this category, the CVP amount received in the past was lower than the expected amount. Nonetheless, in Kampung Melayu, there are a lot of vulnerable people, and not all have been recorded in the beneficiaries list of the WVI's CVP (Figures 33-a and b). Even though the voucher was not enough to cover their expenses, those who did not receive the CVP in the past are still hoping to be included in the future because they need the voucher to cope with the flood impacts.

Most of the respondents in Kampung Melayu work as traders (8 people), service providers (3 people), work full-time as village apparatus, and the remaining have irregular jobs, unemployed or volunteering as a cadre (Dasawisma or Jatinegara sub-district health cadres). The respondents are basically classified as having lower income levels. Based on the survey we

[41] See ref. transcript of KII of various Head of RWs

conducted, 51.6% of our 31 respondents had an income less than IDR 1,500,000 per month or only 30.6% of the Jakarta Regional Minimum Wage of IDR 4,901,798. Their economic vulnerability is even weaker since many of them do not have savings (74.2%). Thus, there is no emergency fund that can be used if an emergency occurs due to flood or other disasters. The distribution of our respondents in Kampung Melayu can be found in Figure 34 below.

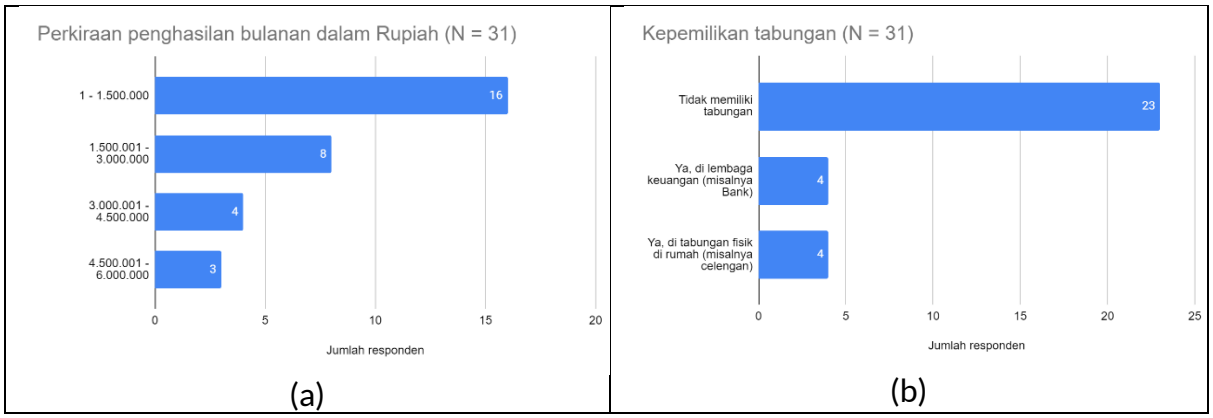


Figure 34 Respondents' range of income (a) and savings possession (b)

Based on the results of the Fisher Test on the income payment variable against saving association, no strong association was found. Based on the Fisher's Exact Test shown in Table *14*, the result is p=0.298 (p> 0.05). One of the reasons identified, naturally, was that such low income is already limited for meeting monthly needs let alone for saving.

Table 14 Fisher test on the income payment with saving possession

Income Payment	**Savings possession**	
	No	Yes
No	6	0
Yes	17	8
p-value	0,298	

Having no savings, those respondents that at the time of floods, they would have difficulties accessing basic needs, including food and drink. Furthermore, families with vulnerable members (e.g. toddlers, PWDs, and elderly) also expressed grave concern about their abilities to fulfill specific needs for them, such as diapers, milk, or specific medicines.

Although many respondents do not have savings, they are aware of the importance of having sufficient capacity, assets, and cash to overcome the impact of a disaster. This can be seen from Figure 35, which shows that from each income group in Kampung Melayu, the majority agreed or strongly agreed. Respondents who expressed strong disagreement, albeit slightly more

superior monthly income, reflect on the fact that their houses are only having one floor. Hence, they felt that regardless of having capacity, assets, and cash, they would have been exposed to the hazard in the first place. For them, the most important is to have a better capacity to evacuate provided by the government or other actors, and not necessarily having their own assets and cash will eliminate the risk factor.

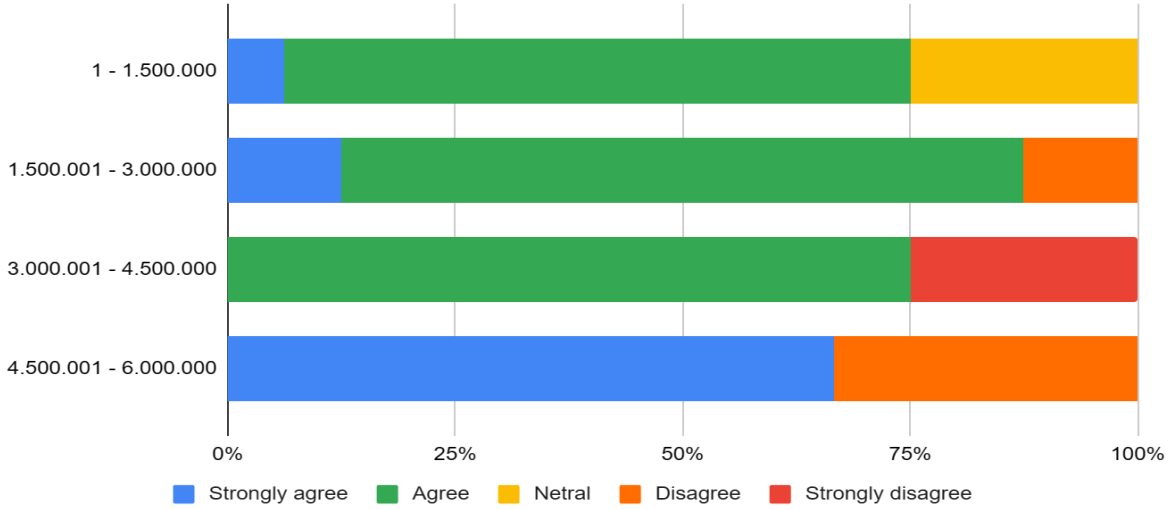


Figure 35 Perception on the importance of availability of capacity, assets, and cash needed to cope with the disaster based on income group

The Fisher test presented below also indicates no significant association between the level of income and with sense of security at the current house location.

Table 15 Fisher test on the income payment with feeling safe from disasters in the current house location

Income Payment	**Feeling safe from disasters in the current home location**	
	Yes	No
More than Jakarta UMR	3	0
Less than Jakarta UMR	18	10
p-value	0,298	

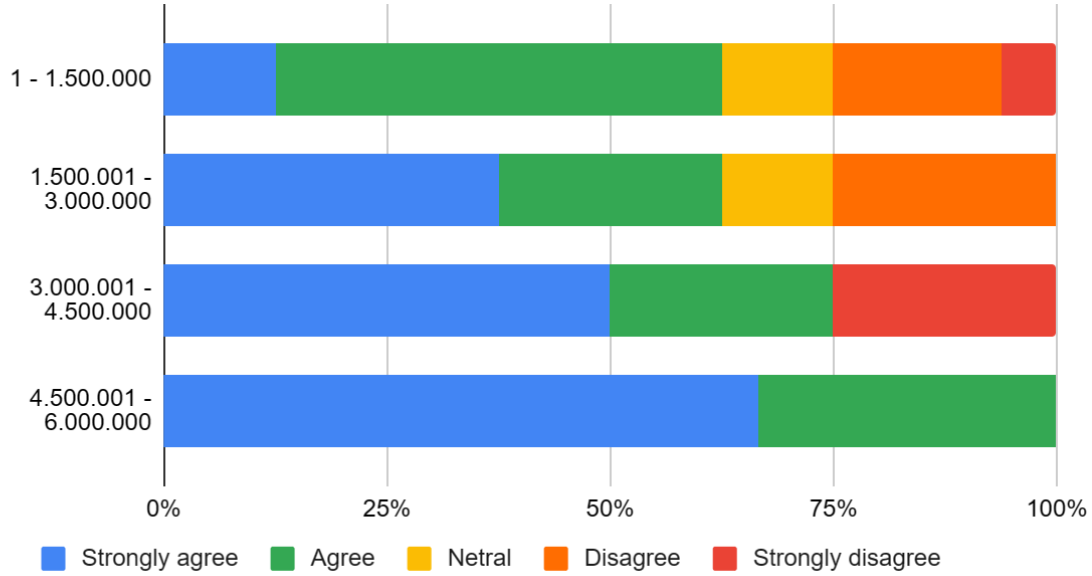


Figure 36 Perception on availability of capacity, assets, and cash needed to cope with disaster based on income group

Table 16 presents the result of the Fisher Test on the status of saving possessions with the availability of capacity, assets, and cash to cope with disaster. The test result shows the association between saving possession and availability of capacity, assets and cash to cope with disaster in Kampung Melayu based on Fisher's Exact Test result (p = 0,641). This condition illustrates that the majority of Kampung Melayu residents basically already have the capacity, assets and/or cash to handle disaster events, regardless of whether they have savings or not. However, those without savings basically indicate intangible capacity that supports their sense of security, e.g. risk awareness and preparedness.

Table 16 Fisher Test on the Income Payment with Saving holdings

Savings possesion	**Availability of capacity, assets and cash to cope with disasters**	
	Yes	**No**
Yes	7	1
No	17	6
p-value	0,641	

Most of the people in Kampung Melayu have adapted to frequent flooding. Although most of the respondents are classified as within the lower income group and many do not have savings, from a disaster-capacity perspective, they already know the actions needed upon receiving a flood

warning and reduce the damage or impact to their assets. They testified that once a warning was received, most would save their assets for the 2nd floor of their houses. In addition, several respondents also mentioned that they would receive flood and other relief items even though had been evacuating to the 2nd floor of their house. They would also evacuate the vulnerable first, before other family members. In this sense, these types of actions are not quantifiable by monetary dimension alone.

In general, the respondents in Kampung Melayu expect that the nominal amount of assistance for meeting basic living needs for two weeks is equivalent to half of the Minimum Wage in Jakarta or around IDR 2,450,000.[42]

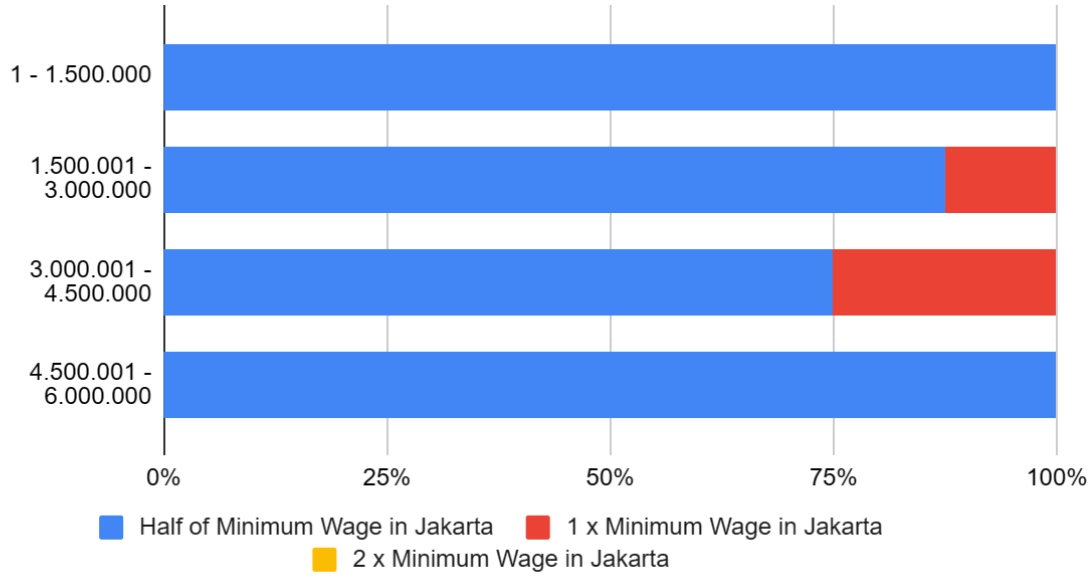


Figure 37 Number of respondents based on income range and expected amount of cash assistance

Based on the respondents' answers, most cash assistance will be used for purchasing food and water. In addition, the purchase of special needs, e.g., specific medicines for vulnerable family members that cannot be covered by BPJS, milk and diapers for babies, and other special needs for the elderly. This was confirmed by KIs representing Duit Hape from their record in facilitating the WVI's program. Some beneficiaries would also buy equipment that can kick-start income-generating activities, such as a purchase of a blender for starting a food and beverage

42 Jakarta's UMR in 2023 is reported at IDR 4,901,798.

stall. The blenders they bought were mainly used to sell drinks or to help grind spices for the dishes they sold.[43]

4.6 Availability, access, and quality of social protection

Several social protection programs have been received by respondents in Kampung Melayu Village, such as Direct Cash Assistance (BLT) provided during the COVID-19 pandemic. In addition, a proportion of Kampung Melayu residents are also beneficiaries of the *Keluarga Harapan* Program (PKH) through a Conditional Cash Transfer (CCT) modality. The PKH beneficiaries can be classified into three groups according to the program coverage that they received. First, the Health Component beneficiaries who are mainly include pregnant, postpartum, or breastfeeding women and those with infants. Second, those who received coverage for the educational component, which targets school-age children. Third, the social welfare component targets the elderly and people with severe disabilities.[44] Apart from PKH and BLT, there is also a cash assistance program for the elderly provided by Kampung Melayu Village office. Just like other programs, this assistance program is not specifically provided for disaster situations. This is unlike the assistance budgeted in the Kampung Melayu, which is mainly used for food assistance provision.

One of the data that is usually used as a reference in determining beneficiaries of social assistance is *Data Terpadu Kesejahteraan Sosial* (DTIKS) or Social Welfare Integrated Data. This data is usually provided by the provincial social affairs agency. Based on the DTKS data, a total of 14,711 residents were registered in Kampung Melayu.[45] This number indicates that around 44.8% of the total population (around 32,808 people) is classified as vulnerable from a social welfare point of view. Hence, their inclusion in the list of beneficiaries of social assistance in 2022. Some of the flood-affected residents in the Kampung Melayu are beneficiaries of the social protection program. Nonetheless, not all people registered in the DTIKS database would receive assistance, either PKH or BLT. Several respondents mentioned that they knew their inclusion in the DTIKS but had never received any cash assistance. In addition to the DTIKS data,

[43] See ref. transcript of KII of Duit HaPe

[44] Guidelines for Implementation of the 2021 Family Hope Program, Directorate of Family Social Security, Director General of Social Protection and Security, Ministry of Social Affairs, Republic of Indonesia

[45] Jakarta Provincial Social Service. (November 24, 2022). "Data Terpadu Kesejahteraan Sosial (DTIKS)". Available: https://data.jakarta.go.id/dataset/data-terpadu-kesejahteraan-sosial-dtks-provinsi-dki-jakarta

another potential database that can also be used for FBEA planning is the social welfare integrated data or Regsosek (*Registrasi Sosial Ekonomi*) from BPS.

On one hand, the DTIKS is worthy of consideration for FBEA planning, especially in a target area with a quite robust database as in Kampung Melayu. On the other hand, to build a more targeted FbF cash assistance program, it is necessary to verify the data in more detail. This is as in the good practice that has been carried out by WVI in the previous CVP implementation.[46]

A disaggregated dataset also can be used for determining beneficiaries of FBEA and it is available at the village office. As per relevant statistical data collection guidelines, at this level, a disaggregated population dataset should include the number of children and PWDs. They are updated by the Dasawisma's members once every six months. Therefore, in case of imminent floods, the head of RW, in theory, would have known a more precise location of his/her community members, e.g., the location of households with vulnerable members and those potentially in need of social assistance or early action prior to disaster occurrence. However, the study team could not confirm whether the Head of RW would have the necessary manpower to perform systematic early actions.

A survey in Kampung Melayu Village showed that CVP beneficiaries were mostly delighted with the CVP's past implementation, i.e., 57.1% were very satisfied and 14.3% were satisfied. However, 26.6% of beneficiaries are still not satisfied with the CVP assistance they have received. The CVP also provides dual benefits; on one hand for the beneficiaries to fulfill their immediate needs, and on another hand for the sellers of products covered by the CVP. Beneficiaries also expressed their satisfaction with the CVP since it allows them to purchase shoes, children's uniforms, and school equipment.

[46] See ref. transcript of KII of Duit HaPe

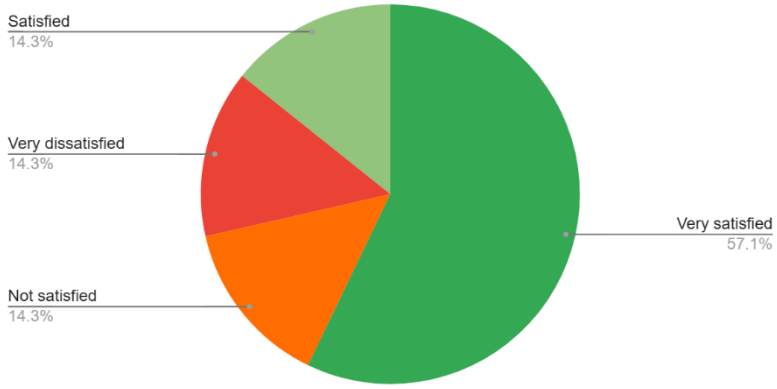


Figure 38 The level of satisfaction with previous CVP in Kampung Melayu Village

Beneficiaries who answered "dissatisfied" to the CVP attribute their reason to the nominal of the assistance, which was perceived as too low and not meeting their immediate needs. They said the CVP assistance only allowed them to purchase groceries and it was not enough to buy children's school needs, e.g., school uniforms. Respondents who answered "very dissatisfied" were in fact did not receive CVP assistance from the WVI, but instead from other party at IDR 200 thousand.[47] The per capita amount was lower than the one provided by WVI. Notably, this was due to a policy to increase the quota of beneficiaries and hence reduce the amount received by each beneficiary. However, affected communities seem to be aware of the reasoning that equal distribution was also aimed at the community's welfare.

4.7 Case conclusion: feasibility & viability of FBEA in Kampung Melayu Village, East Jakarta

According to the findings outlined in subchapter 4.1 to 4.6, this study concludes that there are areas of improvement to increase understanding of early warning and early actions from OPDs down to the community's level. For easier reference, the following figure illustrates the flow of early warning from top to down, including the possible early actions from selected groups in the community as perceived by the KIs. From this illustration, this study also identifies some potential interventions that can be taken by WVI to implement CVP for early actions.

[47] The respondents used the term "…from elderly…"

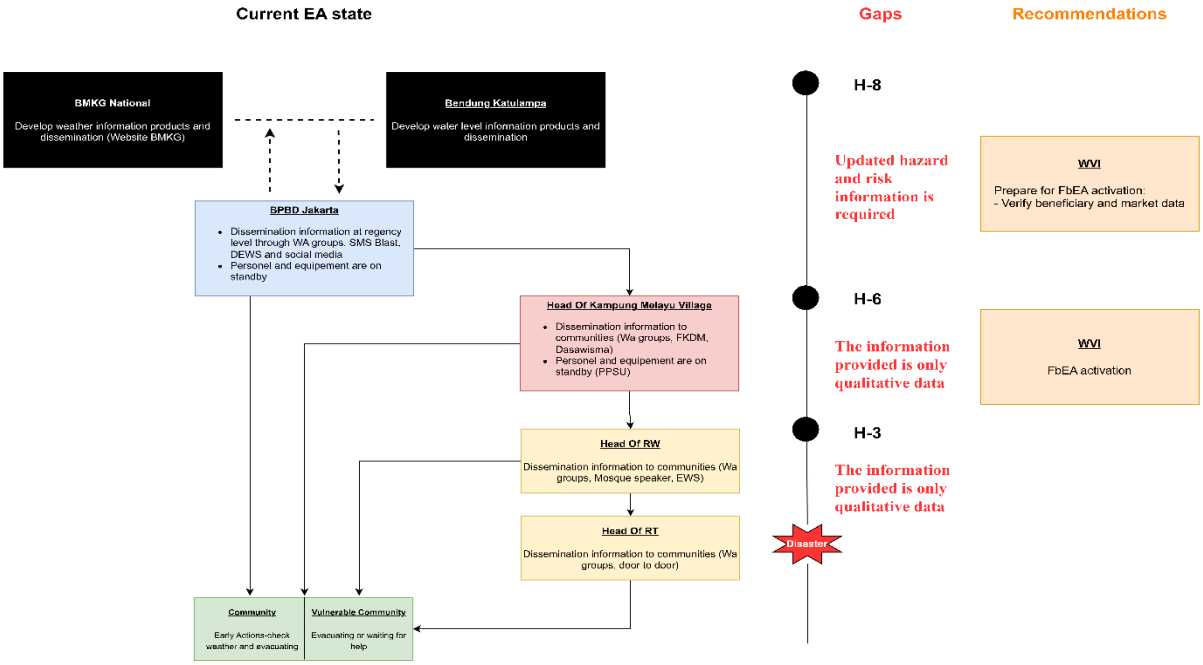


Figure 39 Case summary and gap of FBEA for Flood in Kampung Melayu

Based on several indicators that have been mentioned in the previous sub-chapters, this study concludes that Kampung Melayu already has a relatively high level of understanding of flood risk due to past experiences, functioning early warning, and has a relatively high level of knowledge of early action from local government agencies and the community. Therefore, in case of continuing the FBEA intervention, this study recommends several actions based on the Ideal viability classification adapted from the Anticipatory Action Guide (IFRC, 2023).

Table 17 Viability criteria from AA (Kampung Melayu)

Viability criteria (adapted from AA, 2023)	Compliance in Kampung Melayu & WVI	Qualitative and Quantitative Evidence
Ideal viability for a specific hazard		
An impact-based forecast exists for the prioritized hazard	3	Impact-based forecasts for flooding already exist in Kampung Melayu Village. Weather and climate forecast information is provided in several different timeframes which include seasonal, extreme weather and daily forecasts. However, most of the forecast information is ordinal data type, qualitative (non-numeric) data that groups variables into descriptive categories with hierarchical scale. This type is usually often found in weather forecasts that have a short time span. In contrast to

Viability criteria (adapted from AA, 2023)	Compliance in Kampung Melayu & WVI	Qualitative and Quantitative Evidence
		seasonal forecasts which are more often equipped with numerical information for the potential for rainfall. Information on weather and climate in various timeframes is then complemented by the results of monitoring the water level The status of the Katulampa, Depok and Manggarai sluice gates which always updated and disseminated through various channels (DWS, BPBD Network with village officials, SMS Blast)
There is a well-established early warning system or extreme event forecast that has been assessed to have high accuracy.	4	The early warning system in Kampung Melayu is based on rainfall information, however in a short period of time <24 hours it usually relies more on water level information from several floodgates (Katulampa, Depok and Manggarai).
There is a strong evidence base for the short-listed early actions, based on rigorous evaluations.	5	Through a survey we conducted in early January 2023, it was found that several early actions were taken by the people there, such as 1) evacuating important documents and assets to a higher floor, 2) evacuating vulnerable family members.
There is potential to integrate the FbF trigger model or FbF actions into established social protection systems.	4	In terms of technical readiness, FBF has the potential to be implemented, every time it enters the rainy season and floods are also always accompanied by the governor's direction for handling, including approval for the use of funds at the village level to support preparedness needs, including allowing for social security assistance.
The **WVI's representatives** are thought leaders and able to work closely with technical services, government authorities (e.g., BPBD) and other stakeholders **to establish the FbF system.**	4	WVI has collaborated and initiated several programs in the study areas, some of which are related to CVA, including in flood disaster response, both targeting the community in general and specifically targeting families with school-age children.
The prioritized hazard has been prioritized within the **WVI's strategic plan**	3	There have been many flood-related activities that have been implemented by WVI in the Kampung Melayu area. Some of them are programs related to CVA related to flood response in collaboration with Duit HaPe
There is a high level of buy-in within the technical services (hydro, met) for co-producing an FbF trigger model.	4	There are still no rules or decrees that regulate and indicate commitment from a high level for co-producing an FbF trigger model.

Viability criteria (adapted from AA, 2023)	Compliance in Kampung Melayu & WVI	Qualitative and Quantitative Evidence
There is a functional FbF working group in **the country / city**		There is no working group specifically to function as an FbF in the Kampung Melayu area. However, there are forums related to preparedness that can support this.
There is an established system for collecting data on vulnerability and exposure nationally.	5	Population data is usually updated by village officials and RW/RT on a regular basis and submitted to BPBD when entering the flood season
The prioritized hazard has been prioritized within the local government's **disaster plan** (i.e., RPB)	5	This type of flood disaster is one of the disaster priorities handled by the Jakarta government (BPBD). In the 2018-2022 Strategic Plan Document for the purposes of developing EWS, together with the development and maintenance of the information management system and call center, the budget is around IDR 20 billion per year.

Source: Analysis, 2023

5. Case 2 - Feasibility & Viability of FBEA in Malaipea and Welai Selatan Villages, Alor District

5.1 Overview and brief risk profile of Malaipea and Welai Selatan Villages, Alor District, East Nusa Tenggara (NTT)

This section focuses on the risk profile (including historical disasters with a specific scope of the tropical cyclone) in Alor Regency, especially the two target villages, Malaipea and Welai Selatan.

Past Tropical Cyclones in NTT province

Understanding that tropical cyclones are not a new hazard in the NTT region is imperative. In the last two decades, three tropical cyclones have passed around the East Nusa Tenggara region, as shown in *Figure 40*. The green line shows the movement of the Bonnie Tropical Cyclone in 2002, which passed over land in the Timor and Sumba regions. The yellow line shows the direction of the Inigo Tropical Cyclone in 2003, which passed over land in the Sumba region. Its position is relatively close to the northern islands of East Nusa Tenggara, such as Ende Regency and Alor Regency. Finally, the orange line shows the movement of the Seroja Tropical Cyclone in 2021, which appeared relatively close to the Timor area and the Provincial Capital, namely Kupang. All the tropical cyclone events that passed through the NTT Province occurred in April, triggering flash floods and floods.

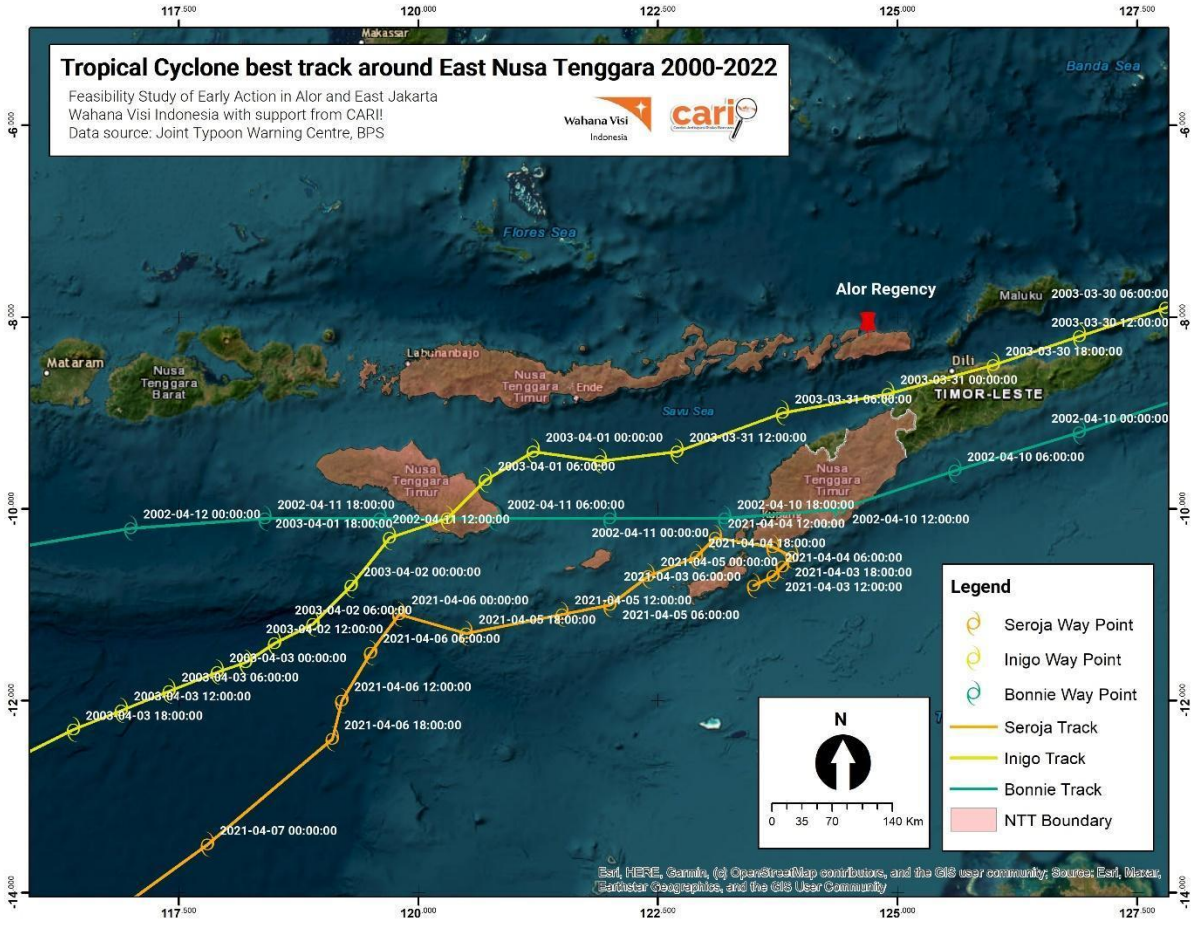


Figure 40 Tropical Cyclone best track around NTT in 2000-2022

Although historical data on the cyclone tracks are available, it is challenging to find complete impact data based on the cyclone events in the past, as indicated in Table *18*. Based on the tracking in BNPB's disaster database (DIBI), only Tropical Cyclone Seroja and its impacts are recorded in the systems. However, the labeling of the event is inconsistent as there is a specific event named 'Badai Siklon Tropis Seroja', and the rest is either 'banjir bandang dan longsor' or 'banjir' with the same date as the Seroja event. In the context of Alor Regency, tracking with the same date as the Seroja event, the impact data is available but is classified as Banjir, Tanah Longsor, Gelombang Pasang, Angin Kencang, instead of 'Badai Siklon Tropis Seroja'. The EMDAT Report 2021 listed Tropical Cyclone Seroja in the top 10 mortality disasters in 2021, along with other disasters (*Figure 41*). As for the 2003 Tropical Cyclone Inigo, the closest one to the NTT region, impact data is available but without information on the extent of the damage in Alor Regency. Furthermore, no impact data was found for Tropical Cyclone Bonnie in 2002.

Table 18 Impact data of tropical cyclone best track around East Nusa Tenggara in 2000-2022

Events	Year	Characteristic	Casualties	Damaged Houses	Remarks
Tropical Cyclone Bonnie	2002	As Tropical Depression turns into Tropical Storm. Peak & Max wind speed: 118 km/h	N/A	N/A	N/A
Tropical Cyclone Inigo	2003	As a Tropical Depression. Peak & max wind speed: up to 62 km/h	Fatalities: 130 Missing: 28 Heavy Injured: 157 Minor Injured: 2356	N/A	Numbers are from Sikka, Ende, and East Flores Regencies
Tropical Cyclone Seroja	2021	As Tropical Depression turns into Tropical Storm. Peak & Max wind speed: 118 km/h	Fatalities: 138 Missing: 61	1114	

Source: DIBI's, OCHA's, AHA Centre's Flash Updates, Bureau of Meteorology of Australia

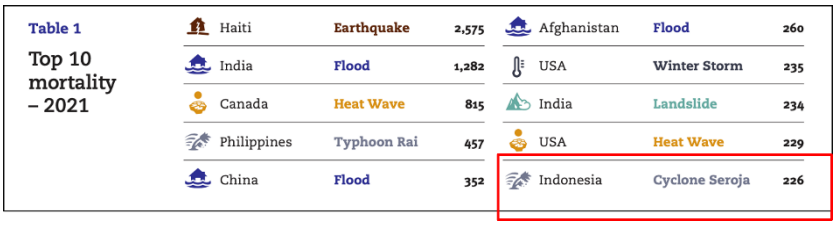


Figure 41 Top 10 mortality disasters in 2021

Source: EMDAT Report, 2021 (Note that numbers are represented persons confirmed as dead and persons missing and presumed dead)

The hilly topography and vulnerable community conditions in Alor made the Seroja cyclone 's disaster impact quite severe. The Tropical Cyclone Seroja path in 2021 did not make landfall through Alor Regency (*Figure 42*). Based on the map on the left, Alor Regency is not in the strong wind buffer area of the Seroja Tropical Cyclone. However, the Seroja Tropical Cyclone intensified the rainfall in Alor Regency, as shown on the Jaxa Global Rainfall Watch map (the right map). Based on the global rainfall model, 24h rainfall accumulation in Alor reached more than 200 mm in a day or equivalent to Alor's accumulation for a month[48]. Extreme rainfall due

[48] See http://www.meteoalor.id/evaluasi_dan_prakiraan_curah_hujan.html

to Tropical Cyclone Seroja in Alor started at 9.00 pm on 3 April 2021 UTC or 5 am local time (GMT+8) on 4 April 2021 (*Figure 43*). This rainfall lasted for 3 hours and resulted in an accumulation of rain reaching 236.5 mm or equivalent to the rain accumulation in Alor Regency for a month. After that, the rainfall gradually decreased, and the total accumulated rainfall for two days reached 301.4 mm. This condition is similar to the extreme rainfall events in Jakarta in 2020, which accumulated 377mm/day and caused flooding as high as 3 meters in Kampung Melayu. The difference is that the hilly topography in Alor triggered more disaster consequences, starting from landslides, floods, and flash floods (Figure 45).

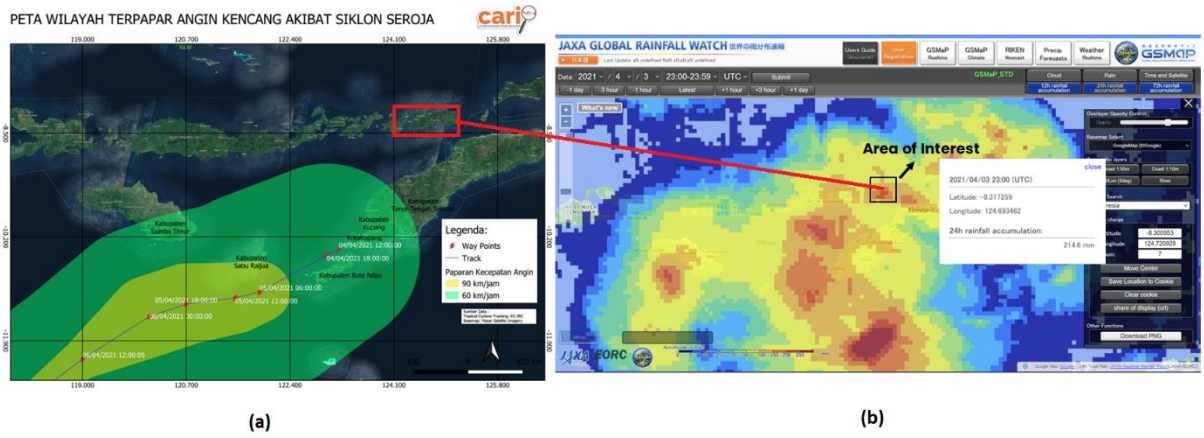


Figure 42 Map of areas exposed to strong winds due to cyclone Seroja (left) and map of estimated rainfall during cyclone Seroja (right)

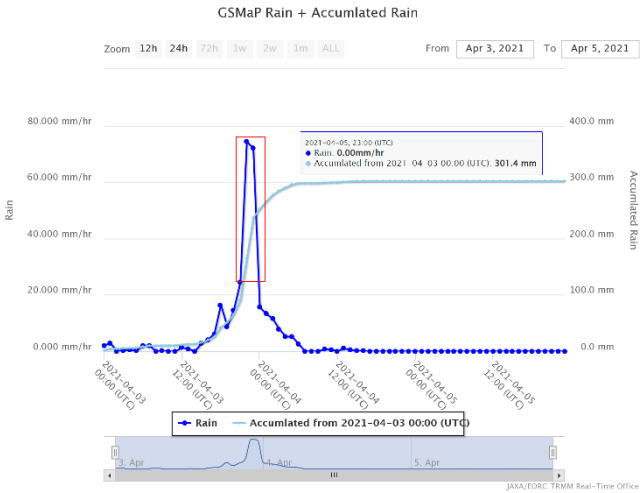


Figure 43 Graph of estimated rainfall and accumulated rainfall in Alor during Tropical Cyclone Seroja

Figure 44 The topographical condition of the hills has trace of landslide due to the Seroja Tropical Cyclone in Malaipea Village, Alor

Both villages were severely damaged during Tropical Cyclone Seroja, even though the data is unavailable in BNPB's DIBI based on the date of the incident. The damage was confirmed during the KII with the social district, where the extreme weather due to the cyclone made the access to both villages cut from Kalabahi city, with a report on one kid who died buried in a flash flood. According to the final report of the Seroja disaster from BPBD (Table *19*), seven people died (one male, two females, and four children), two were heavily injured, and nine minors were injured in Malaipea village due to the Tropical Cyclone Seroja. Meanwhile, in Welai Selatan village, the tropical cyclone caused four people to die (two females and two children), two were heavily injured, and one minor was injured in Welai Selatan Village due to the Seroja. The tropical cyclone also wiped out some neighborhoods in two villages, thus making the location inhabitant, as shown in *Figure 45*. The affected communities relocate to new areas due to trauma. Still, some are not relocating/migrating, considering no vacant land is available except those owned by the government for conservation (Hutan Lindung). As for the public facilities, one school was damaged, but the health facility (Puskesmas) that serves both villages remained intact (Figure 46).

Table 19 Impact Data in Malaipea and Welai Selatan villages due to Seroja 2021

Village	Fatalities			Major Injuries			Minor Injuries		
	M	F	Child	M	F	Child	M	F	Child
Malaipea	1	2	4	2	-	-	4	5	-
Welai Selatan	-	2	2	1	1	-	-	1	-
Total	-	4	6	3	1	-	4	6	-

Figure 45 Neighborhoods in Malaipea village were wiped out during the Seroja 2021

Figure 46 Health facility remained intact (left) and temporary elementary school (right) due to the Seroja 2021

In contrast to Tropical Cyclone Seroja, the impact of weather disturbances caused by Tropical Cyclone Bonni and Tropical Cyclone Inigo are insignificant in Alor Regency. Figure 47 shows rainfall ranging from 1 to 5 mm/hour during Tropical Cyclone Bonni. The total three-day rain only reached 34.7 mm, equivalent to daily rainfall in general. In comparison, the amount of rainfall during Tropical Cyclone Inigo ranged from 1 to 15 mm/hour. The total rainfall accumulation reached 86 mm for three days during weather disturbances of Tropical Cyclone Inigo in Alor. Compared to the extreme rainfall during Tropical Cyclone Seroja, the two tropical cyclones produced relatively less accumulated rainfall. Thus, the weather disturbances in the two cyclones did not cause a disaster in Alor Regency. The absence of recorded impact data from the two cyclones and none of the respondents or household survey raised about this incident can be presumed that the two cyclones did not cause a catastrophe in Alor Regency. However, the similarity of these cyclones is that they all happened in April.

Figure 47 Graph of estimated rainfall and accumulated rainfall in Alor during Tropical Cyclone Bonnie (left) and Inego (right)

Understanding the Characteristics of Malaipea and Welai Selatan villages

Malaipea Village is one of 14 villages in Alor Selatan District, Alor Regency, Nusa Tenggara Timur (NTT) Province. According to the 'Alor Selatan Subdistrict in Figures 2022' document, the village has a 16.07 km2 area that occupies 8.33% of the Alor Selatan sub-district area. It is also found that 4 Rukun Warga and 8 Rukun Tetangga are in the village, comprising 208 households. This landlocked village is bordered by many villages, especially on the southern border with Taman Mataru, Mataru Timur, Mataru Utara, and Kamaifui village. To the north, Malaipea is bordered by Welai Selatan and Tominuku, while on the west border, there is Mataru Barat

Village. On the east, there are Kelaisi Barat and Subo Village. Malaipea is a hilly area with only one river flowing over Anaifu – Mainang Dam.

Welai Selatan Village is in Alor Tengah Utara District, Alor District, Nusa Tenggara Timur Province. The village has a hilly topography of 26.00 km2 (21% of the total sub-district area). According to the Alor Tengah Utara District Figures in 2022 document, this village has 4 RWs and 8 RTs with 206 households. The village is a landlocked village bordered by nine surrounding villages, namely Alim Mebung, Welai Timur, and Fuisama on the northern part, Mataru Utara and Pailelang in the southern region, Tominuku and Malaipea on the eastern part, Welai Barat and Fanating on the western part.

Alor Regency has a Disaster Risk Assessment document at the Regency level; the document shows that Alor Regency has a moderate level of risk of flood, drought and landslide and a high level of risk of a flash flood, earthquake, extreme weather, abrasion, forest fire and land, and tsunami. Although a disaster risk assessment document at the village level is not available, the Alor District hazard map shows that Malaipea Village and Welai Selatan Village are exposed to several hazards, namely flood, flash flood, extreme weather, landslide, earthquake, drought, and forest and land fire.

One factor that affects the degree of disaster impact is demographic characteristics in an area. Table *20* Demographic Characteristics in Malaipea and Welai Selatan shows the demographic characteristics of the two villages. First, the population in Malaipea Village is slightly larger than Welai Selatan Village, with an almost equal population ratio between males and females. Based on the vulnerable age group (total of 0-9 y.o. and >= 60 y.o.), Welai Selatan Village has a larger population of vulnerable groups (n=211) when compared to Malaipea Village (n=186). Although the difference is insignificant, the large population of vulnerable groups increases the vulnerability to disasters; thus, the level of risk will also increase.

Table 20 Demographic characteristics in Malaipea and Welai Selatan

Characteristics	Malaipea	Welai Selatan
Total population	**815**	**751**
Male	408	371
Female	407	380

Age group: 0-4 y.o.	39	33
Age group: 5-9 y.o.	89	108
Age group: 10-24 y.o.	287	241
Age group: 25-59 y.o.	340	299
Age group: >= 60 y.o.	58	70

Source: https://gis.dukcapil.kemendagri.go.id/peta/

The literacy rate in both villages is relatively low. This finding is reflected in the population size based on the area's year of schooling. Table 21 shows that most people needed education in these two villages. They were followed by many populations who only studied up to the elementary level (up to 6 years). Only a few people studied up to high school or university level. Unfortunately, there is no data on the availability and locations of schools in the two villages. The low literacy rate also indicates the community's inadequate understanding of disaster management, particularly before disaster strikes. In addition, based on the field survey, the community in both villages expressed that there has yet to be training and simulation related to disaster management in the village so far. There are also no Community-Based Disaster Risk Management (CBDRM/PRBBK) activities or any Disaster Risk Reduction (DRR) activities in both villages. An Early Warning System (EWS) is not available in both villages. BMKG stated that they do not have a specific tool to detect disaster in Malaipea Village and Welai Selatan Village and that the only warning is from the general weather forecast by BMKG that is disseminated over several WhatsApp Groups, where the head of villages and head of RT are part of the groups. As the community capacity is low, the absence of disaster risk reduction infrastructure, such as warning signs and evacuation route signs, has resulted in insufficient capacity in these two villages.

Table 21 Number of populations by years of schooling in Malaipea and Welai Selatan

Years of Schooling	Malaipea	Welai Selatan
0 year	361	382
6 years	224	174
9 years	90	92
12 years	113	87
>15 years	25	16

Source: https://gis.dukcapil.kemendagri.go.id/peta/

Concerning economic vulnerability, it is important to draw attention to the fact that many residents in the two villages are unemployed, which means they will need more capital to deal with disasters. The indicator within economic vulnerability can describe potential losses as well as the capacity of the community to cope with disasters. Economic vulnerability can be approached by using the number of populations based on the type of work. Table 22 shows that most residents in the two villages work as farmers, categorized as an informal sector. The informal sector is related to the uncertainty of the income derived from the job. Moreover, the agricultural sector is one of the sectors influenced by many external factors, such as natural conditions and natural disasters. When a disaster occurs, people working in the informal sector will experience tremendous stress in coping with disasters because their modal capital is uncertain. In addition, agricultural land is also prone to be affected by disasters such as floods and landslides, making livelihood even more difficult, as expressed by the communities based on the household survey, where many respondents experienced loss of livelihoods and assets such as agricultural land following a disaster.

Table 22 Number of populations by type of work in Malaipea and Welai Selatan

Type of Work	Malaipea	Welai Selatan
Unemployed	**220**	**226**
Student	241	193
Farmer	227	238
Entrepreneur	38	13
Teacher	9	5
State Official	3	3
Others	70	71

Source: https://gis.dukcapil.kemendagri.go.id/peta/

Given a heavy reliance on agriculture sectors with hilly topography, tropical cyclones can generate more impacts that usually trigger strong winds and extreme rainfalls. Strong winds and heavy rains can cause widespread denudation of canopy trees, removal of vines and epiphytes, and the breakage of crown stems associated with tree falls, regardless of the type of plantations. The flash floods that wipe out these materials are a cascading hazard as the debris can injure people and destroy houses. Moreover, these plants and crops are the primary livelihood source of the communities, which makes them unable to harvest their crops, and the lands are required to be rehabilitated. Several studies on the impacts of disasters in agriculture have been

conducted, where they highlighted an early action for farmers that can be considered to save their commodities when they receive early warnings. For instance, Pamungkas (2012) exposed some farmers in Gunung Merapi who harvested salak when the local government released alerts[49]. Few et al. (2017) showcased similar efforts of corn farmers in Ecuador when crops were still at the early harvesting stage due to Mount Tungurahua eruptions[50]. Therefore, this study identifies the need to customize early action programming in these two villages to accommodate their needs/characteristics as farmers. Aside from early action, this study recommends updating the disaster management plan document (RRB) by factoring in the types of plants that are suitable for hilly topography rather than crops that are identical to the main livelihoods of the communities or horticulture plants, as well as identifying safe zone for communities to reside.

For the accessibility aspect, the two villages are landlocked villages with hilly topography as shown in *Figure 48*. The available road connection to Kalabahi Kota (Regency Capital) is around 27.5 km, taking approximately 1 hour and 4 min by car through damaged/unpaved roads that are steep and have no streetlights. Post Tropical Cyclone Seroja, many road access areas are damaged but not yet fully repaired or paved. These conditions certainly complicate the community's ability to access markets in the capital city of Kalabahi pre-, during and after the disaster. Not to mention the added market disruption that will happen when a disaster occurs. These things become a challenge in the community's early actions.

[49] Pamungkas, B. (2012) Economic Resilience of Agribusiness Households in Putih River Region Following The 2010 Merapi Volcanism Events

[50] Few, R., Teresa, M., & Barclay, J. (2017) Living with Volcan Tungurahua : The dynamics of vulnerability during prolonged volcanic activity

Figure 48 Heavily damaged road with a temporary bridge in Malaipea village (left); unpaved road in Welai Selatan village (right)

Regarding sources of data for hazards, vulnerabilities, and exposure, BPBD Alor Regency has Kajian Risiko Bencana for 2018-2022. Nevertheless, there has yet to be an indication of the plan to renew the document due to the unavailable budget and experts to help the agency develop one. CARI! 's knowledge engine portal records three research articles on the tropical cyclone in East Nusa Tenggara. These research articles are 1) the Detection of flood-impacted areas in East Nusa Tenggara using Sentinel-1 imagery; 2) the Influence of ENSO on the variability of rain chain at tropical cyclone in Southern East Nusa Tenggara; and 3) the Analysis of the impact of Tropical Cyclone Blanche on rainfall at Kupang region based on atmospheric condition and satellite imagery. However, research articles that specifically discussed the impact of the Seroja Tropical Cyclone in Alor Regency, especially Malaipea Village and Welai Selatan Village, were not found.

5.2 Availability and quality of hazard forecasting & early warning for Alor District

In general, tropical cyclone forecasting and early warning in Indonesia down to Alor Regency are available. Still, much work to make it effective persists, particularly regarding dissemination and cross-section analysis to trigger early action.

BMKG, as the meteorological, climatological, and geophysical agency, has provided weather and climate forecasting information, including information on early warnings of floods, droughts, and tropical cyclones. Furthermore, the agency has developed a Climate Early Warning System information platform that provides information on early warning of meteorological drought and the potential for extreme rainfall[51]. Meteorological forecasting uses a shorter time frame, namely daily, three days, and weekly weather forecasts. While climatological forecasting information uses a longer time frame, starting from 10 days, monthly, and seasonally. BMKG has also developed an impact-based forecast (IBF), which is weather forecast information that has considered the potential impacts that will occur due to the weather. The IBF system also presents recommendations for responses or steps that must be taken by stakeholders/users or the community regarding the impact of the dynamics of the weather. The component in the IBF system is risk, which is a cross between hazard, exposure, and vulnerability. The magnitude of the risk is highly dependent on the magnitude of the relationship between the three components: the closer the relationship between hazard, exposure, and vulnerability, the greater the risk, and vice versa. The IBF system's risk is constructed in a matrix (risk matrix) to determine the warning level (Figure 49). Based on this matrix, a warning level is created by considering the likelihood and impact.

[51] See https://cews.bmkg.go.id/home.php.

Figure 49 Risk matrix of IBF system

Still at the national level, BMKG has developed a system for multi-generation weather model analysis and impact forecast[52]. The system provides information related to impact-based forecasts covering an area throughout Indonesia. It informs a warning that contains potentially affected areas, potential impacts, a to-do list, and a risk matrix. Meanwhile, the local BMKG also issues impact-based forecasts with a more detailed coverage area scale (Figure 50).

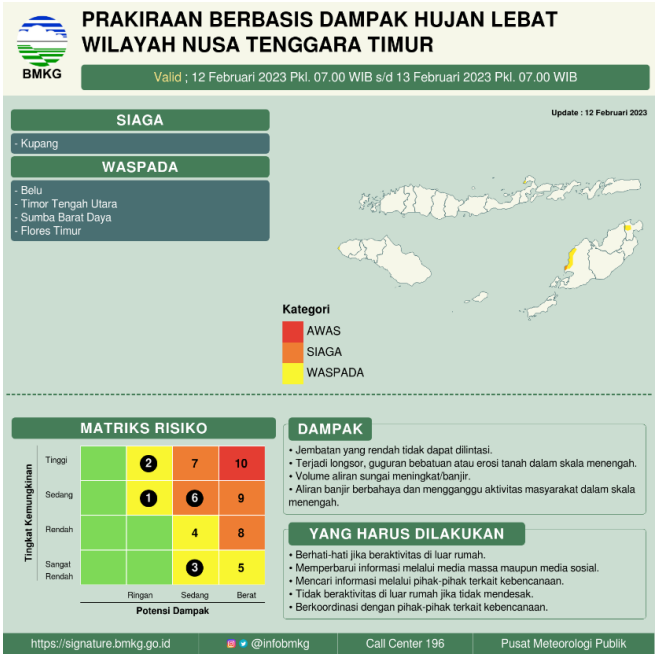


Figure 50 Example of an impact-based forecast information in NTT

52 See https://signature.bmkg.go.id/

Concerning tropical cyclones specifically, a Tropical Cyclone Warning Center is established at the national level to minimize loss of life and property and other impacts of tropical cyclone occurrence by providing an accurate and timely warning to the threatened community. However, there remains a need to insert the role of the BMKG office at the sub-national level and create a protocol and synergy with the national TCWC, as the extent of the center's authority is still unclear. For instance, not all areas in Indonesia are within TCWC's area of responsibility due to international regulations that must be adhered to. For example, Kupang, the capital city of the NTT province, is classified as the TCWC's monitoring area instead of responsibility. Regardless, BMKG at the national level underscores the importance of preparing the communities to anticipate the risks. In addition, BMKG has developed a real-time tropical cyclone warning portal that provides information about current tropical cyclones around Indonesia with information on the cyclone track, coordinates, average wind and pressure, and weather forecasting (*Figure 51*). A tropical cyclone warning system involves at least four parties: meteorological agencies at the local level to deliver the warnings, mass media to broadcast the alerts, disaster management institutions at the national and regional levels to coordinate cross-sectoral disaster management and establish disaster emergency response status, and the threatened community for early actions.

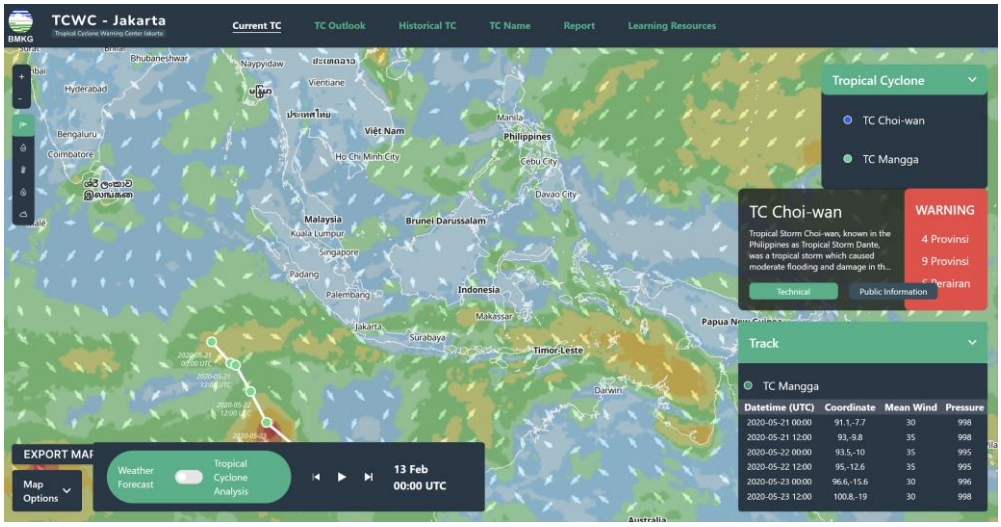


Figure 51 Tropical Cyclone Warning Portal

For early warning of tropical cyclones, BMKG is the sole authority to release the early warning information, not BMKG at the city/district level. Therefore, BMKG at the city/district level only extends the early warning information from the BMKG at the national level to the local stakeholders and communities. When a tropical cyclone arises, BMKG at the national level issues information products through infographics and releases statements that provide information regarding updates to the tropical cyclone (*Figure 52*). Early warning information on

the tropical cyclone issued by the BMKG contains information on the analysis of tropical cyclones, the path of tropical cyclones, general information regarding potential impacts (i.e., extreme sea waves, extreme rainfall, and potentially strong winds > 25 knots), and potential impact areas.

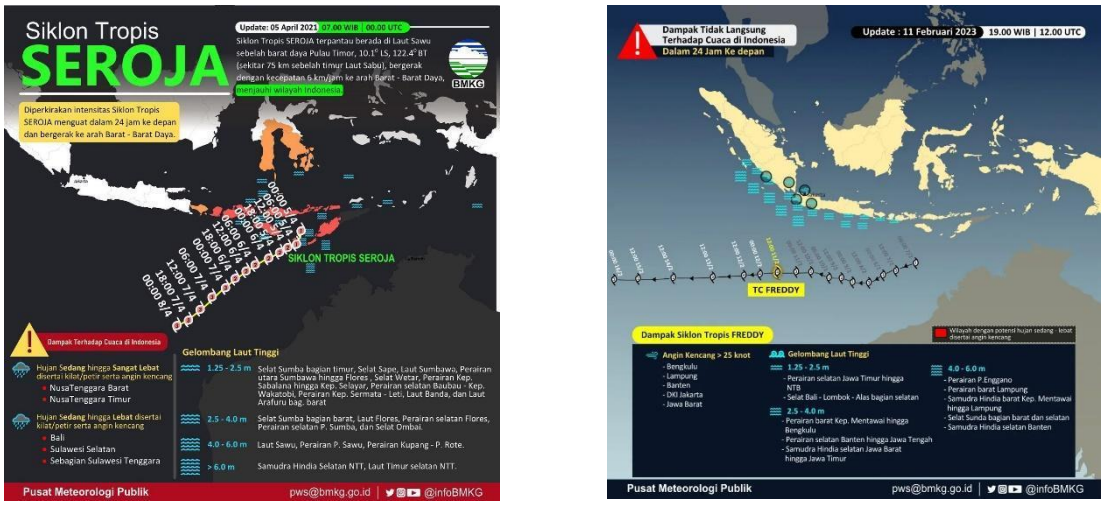
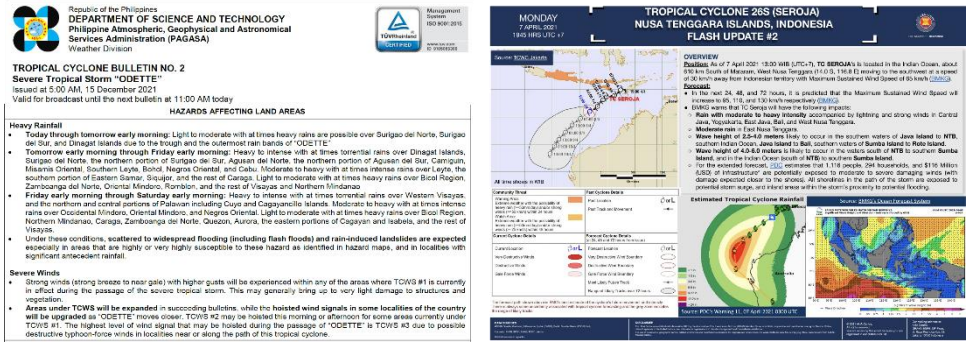


Figure 52 Example of a tropical cyclone early warning infographic issued by the BMKG

Despite the existing warning center and its forecast, the provisions of the BMKG's information need to be more specific for the stakeholders or communities to take early action. For example, BMKG's report contains the cyclone's movement but not to the extent of providing thorough information on the wind speed, estimated rainfall and buffer zone of the potential impact area, among others.

Referencing other similar agencies, in the Philippines' BMKG or PAGASA, the agency releases bulletins outlining thorough information such as potential hazards that may occur following the cyclone with a coherent time frame. Moreover, the data of BMKG still needs to be used for cross-sectional analysis that can estimate the potential impacts and needs for the stakeholders to be aware of and anticipate. Therefore, no available information is shown to overlay the data on the cyclone's movement with the population residing around the dangerous area. For example, the Emergency Operations Centre (EOC) of the ASEAN Coordinating Centre for Humanitarian Assistance on disaster management (AHA Centre) releases flash updates that can provide analysis of the potential impact using various data from government agencies. This analysis is usually released by the EOC of a coordinating center, which the NDMO of the

Philippines also practices. However, such analysis was not provided by either BPBD Alor or BNPB during the tropical cyclone Seroja.



Republic of the Philippines
DEPARTMENT OF SCIENCE AND TECHNOLOGY
Philippine Atmospheric, Geophysical and Astronomical Services Administration (PAGASA)
Weather Division

TROPICAL CYCLONE BULLETIN NO. 2
Severe Tropical Storm "ODETTE"
Issued at 5:00 AM, 15 December 2021
Valid for broadcast until the next bulletin at 11:00 AM today

HAZARDS AFFECTING LAND AREAS

Heavy Rainfall

- **Today through tomorrow early morning:** Light to moderate with at times heavy rains are possible over Surigao del Norte, Surigao del Sur, and Dinagat Islands due to the trough and the outermost rain bands of "ODETTE".
- **Tomorrow early morning through Friday early morning:** Heavy to intense with at times torrential rains over Dinagat Islands, Surigao del Norte, the northern portion of Surigao del Sur, Agusan del Norte, the northern portion of Agusan del Sur, Camiguin, Misamis Oriental, Southern Leyte, Bohol, Negros Oriental, and Cebu. Moderate to heavy with at times intense rains over Leyte, the southern portion of Eastern Samar, Siquijor, and the rest of Caraga. Light to moderate with at times heavy rains over Bicol Region, Zamboanga del Norte, Oriental Mindoro, Romblon, and the rest of Visayas and Northern Mindanao
- **Friday early morning through Saturday early morning:** Heavy to intense with at times torrential rains over Western Visayas, and the northern and central portions of Palawan including Cuyo and Cagayancillo Islands. Moderate to heavy with at times intense rains over Occidental Mindoro, Oriental Mindoro, and Negros Oriental. Light to moderate with at times heavy rains over Bicol Region, Northern Mindanao, Caraga, Zamboanga del Norte, Quezon, Aurora, the eastern portions of Cagayan and Isabela, and the rest of Visayas.
- Under these conditions, **scattered to widespread flooding (including flash floods) and rain-induced landslides are expected** especially in areas that are highly or very highly susceptible to these hazard as identified in hazard maps, and in localities with significant antecedent rainfall.

Severe Winds

- Strong winds (strong breeze to near gale) with higher gusts will be experienced within any of the areas where TCWS #1 is currently in effect during the passage of the severe tropical storm. This may generally bring up to very light damage to structures and vegetation.
- **Areas under TCWS will be expanded** in succeeding bulletins, while the **hoisted wind signals in some localities of the country will be upgraded** as "ODETTE" moves closer. TCWS #2 may be hoisted this morning or afternoon for some areas currently under TCWS #1. The highest level of wind signal that may be hoisted during the passage of "ODETTE" is TCWS #3 due to possible destructive typhoon-force winds in localities near or along the path of this tropical cyclone.

Figure 53 Example of EWS warning from Philippines Atmospheric, Geophysical, and Astronomical Services Administration (PAGASA)

Regarding the EOC and its potential to come up with cross-sectional analysis, BPBD Alor Regency also needs to improve the capacity of the human resources and facilities. The KII with BPBD Alor confirmed that no analysis on the potential impacts and needs was being done from the EOC/BPBD after receiving the early warning from BMKG, considering they need tools to do so, as well as limited resources. Furthermore, the capacity of the EOC/BPBD personnel is identified as a need to be trained, including recruited based on the required skills. Therefore, the early actions of BPBD after receiving the BMKG's initial information are limited to advising the Governor in preparing the status of the incoming incident, issuing warnings to heads of villages, and activating the command post along with its logistics and personnel. Last, the EOC of BPBD Alor is not configured as a common standard operations center that can show the function of the center for command, control, and coordination (Figure *54*). For instance, the EOC usually has basic maps to provide a common operational picture. However, the EOC of BPBD Alor looks empty and underutilized.

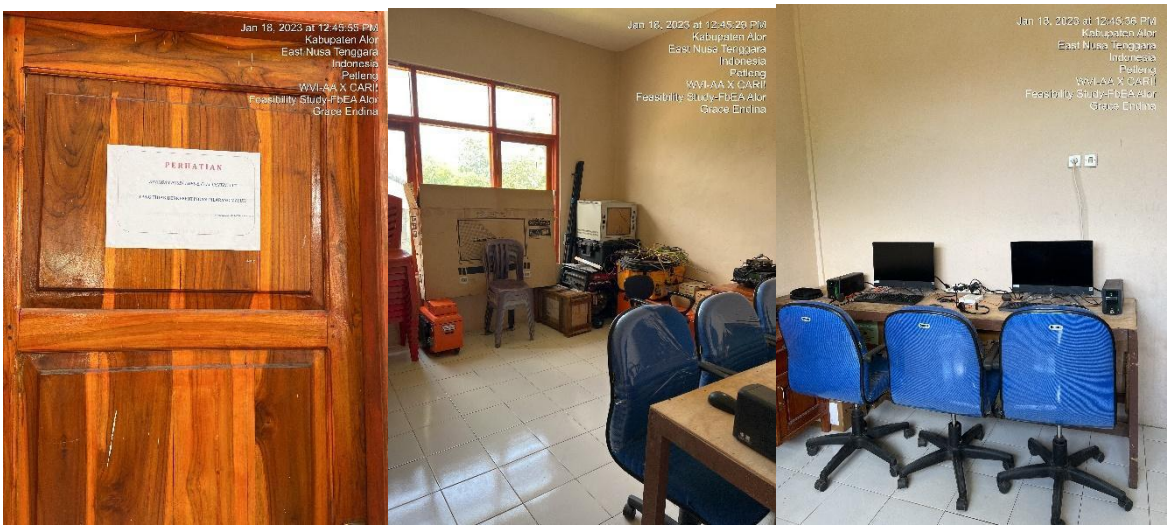
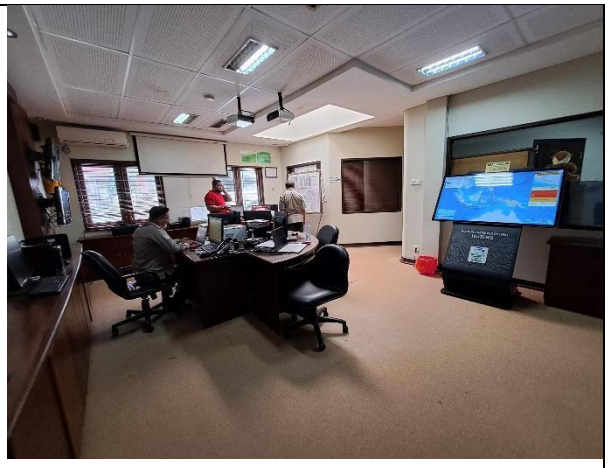
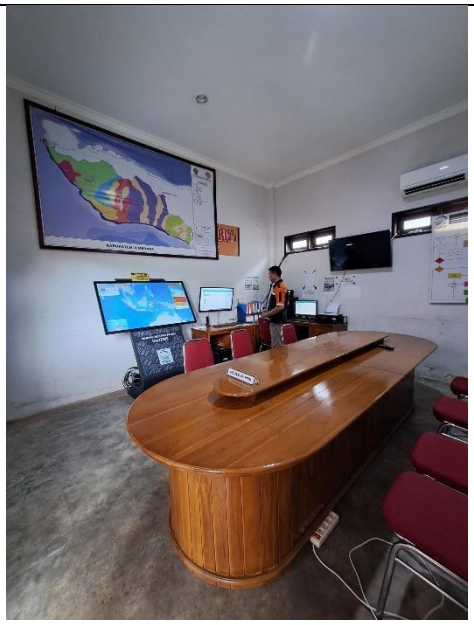
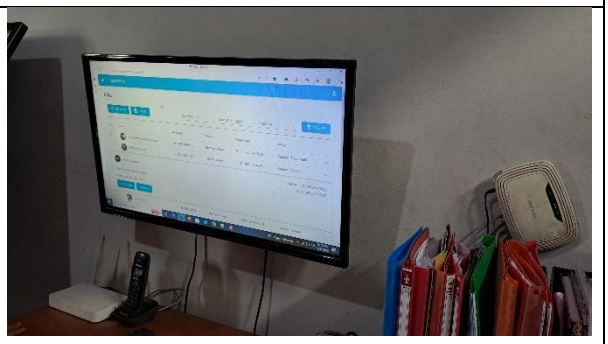


Figure 54 EOC of BPBD Alor Regency (Pusdalops)







Interface of emergency management service app in Tabanan Regency EOC

Figure 55 Examples of EOC in BPBD Bali (upper side) and Tabanan (lower side)

The condition of the early warning system in Alor Regency is relatively minimal. Based on the interviews with key disaster stakeholders, this study found only one landslide early warning device installed directly at the community location. Meanwhile, meteorological hazards only use secondary data from satellite imagery for extreme weather potential and other risks based on stakeholders at the provincial/national level. Representatives of the BMKG Meteorological Station stated that using satellite imagery data also has several limitations, such as low spatial resolution and parallax errors, which lead to inaccurate predictions. As for the Malaipea and Welai Selatan, the early warning system uses traditional tools such as 'Kentongan' and hitting electric poles to signal any danger, including events related to natural and non-natural hazards. Thus, it is believed to be local wisdom from these villages.

The dissemination of the early warnings only uses WhatsApp groups consisting of cross-sectional OPDs, sub-district heads, and village heads. When a potential hazard arises, the regional authorities will inform their respective groups of the potential hazard. The early warning dissemination through the WhatsApp groups could have been more effective. Ineffective dissemination over WhatsApp groups was mentioned in the key informant interviews that there was still potential for hoaxes circulating. Due to network constraints, some village heads did not respond or receive the message. Aside from not being responsive, the KII with BPBD Alor Regency even mentioned the failure of the recipients to understand the message despite receiving early information from the WhatsApp Group.

Nevertheless, another WhatsApp Group, Alor Tangguh, with key actors in the villages, such as the heads of villages, was created by BPBD as a lesson learned from the 2021 Seroja. At that time, many communities still did not receive the message, even though almost all OPDs had their WhatsApp group with the heads of villages and sub-district heads. However, these unorganized dissemination strategies through WhatsApp group platforms are yet to address the issues around network constraints and failure to understand the message. Moreover, having too many WhatsApp groups may be overwhelming for village heads to monitor and digest the information.

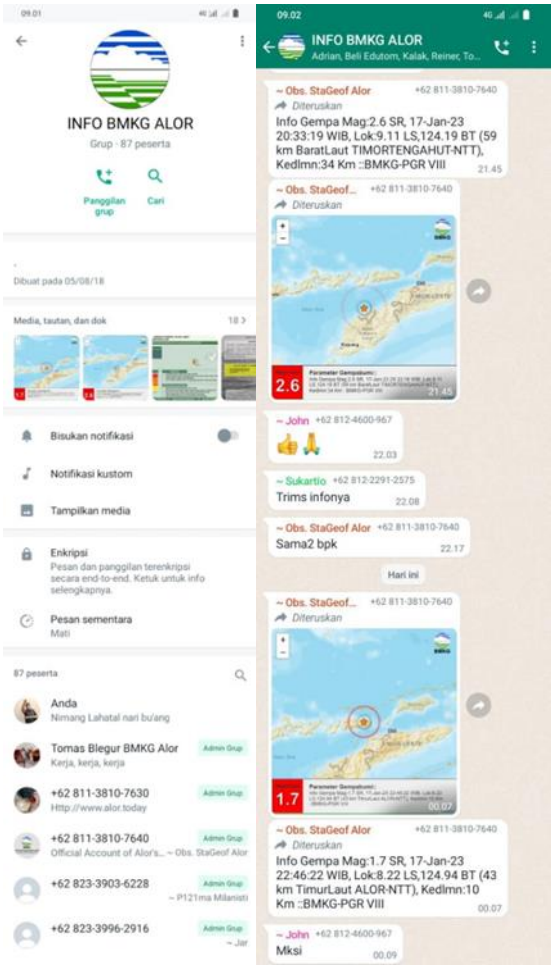


Figure 56 WhatsApp Group INFO BMKG ALOR

The silo approach with limited concrete actions taken following the early warning issued by BMKG is apparent. Based on the KIIs with the OPDs, the answer on what measures were taken during the pre-disaster is only to the extent of forwarding the information, providing advice and warnings, and putting it on stand-by until the disaster occurs. The KII with Social Service and BPBD confirmed that they were not releasing any cash assistance for the potentially affected population as it was not allowed under regulations. In terms of non-state organizations, they must be registered and coordinated under the Bappeda Penelitian dan Pengembangan (BAPPEDA Litbang). However, it is challenging to find non-state organizations focusing on disaster management or implementing the FBEA program in the Alor regency, except for WVI and PMI.

At the community level, based on the household surveys, table 23 shows no association of respondents who have experienced disasters on the behavior of accessing weather/climate information in Malaipea Village based on Fisher's Exact Test result ($p = 0.39$). There 23

respondents in Malaipea Village agreed that they access weather forecast information when the rainy season is about to start, whereas in Welai Selatan Village tends to be uniformity between respondents who answered 'Yes' (16 respondents) and 'No' (16 respondents) regarding access to the weather forecast information (Table 23). However, for Welai Selatan Village, the Fisher's Exact Test could not be carried out because all respondents had experienced disasters. Most respondents in both villages stated that they received weather forecast information from the BMKG and the village government through WhatsApp Groups and SMS. In addition, the number of respondents who checked the weather news on a daily and weekly time frame was mainly found in Malaipea Village compared to Welai Selatan Village (*Figure 57*). Respondents in Welai Selatan Village tend to disagree with checking the weather news in daily and weekly time frames.

Table 23 Crosstab on disaster experience with check weather/climate forecast information

Disaster Experience	**Check Weather/Climate Forecast Information**			
	Malaipea		**Welai Selatan**	
	No	Yes	No	Yes
No	3	3	0	0
Yes	9	20	16	16
p-value	0.391176471		Not applicable	

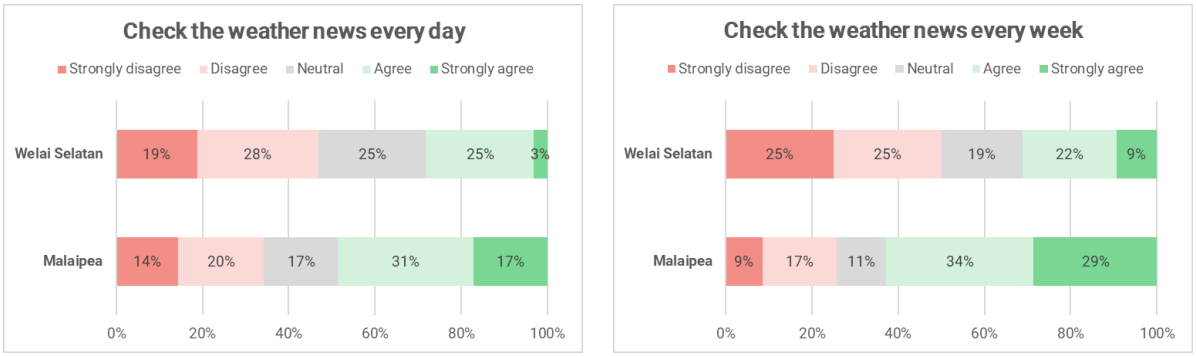


Figure 57 Proportion of respondents who check weather news (daily/weekly)

There are similarities with respondents' answers regarding access to early warning information when a flood/hurricane is about to occur compared to the previous question. 66% of respondents from Malaipea Village answered 'Yes', while in Welai Selatan Village there are only 47% of respondents answered 'Yes'. Most of the respondents in both villages stated that they received early warning information from the BMKG, the BPBD, and the village government through social media, WhatsApp groups, and SMS. Related to the community's response when

receiving a notification/early warning of a disaster, most of the respondents stated that they would be more careful and evacuate earlier to a safer place.

Figure 58 Proportion of respondents who access early warning information when a flood/hurricane is about to occur

Early warning access for GEDSI (Gender Equality, Disability and Social Inclusion) in Alor

The access to the early warning system in both villages could be more inclusive, mainly if the communities primarily rely on *kentongan*. It is interesting to explore how disabled communities can understand *kentongan* if they are deaf or blind. Based on the KII with WVI Alor and PMI, disabled people could sense an emergency arises when they see or hear people start panicking, and that a tendency of a panicked person tends to make a similar sound when they hit the electric pole (*kentongan*) to alert a situation. Furthermore, the evidence is apparent through the results of the household surveys in both villages as outlined in the charts below (*Figure 59*). Most respondents in both villages stated that they did not agree with the capacity of individual vulnerable groups to access early warning information independently. One of the main reasons stated by respondents is that the vulnerable groups cannot access information via mobile devices and for the children, are still underaged and cannot digest information properly.

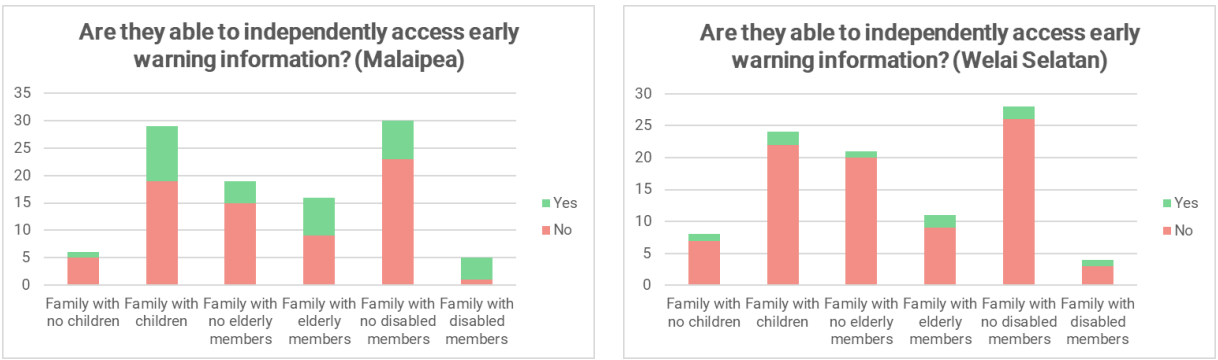


Figure 59 Proportion of respondent's perception of the inclusivity of access to early warning information for vulnerable groups.

Based on the KII with BPBD, there has been a disaster simulation involving children at school in 2020. However, capacity-building programs specifically for children to understand early warning were not found in the two villages. Moreover, most of the respondents stated that children cannot access early warning information independently, so with early actions, it can be concluded that understanding of early action for children is relatively minimal. During the field data collection, the staff of WVI Alor also gave a glimpse of a typical family situation in the villages, where the children are usually left unaccompanied at home because parents are occupied with harvesting activities, including household chores. As a result, children become more vulnerable as they cannot access the early warning information independently while their parents are busy and unable to accompany them 24/7.

Segregated data based on GEDSI in Alor regency is also unavailable on the official website/document, despite the claim of Social Service during the KII, whereas the agency stated its team has collected data on vulnerable communities. Nevertheless, the results of the household surveys show that there are five respondents who have family members with disabilities in Malaipea village and four respondents in Welai Selatan Village. In addition, the risk analysis report by WVI, records that there are 12 disabled populations in Malaipea Village and 7 disabled populations in Welai Selatan Village. The report also records that there are 36 women-headed households in Malaipea Village (out of 221 total households) and 83 women-headed households in Welai Selatan Village (out of 201 total households).

Based on the field observations, there was also no disaster management contingency plan found at the village level, including the mapping of vulnerable groups. In addition, the KII with Social Service also confirmed that the risk mapping is not yet incorporating the data about disabled people. Nevertheless, Social Service has a team named Tenaga Kesejahteraan Sosial Kecamatan (TKSK), which is tasked to gather data and information on disabled communities including photos, family cards, and identity card. This work has also been well coordinated with Dukcapil. For instance, the TKSK team will provide information on disabled people to Dukcapil so that they can help prepare the identity card for those disabled people who do not have one. Social Service also adds that usually other public agencies request directly to them to provide this data when they need it. Hence, there is a clear need for Social Service to have online bank data within the agency that can be used widely. Understanding the risk elements of vulnerable groups, including inclusion of mapping of vulnerable groups in the Contingency Plan is very important to realize inclusivity in early warnings.

5.3 Risk perception and possibility of early actions according to community and stakeholders: past, present, and outlook

Risk perceptions among stakeholders vary from one to another. From the local government perspective, they are aware that Alor Regency is a disaster-prone area with unique regional characteristics that are prone to several hazards such as floods, earthquakes, tsunamis, landslides, and flash floods. Local governments that are directly related to disasters such as the BPBD and BMKG understand disaster risk holistically from the pre-disaster to post-disaster phases. While the other local governments focus more on the during/after a disaster.

The Seroja tropical cyclone has provided valuable experience for disaster issues to build Alor Regency even more resilient to disasters, even though there has not been a significant change after the Seroja struck, particularly in the preparedness/early actions aspects. Based on the results of KII with the local government, Alor Regency holds disaster preparedness and simulation activities every year, in fact the simulation is also implemented in schools to increase awareness and preparedness of the student who hopefully can be transferred to their parents. However, concrete steps/policies related to early actions have not yet been found if there is an early warning from an authorized agency such as the BMKG.

Based on the limited number of KIIs for this study, the non-governmental actors or local NGOs know the hazards in the Alor regency. Still, they carry out minimum disaster management-related programmes. PMI Alor Regency is the only non-government organization implementing a disaster-related programme, according to the KII, with a WVI local team and several OPDs. Local NGOs will only start assisting if a disaster has taken place. This reactive approach is also observed within WVI Alor, where the organization has only performed emergency responses due to the 2021 Seroja and COVID-19, despite its existence for over a decade. Most of WVI Alor's programmes are related to stunting, and empowerment of handcraft communities (tenun) and village-owned enterprises, even though there were several cyclones in the past. Therefore, finding local NGOs with disaster management/disaster risk reduction portfolios other than PMI was also tricky. Nevertheless, WVI and PMI Alor Regency have had the experience of implementing cash voucher programmes during emergency responses and early action for PMI.

Based on the household surveys, the community knows their area is prone to disasters, particularly landslides and floods (Figure *60*). This finding is inseparable from the fact that most

of them have experienced disasters before, especially the disaster caused by the Seroja Tropical Cyclone. In Malaipea Village, most of the respondents felt aware that the location where they lived was not very safe from potential hazards. Meanwhile, in Welai Selatan Village, many respondents needed clarification about potential hazards in their area. However, the percentage of respondents who were aware that their place of residence was unsafe from potential hazards was still more significant than those who felt safe. Thus, most of the respondents are worried about their safety and health first, then the loss of their assets and livelihood (Figure 61).

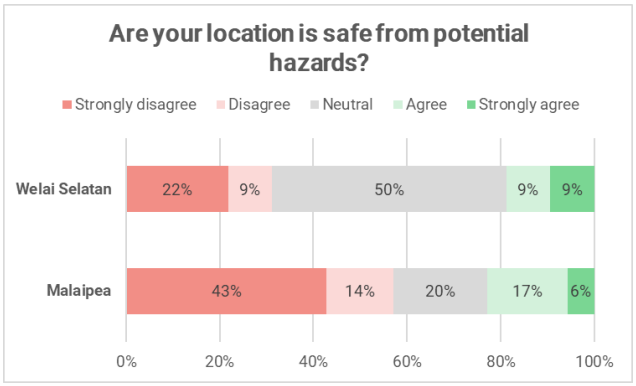


Figure 60 Proportion of respondents regarding awareness of potential hazard within their area

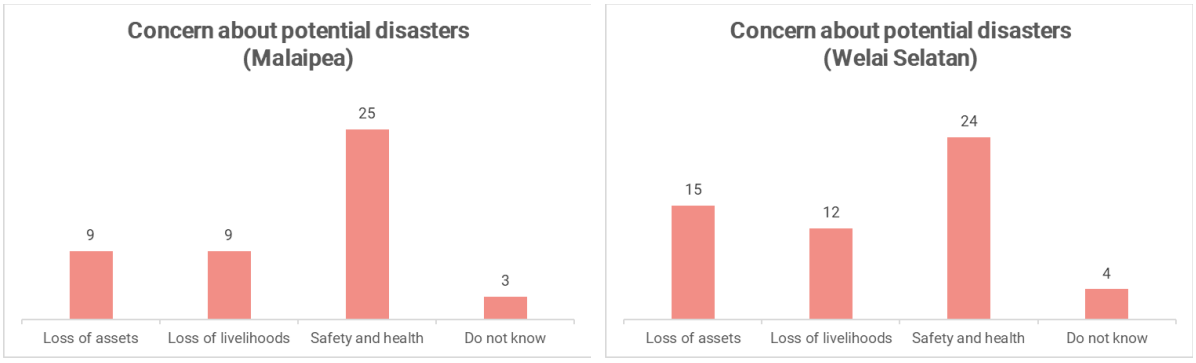


Figure 61 Proportion of respondents regarding their concern about potential disasters

Risk Perceptions vis-à-vis GEDSI

These two villages lack early warning facilities and infrastructure based on field observations, such as potential hazard signs, evacuation route signs, evacuation sites, sirens, etc. When the communities were asked about the early warning systems, their responses were primarily related to the *kentongan* they use to warn the community in times of danger and their observation of the weather, which are believed to be the local wisdom among the communities. In addition, in general, the lack of capacity building for disaster preparedness makes the communities in the two villages vulnerable due to a lack of understanding of disaster risk

reduction, especially during the pre-disaster phase. This finding can be seen in the figure below that in general, most of the communities in both villages had never participated in activities related to disaster preparedness. Nevertheless, only one female respondent participated in disaster preparedness activities in Welai Selatan Village, and no female respondent who participated in disaster preparedness activities was found in Malaipea Village.

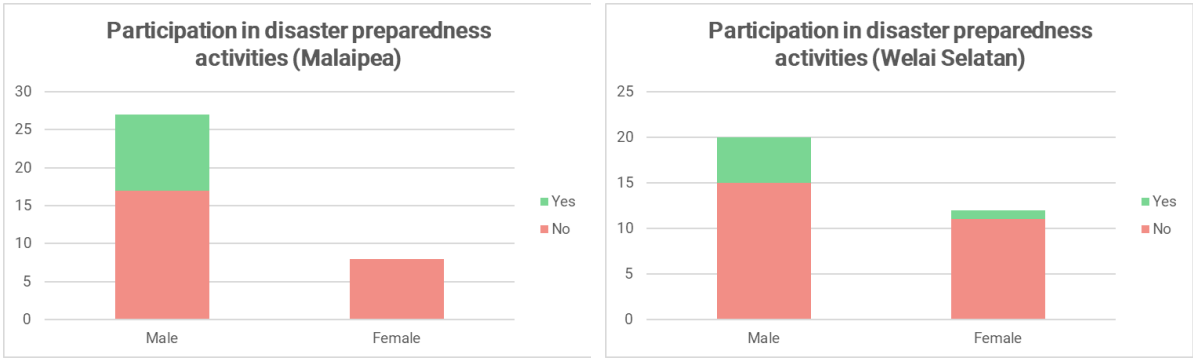


Figure 62 Proportion of participation in disaster preparedness activities.

Table *24* shows the linkage of gender, communication tools, and level of education to the early action variable after receiving early warning information. This table shows that gender does not affect someone to do early action when getting early warning information in both villages (p-value > 0.05). However, there is an association between having telecommunication tools and early action after receiving early information in Welai Selatan Village (p-value < 0.05), but the relationship between the two variables is not significant in Malaipea Village (p-value > 0.05). In terms of education level, no pattern is found that shows the higher the level of respondents' education, the more likely they are to take early action after receiving early warning information (*Figure 63*).

Although there is no causal relationship between gender and early action, as mentioned previously, the social norms in the two villages are mainly patriarchal. An observation was made during the field data collection in both Melaipea and Welai Selatan villages. The women in the communities were preparing the lunch and would only have lunch when all the guests had finished eating. Nevertheless, no significant gaps in understanding the early warnings and actions were observed during the informal conversations with the women groups who prepared the foods and the group respondents. Therefore, this study cannot explore more about the GEDSI component as, in general, the understanding of the communities towards early warnings

and early actions is limited and thus requires more time to digest the questions asked during the household survey.

Table 24 Crosstab on gender and having telecommunication tools with early action after receiving early warning information

Gender	Early action after receiving early warning information			
	Malaipea		Welai Selatan	
	No	Yes	No	Yes
Male	16	11	10	10
Female	4	4	5	7
p-value	0.700273031		0.725669423	
Having telecommunication tools				
No	1	1	0	7
Yes	19	14	15	10
p-value	1		0.007689871	

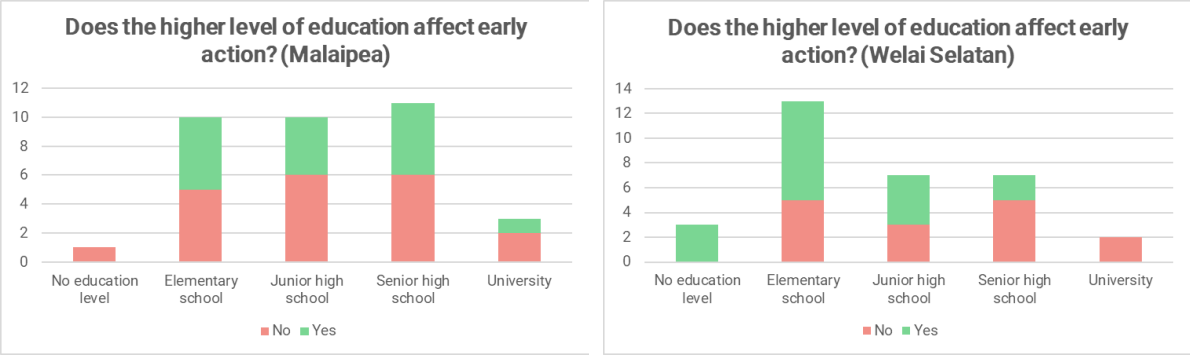


Figure 63 Number of respondents based on education level vs willingness to early action

Perception of Early Actions

When receiving early warning notifications, many respondents in the two villages stated that they would evacuate early to a safer place (*Figure 64*). However, based on the field observations, it is unclear where they want to evacuate because a temporary evacuation site is yet to be determined. In addition, there were no evacuation route signs or temporary gathering points in the two villages. Therefore, the other three types of answers cannot be categorized as early actions. This survey result indicates that the community in the two villages needs to become more familiar with early actions, especially those related to cash voucher programs.

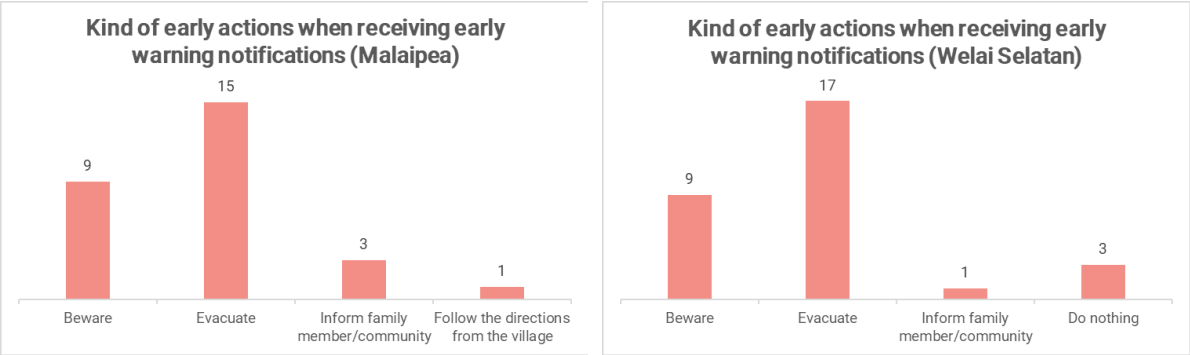


Figure 64 Proportion of kind of early actions when receiving early warning notifications

When asked about what potential early actions to take when a disaster is about to occur, the answer is similar to the previous question (*Figure 65*). Many respondents will evacuate in advance when they know a disaster will occur. However, a small number of respondents are aware of early actions related to withdrawing cash and buying necessary goods, including preparing food items for availability during a disaster. Therefore, an introduction to the types of early action related to the cash voucher program is highly recommended to increase public understanding regarding early actions.

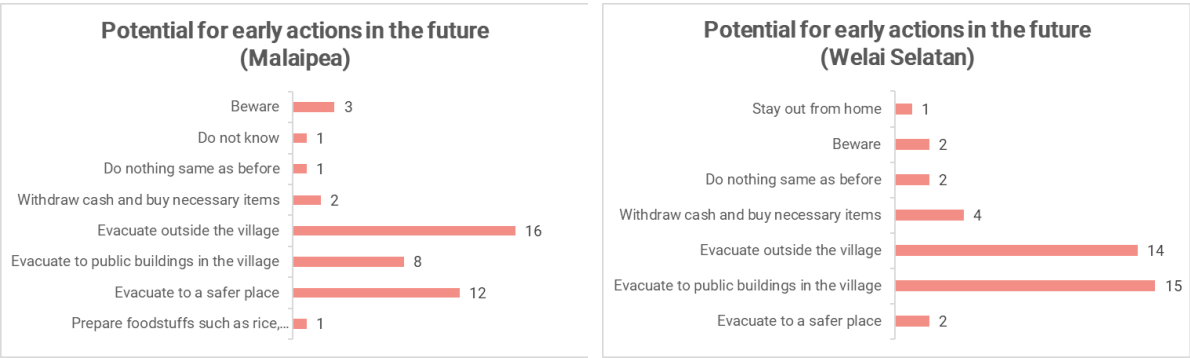


Figure 65 Proportion of potential for early actions in the future

As a form of early action, the cash voucher program can allow the community to buy goods/services needed when a disaster occurs. *Figure 66* shows that most respondents will use the cash voucher program to purchase primary goods, such as groceries, food and beverages, and clothes. However, they also consider medical and educational needs as secondary options. In addition, some respondents will use it for business/work capital and buying building materials. Finally, a few respondents will use the cash voucher program for savings and other purposes.

Figure 66 An overview of the types of goods/services to be purchased using the cash voucher program (past)

Similar to the respondents' answers to using cash vouchers in the past, *Figure 67* shows that in the future, most will use cash voucher programs to buy primary needs as the first option, such as groceries, food and beverages, and clothes. Then they will use it for educational and medical purposes. Finally, some respondents will use it to buy building materials because of their experience during the Seroja Tropical Cyclone; the flood damaged several houses.

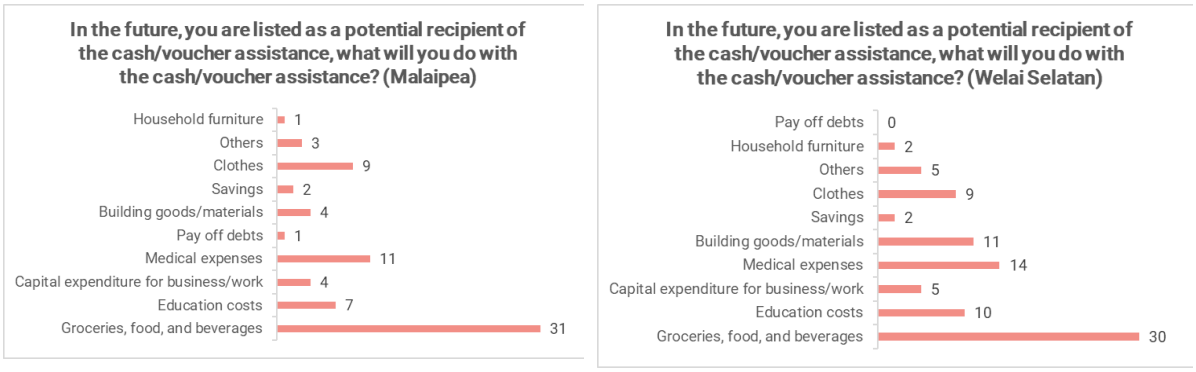


Figure 67 An overview of the types of goods/services to be purchased using the cash voucher program (future)

Most of the respondents put their trust in the village head and local government, as shown in *Figure 68*. Although most respondents agree that village officials have disaster management plans, in fact no contingency plans or village regulations were found in the two villages related to disaster management. The community and village empowerment local agency representative stated that regarding village regulations, not a single village out of 158 villages has a Village Regulation (Perdes) on Disaster Management[53]. Furthermore, the representative also stated that disaster management had not become a priority for the village. Based on field observations

[53] See KII with DPMD Kab Alor

and key informant interviews, Alor Regency still needs a contingency plan for disasters other than earthquakes, especially for cyclones.

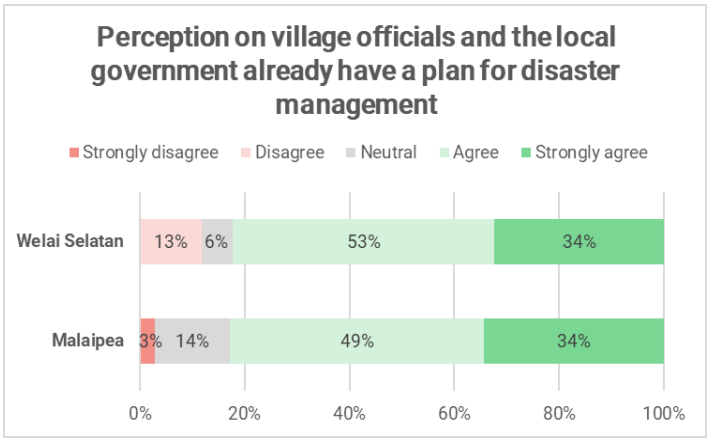


Figure 68 Community perception on village official and local government for disaster management

Lastly, the community is also aware of the existence of NGOs to assist them in disaster management (*Figure 69*). This finding was because many local NGOs came to help the community during the disaster emergency response. However, no local NGOs specifically had disaster management programs in Alor Regency, except for PMI Alor Regency. Thus, community assistance programs for disaster risk reduction in the pre-disaster phase were very few to find. Furthermore, when asked what the communities needed from NGOs, some respondents said they required disaster training and simulation besides essential assistance (food, fresh water, etc.).

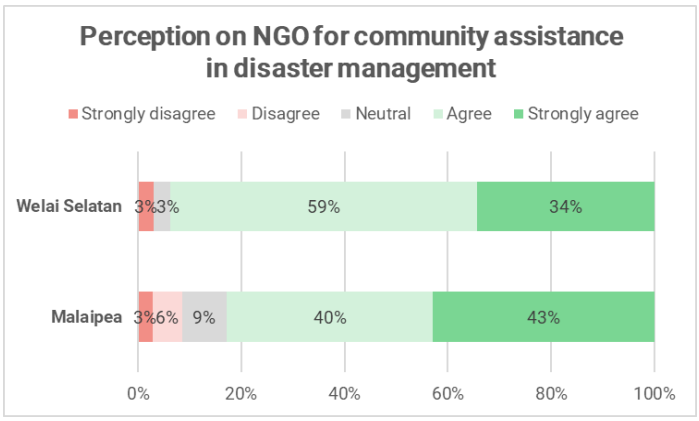


Figure 69 Community perception on NGO for disaster management

5.4 Institutional capacities and processes

WVI Alor has a strong relationship with the local government, including the mayor, and heads of villages, including the communities, due to its lengthy existence of fifteen years. However, in terms of capacity, WVI Alor only has a few local staff that are recruited on an ad hoc basis, or when there are projects implemented in Alor. Administrative and strategic support is not within the scope of WVI Alor, but in WVI Kupang, which is responsible for overseeing WVI's portfolio for the eastern part of Indonesia and Alor. For the FBEA Project in Alor, there are only two staff with no volunteers available to implement the FBEA project. WVI Alor has strong relationships with key stakeholders and communities and can potentially help WVI Alor in implementing the project, despite its limited resources. Nevertheless, FBEA project is WVI Alor's first project related to disaster risk reduction implemented in Alor Regency, even though the area is prone to disasters and has experienced cyclones before the 2021 Seroja.

In times of crisis, such as in the case of the 2021 Seroja, WVI has had existing emergency funds named National Emergency Preparedness Response Funds (NIPRF) that can be accessible based on the internal analysis of the extent of the emergency. Aside from the funds, WVI has also had the prepositioned relief items that can be deployed anytime. All WVI staff, including the local project staff in the Alor Regency, are aware of this internal system and process. In terms of CVP during emergency response, the following is the process of implementing the cash assistance in WVI (*Figure 70*), as will be explained further in the next subchapter.

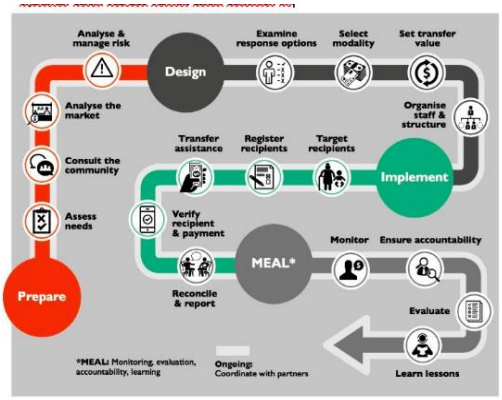


Figure 70 CVP Process

In terms of WVI's commitment to implement early action, the FBEA project is rather used to assess the viability of early action in the form of CVP intervention in Indonesia, with Alor Regency as one of the case studies. Depending on the internal decisions upon this feasibility

study, indicators and number of beneficiaries have been set within this project, one of which is targeting poor families that are not PKH beneficiaries.

As for BPBD's capacities, the agency faced difficulties in early action due to internet/communication and access constraints and a lack of community awareness about a disaster. At the same time, BPBD confirmed that a very minimal simulation exercise was provided. Furthermore, BPBD also mentioned that the limited communication and access impacted the quality of the delivery of relief items, which were not based on needs. Therefore, BPBD took several strategies, such as providing a WhatsApp group with crucial actors at the village level, creating a cross-sector team trained to be on standby for evacuating communities, and conducting a continuous simulation exercise and education about a disaster.

5.5 Financing capabilities of communities, WVI, and relevant stakeholders

WVI Alor has had experience providing CVP to the communities several times following the Moringa and Seroja emergency response and the COVID-19 response. In addition, they use LMLS, which is also accessible to WVI Kupang as the regional office, to track the disbursement of the funds, including the beneficiaries. Although WVI Alor did not mention how much the allocated budget to implement the overall FBEA project in Alor, they indicated that the budget for the CVP per household is IDR 1.200.000 and that the project has given a budget to support the development of regulations at the village and regency levels. Nonetheless, the funding arrangement relies on the donor with the ongoing project with WVI Kupang/Jakarta—thus, a donor-driven/top-down approach instead of initiated by WVI Alor. The current FBEA funding in Alor will last for 15 months until 2024, and it is still being determined if there will be other funding sources in the pipeline once the project is concluded. Therefore, financial management concerns did not appear during the interviews as this was the first time Alor Regency conducted FBEA.

Based on WVI's CVP experiences in these two responses, the beneficiaries are determined based on a set of indicators or criteria in the LMLS system. This indicator differs from one project to another. For instance, the requirements for the COVID-19 CVP are first is disabilities, second is women's households, third is elderly, fourth is pregnant women, and last, those vaccinated. These indicators are then communicated/socialized to the communities so that they are aware

of the purpose of this program and to seek input from the communities if they prefer cash assistance or distribution of food/nonfood items. The communities opted the cash assistance, which is also preferred by WVI Alor Regency, considering the limited availability of vendors/suppliers at the village level. Subsequently, the indicators are given to the heads of villages for them to propose the list of the households' names to the WVI Alor Regency.

Aside from the indicators, the beneficiaries must have an identity card number. Suppose they do not have one, which is a common issue in Alor Regency due to cultural phenomena, WVI Alor Regency will request the head of the village to provide the justification letter, including coordinating with Social Service and Dukcapil for registering the beneficiaries without identity cards. WVI Alor Regency will examine the list of households proposed by the heads of villages to ensure that the potential beneficiaries meet the criteria/indicators. Once WVI Alor Regency verifies and agrees on the list, the team, alongside the head of villages, will announce the beneficiaries by putting the list in the village hall and allow a period for the communities to raise their voices if they disagree with the list. When no complaints on the list of beneficiaries arise from the communities, WVI Alor Regency then submits the list to the village financial institution that has partnered with them to open bank accounts and deposit the cash into the savings of the selected beneficiaries.

Despite the availability of WVI's business process for implementing CVP, some processes did not take place during the CVP for the 2021 Seroja due to time constraints. The personnel also admitted that the implementation of CVP was deemed delayed and thus rushed. Initially, WVI Alor Regency considered providing nonfood items assistance. Still, many stocks were unavailable considering damaged access in Alor Regency and the shortage of supplies as many local NGOs and other organizations purchased the same things. Therefore, WVI Alor Regency recalibrated intervention and chose the CVP as they got a sponsor from Lion Group. WVI Alor Regency then simplified the criteria, cut the socialization of the requirements, and did not announce the list of beneficiaries so that they could speed up the distribution of the CVP. Unlike the CVP for the Covid-19 response, the beneficiaries are not based on households.

Nonetheless, to ensure implementation accountability, the primary indicators are death tolls, damaged houses (heavy, moderate, and light), injured, and then damaged livelihood. Therefore, WVI Alor Regency collected data based on these indicators from the affected villages. Currently, WVI Alor Regency has had a budget for CVP for early action instead of emergency

response as practiced, which is implemented under this FBEA project and will last for 15 months until 2024.

The financing capabilities of communities are heavily reliant on the agricultural sector. Most of the respondents in Malaipea Village are farmers (N = 25). This finding is inseparable from the village's geographical conditions, which are dominated by agricultural land. Two respondents worked as village officials, one respondent as an agricultural extension worker, one as a housewife, one as an honorary teacher, and one as a farmhand. Based on the monthly income range, most of the respondents had a monthly payment of IDR 1 to IDR 1,500,000, and there are two respondents with a monthly income of more than IDR 1,500,000.

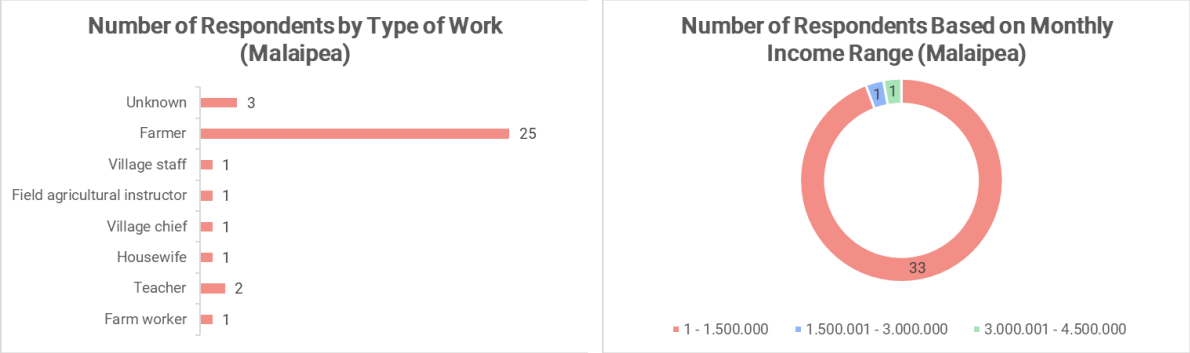


Figure 71 Number of Malaipea Village respondents by occupation and monthly income

Similar to Malaipea Village, there are 20 respondents as a farmer (N = 20). The others are two respondents who worked as village officials, one respondent as security, four as housewives, and five respondents whose type of work was unknown. Based on the monthly income range, most of the respondents had a monthly payment of IDR 1 to IDR 1,500,000, and there are two respondents with a monthly income of more than IDR 1,500,000.

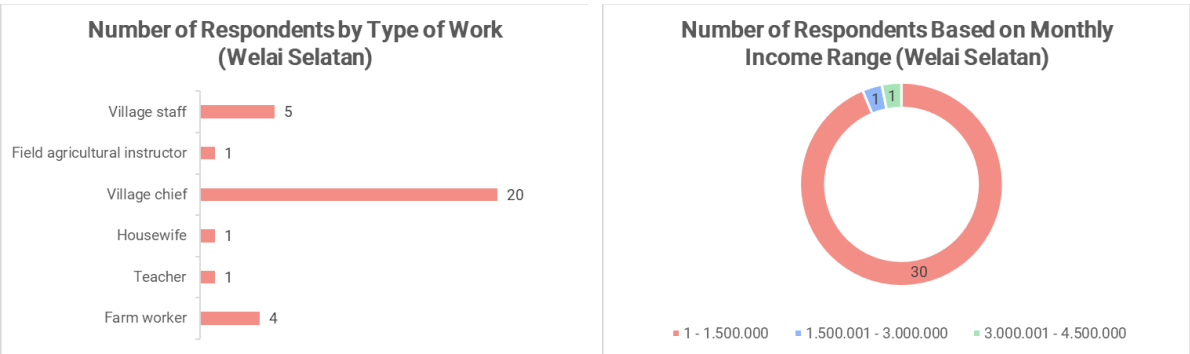


Figure 72 Number of Welai Selatan Village respondents by occupation and monthly income

In Malaipea Village, most respondents are classified as a monthly payment (n = 14) and irregular (n = 14). This is because most respondents work as farmers whose livelihoods are uncertain or follow the harvest month in accordance with their respective commodities. There are also respondents who get daily income (n = 4) and weekly (n = 3). Most respondents do not have savings (n = 22) when compared to respondents who have savings of only 11 respondents. The savings value of most respondents is in the equivalent category with income less than a year (n = 18 or 51% of total respondents). There are 7 respondents (20% of total respondents) who have a savings value equivalent to one year's income, while 10 respondents are unknown.

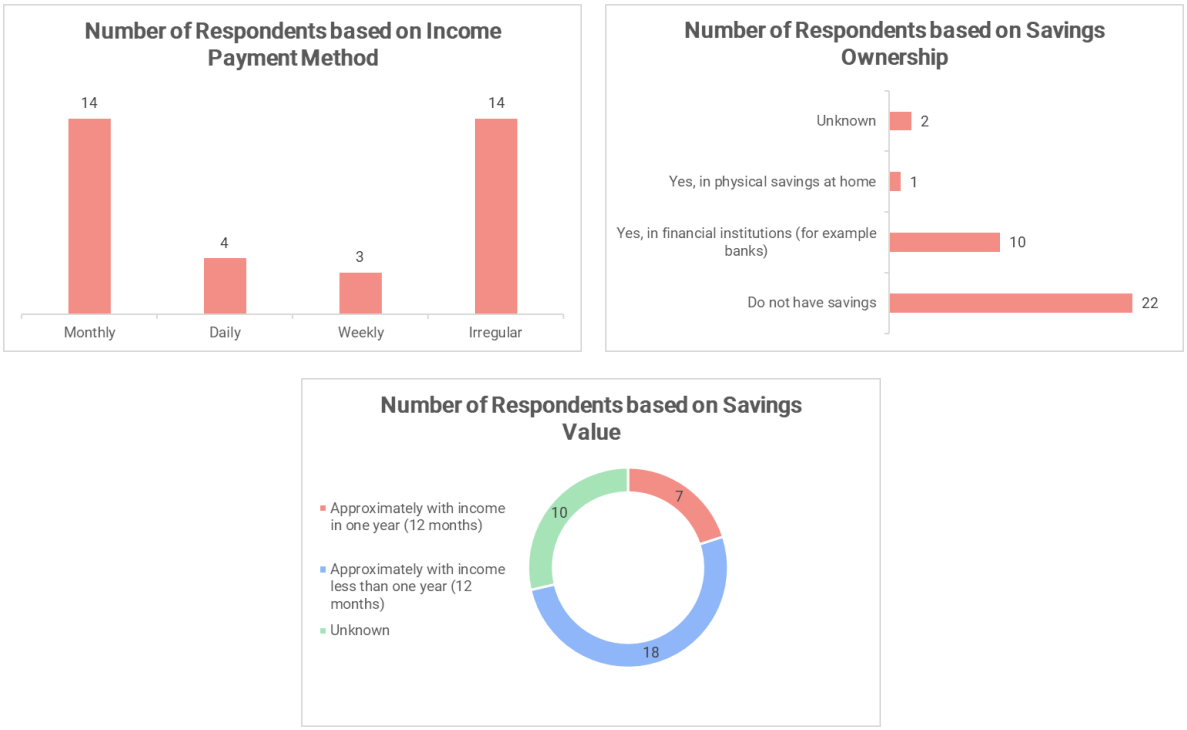


Figure 73 Number of respondents based on income payment method, saving ownerships, and savings value in Malaipea

While, for Welai Selatan Village, most respondents are classified as having irregular payment methods (n = 23), as most of them work as farmers whose livelihoods are uncertain or follow the harvest month per their respective commodities. Nine respondents earn income based on monthly. However, most respondents do not have savings (n = 27) compared to respondents who have (n = 5). The savings value of most respondents is in the equivalent category with a much higher income than one-year income (n = 11 or 34% of total respondents) and less than a year (n = 10 or 31% of total respondents). Three respondents (9% of total respondents) have a savings value equivalent to one year's income, while eight have an unknown category value.

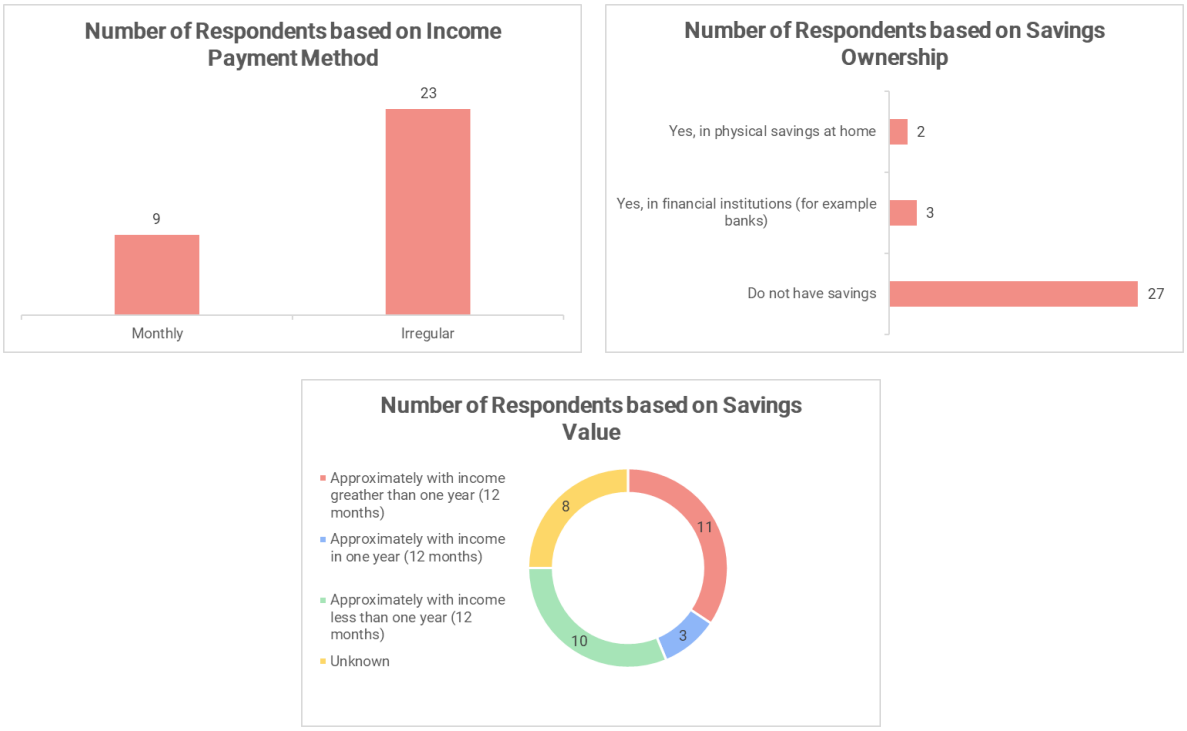


Figure 74 Number of respondents based on income payment method, saving ownerships, and savings value in Welai Selatan

Figure 75 depicts that respondents' perceptions of their capacity and assets to deal with disasters do not show a significant difference between whether they are confident about their capacity or are not sure about their capacity, especially those in the income group of IDR 1-1,500,000. Those who answered neutrally and disagreed wondered whether their capacity and assets were sufficient to deal with a disaster. In addition, several respondents said they needed preparation/capacity to deal with disasters.

Figure 75 Perception on availability of the capacity, assets, and cash needed to cope with the disaster based on income group

Communities in both villages are aware that programs related to cash vouchers or assistance in the form of cash will help them deal with disasters, emergency response and disaster recovery (Figure 76). Most respondents agreed and strongly agreed regarding their perception of whether cash vouchers or cash assistance programs could help their communities deal with disasters. Only a small number of respondents stated that they strongly disagreed with assistance in the form of cash.

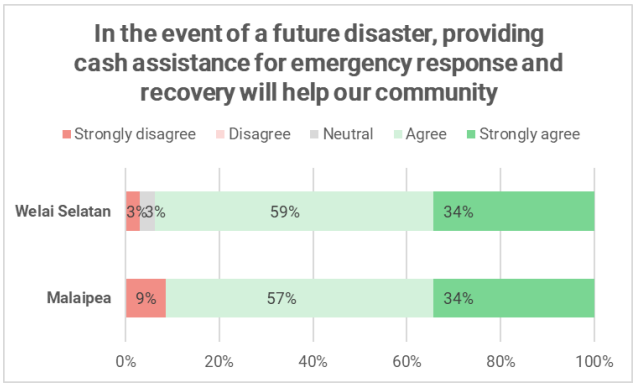


Figure 76 Community perception on cash voucher or cash assistance programs for disaster

Although most respondents strongly agreed and agreed with cash assistance for disasters, half of the respondents in both villages were concerned about access to cash assistance in the future. There are potential difficulties that are being affected by respondents, such as reach and access to disbursement of assistance/vouchers, which are generally in the regency capital (Kalabahi City). Respondents also stated that they need the savings books as a medium for cash assistance. Some respondents also need help understanding the mechanism and flow for accessing cash assistance.

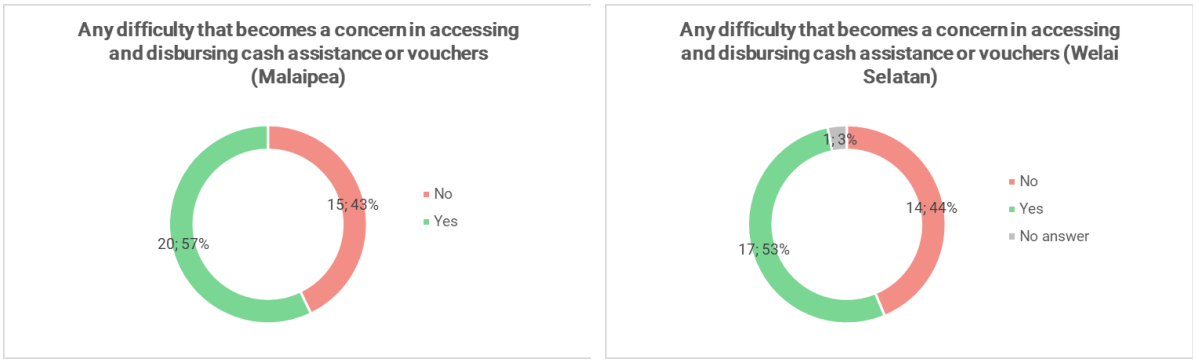


Figure 77 Community perception on cash assistance or cash voucher program difficulties

Figure 78 provides an illustration regarding the amount of cash assistance expected by respondents during the emergency response period. As most of the respondents in the two

villages have an income range ranging from Rp1-Rp1,500,000, it affects the expected amount of cash assistance which is the same as the minimum wage in Alor Regency (around Rp1.900.000 – Rp2.000.000). There are also respondents who expect less or more than the minimum wage.

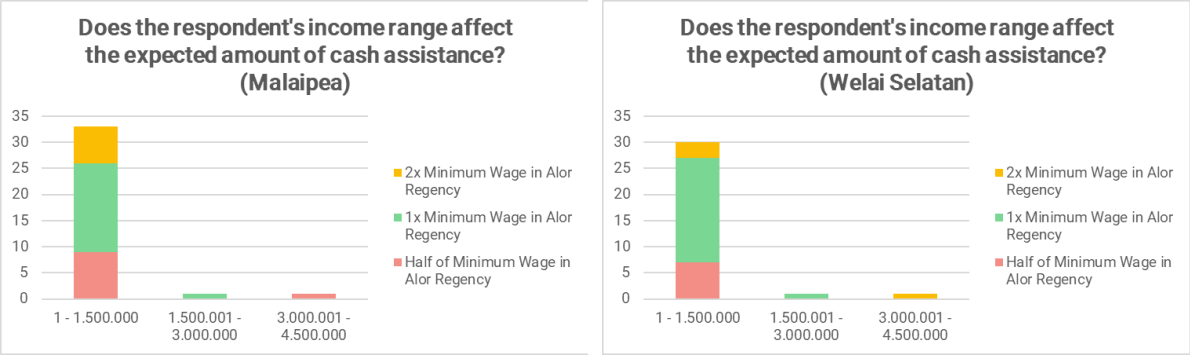


Figure 78 Number of respondents based on income range vs expected amount of cash assistance

5.6 Availability, access, and quality of social protection

Regarding the national social protection program, there is the 'Program Keluarga Harapan (PKH)', a conditional social assistance program for Poor Families (KM) designated as PKH beneficiary families[54]. PKH beneficiary criteria can be divided into 3 components, namely the health component, the education component, and the social welfare component. The health component consists of pregnant/postpartum/breastfeeding women and children at an early age (0-6 years). The health component consists of school-age children, namely children aged 6 to 21 years who have not completed compulsory education up to senior high school level. Meanwhile, the social welfare component consists of the elderly and persons with severe disabilities.

DPMD representatives stated that they would assist the community in the village to access the PKH program from the social services[55]. The PKH program is in the form of cash worth IDR 600,000 per family. Based on the publication of the People's Welfare Statistics for 2022 by the NTT Provincial Statistical Agency, 33.20% percentage of households in Alor Regency as beneficiaries of the PKH program in 2022. Due to the absence of beneficiaries' information at the village level, it is inconclusive to determine whether the database of beneficiaries can be used for potential future FBEA programming.

As mentioned in a key-informant interview with a DPMD representative, the social protection programs have been in place. For example, when a disaster occurs, there is direct cash assistance

54 See https://kemensos.go.id/program-keluarga-harapan-pkh

55 See transcript of KII with DPMD

from the government of IDR 300,000/month for one year. The cash assistance uses the state budget transferred to the village as part of the village budget (Dana Desa). DPMD is the authority for the village cash assistance, which will direct handover to the beneficiaries (cash/tunai) upon a consensus at the village level. One of the requirements to receive this cash assistance is that the beneficiaries are not also part of the PKH scheme. Cash assistance will be given to the beneficiaries following disasters, and currently focusing on the affected households due to the 2021 Seroja.

The representative of DPMD also stated that they are trying to advocate for village chiefs to budget part of village funds for disaster emergency response. This advocacy also extends to drafting Village Regulations related to Disaster Management and allocating educational assistance to affected families whose children are still at school. However, the village community still considers disaster issues not to be a priority; thus, the implementation still needs to be improved.

Figure 79 shows that more than 50 percent of respondents in both villages had received cash assistance from both WVI and non-WVI. Most respondents were satisfied with the provisions of cash assistance. And a small number of respondents would prefer more. This figure indicates that both villages can apply social protection programs such as cash assistance or shopping vouchers for future emergencies. As for social protection programs, respondents in both villages hoped for cash support, building materials, medicines, groceries, relocation, disaster risk reduction training, and the reconstruction of houses affected by the disaster, either from the government or NGOs.

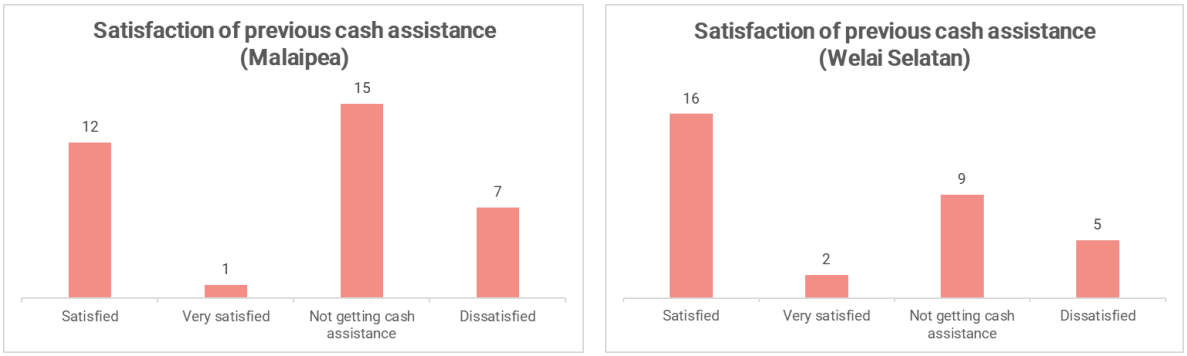


Figure 79 Number of respondents based on satisfaction of cash assistance program

In general, national social protection mechanisms and programs are available to tackle poverty issues and emergency response, but not intended to support early action before a disaster arises. However, there are at least three concerns that can be considered to maximize the

national budget for social protection. First, the absence of the budget allocated and used for early action and how this will synergize with the existing national social protection program, such as PKH and cash assistance for emergencies. The synergy here can include the criteria/requirements for each program, how they can be applicable against the early action, as well as the nominal cash assistance that differs from one to another. Second, subsequently, it is also worthwhile for the government and non-government with similar interventions of cash assistance to work collaboratively to avoid potential gaps or duplication. For instance, roughly the nominal cash assistance from the government and nongovernment, and mode of transfer are different. Third, WVI and PMI rely on the heads of villages and surveys to determine the beneficiaries, while the government's program uses their household databases or unified beneficiary registry. Nevertheless, communities are familiar and convenient with cash assistance, which can be presumed/indicated that there is room for CVP intervention in the communities.

5.7 Case conclusion: feasibility & viability of FBEA in Malaipea and Welai Selatan Villages, Alor

According to the findings outlined in subchapters 5.1 to 5.6, this study concludes that there remains room for improvement to increase understanding of early warning and early actions from OPDs down to the community's level. For easier reference, the following is the illustration of the flow of early warning from top to down, including the general early actions from respective groups gathered through the KIIs. From this illustration, this study also identifies some potential interventions that can be taken by WVI to implement CVP for early actions.

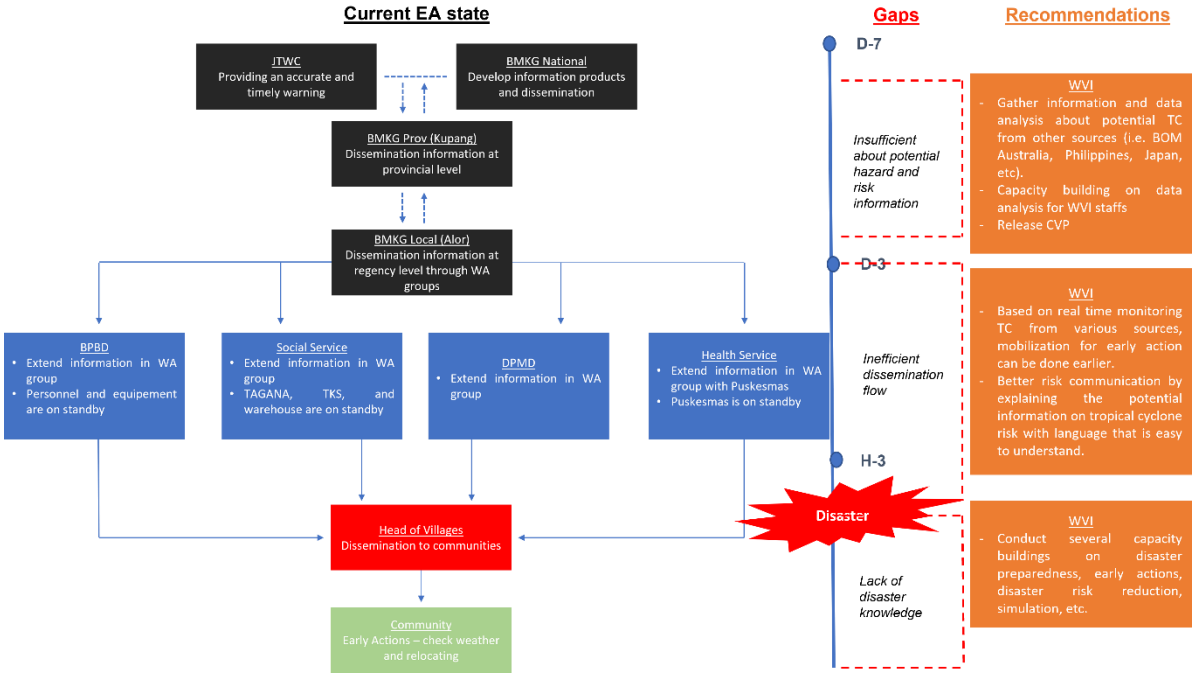


Figure 80 Case summary and gap of FBEA for Cyclone in Alor Regency

Moreover, based on several indicators as mentioned in the previous sub-chapters, this study concludes that Alor Regency has low viability specifically for cyclone hazards due to very minimal early warning systems in place with limited understanding of early actions from OPDs and the communities, compared to the case study of Jakarta. Therefore, supposed to pursue FBEA intervention, this study recommends crafting the program carefully by framing it from the point of increasing awareness/understanding of early warning and early actions within the context of disaster risk reduction among communities and OPD, including non-governmental organizations. The lack of a disaster management program in Alor Regency is evident to conclude that there is room for WVI to champion it through the FBEA project. Regarding

vulnerable groups, it is worthwhile to recognize that lines and ways of communication among the groups are different based on their characteristics of limitations. Therefore, it is recommended to examine the groups based on their vulnerability characteristics and include them in the SOP on early warning dissemination and early action. To conclude, the following are the recommendations based on the criteria for the low viability category for FBEA programming derived from the adaptation of Anticipatory Action Guidelines (2023).

Table 25 Viability criteria from AA (Alor)

Viability criteria (Adapted from AA, 2023)	**Compliance in Alor / WVI operation national level** **(Scale 1-5 with 1 is the least compliant and 5 is the most compliant)**	**Qualitative and Quantitative Evidence**
Low viability for a specific hazard		
There are financial management concerns such that it would be impossible for the WVI office to access FbA using the core WVI funds *(please suggest term)*.	1	Currently, there is no dedicated funding system/pot for FBEA or CVP for early action, except for this ongoing FBEA project. This FBEA project is the first attempt of WVI and will determine the decision of WVI's programme in Alor Regency. The core WVI funds is still limited to support CVP or in-kind assistance during the emergency response.
There are financial management concerns such that it would be impossible for the local government (OPDs) to access FbA using the state-fund (e.g., DSP, BTT, Village Fund).	3	OPDs activate their state-fund when the disaster has happened. For instance, Dinas Sosial specifically mentions that they cannot disburse the funds until there is a disaster even though BMKG has issued the early warning. This statement indicates lack of awareness of OPDs about the provisions of the state-fund to be disbursed to the communities in critical times before the disaster strikes.
There are no forecasts for the prioritized hazard, or no forecasts that have sufficient accuracy at lead times that would allow for meaningful action (e.g., only forecasts with 1-3 hours lead time have sufficient skill).	3	The forecast is available but with insufficient accuracy and unorganized dissemination of information with limited understanding of early actions

Viability criteria (Adapted from AA, 2023)	Compliance in Alor / WVI operation national level (Scale 1-5 with 1 is the least compliant and 5 is the most compliant)	Qualitative and Quantitative Evidence
The WVI local office does not have the capacity to implement meaningful actions in the lead time of available forecasts	3	Minimum resources within WVI local office (only 2 staffs for this project) that must implement the overall project
The BPBD / other local government OPDs do not have the capacity to implement meaningful actions in the lead time of available forecasts	5	Overall responses among the OPDs are limited to 'waspada' or alert without a concrete action of evacuation the communities who reside in the red zone for instance. In addition, no evacuation centers observed during the field data collection.
The WVI local office is uninterested in pursuing the development of an FbF system.	2	Lack of resources while there are lot of work needs to be done in Alor Regency that has a minimum awareness of early action and early warnings
The BPBD / relevant local government OPDs is uninterested in pursuing the development of an FbF system.	5	OPD is very much welcome to receive support in enhancing early warning and early action.
There is no financial service provider available to channel the FbF/FBEA through CVP	4	There are some local financial services that can be used for CVP as practiced by WVI during its CVP for COVID and Seroja responses. The local financial services are also available down at the village levels.
In case of imminent hazard / disasters, market is not functioning, including not ready or have limited stocks to absorb the influx of cash / voucher	2	Communities in the two villages must go down to downtown Kalabahi City (approximately 16 km and requires 1,5 hours by car) to shop because a limited market is available in both villages. In fact, the market in Kalabahi City was also overwhelmed since other organizations also stocked food and non-food items for relief support as in the instance of Seroja response.

6. Recommendations for enhancing the viability of FBEA by Wahana Visi Indonesia

The Feasibility Study of Early Actions in East Jakarta and Alor Regency (this study) is motivated by the vision and aspiration of *Wahana Visi Indonesia* to strengthen the possibility of intervention from a "response-to-disasters" into a "response-to-forecasts". In addition, WVI anticipated a potential marriage between the generic early actions through specific modalities of cash-voucher programming, with a particular focus on gender, protection, and social inclusion. Therefore, the study took place in two locations whereby WVI has had a presence in both locations, either through DRR or emergency response programming.

The study found that for East Jakarta, especially Kampung Melayu Village, the case seems to be somewhere between moderate to ideal levels of viability for FBEA creation. Meanwhile, the study concludes that a low viability of immediate FBEA implementation against tropical cyclone risk in Alor Regency, especially for Malaipea and Welai Selatan. Notwithstanding the conclusions, this means FBEA programming in Alor Regency would require greater efforts as prerequisites.

Table 26 Recommendations for advancing FBEA in East Jakarta

Action Type 1	**Imperative to the success of the project** a. Micro-level hydrometeorological and hydrological modeling to enhance existing risk assessment and strengthen probabilistic scenario for ensuring FBEA trigger and potential caseload of beneficiaries of EA in Kampung Melayu. b. Table-top exercise with all key actors, including BNPB, BPBD, BMKG, community leaders, and potential FSPs, to test out trigger and agreed in the no-regret parameters of the FBEA, including decision on the maximum financial coverage could be disbursed by WVI per individual or households in the event of future disaster forecast c. Community meeting to socialize in advance WVI's beneficiaries' criteria for FBEA in the near future and to solicit feedbacks from the community as well as to encourage non-beneficiaries and local government to prepare for complementary actions
Action Type 2	**Strongly suggested in order to have a successful FBEA programming** d. Explore and tap into the current advancement of InaSAFE, BMKG's Signature, Katulampa Dam River monitoring, and BPBD Jakarta's dashboard for strengthening the SOPs at community level for early actions.

	e. Annual updates of flood contingency plan that covers multiple scenario and return periods f. Annual updates and co-design of FBEA through CVP with potential FSP, including Duit Hape, Pos, as well as other potential providers
Action Type 3	**Desired actions that are important to the design of a robust FBEA program** - however, even without these actions the FBEA program/project can be implemented d. Develop a feedback loop and grievance mechanism from the communities upon participating / benefitting from the WVI's or any other actors' FBEA program e. Encourage BPBD and other humanitarian actors to prepare a similar, yet complementary, FBEA in sectors other than covered by WVI's CVP or in other villages, to ensure coverage in the event of disasters f. Annual drills and exercises, leveraging on the National Disaster Preparedness Day or other community commemorative days
Action Type 4	**Future considerations that are not crucial at present, but may support to inform future decisions** d. Keeping abreast to the penetration of flood insurance or other risk transfer products available for people or businesses in Kampung Melayu e. Updating flood risk assessment scenario upon completion of recent flood embankment by *Kemenpupera* f. Updating flood risk assessment scenario in Kampung Melayu should there be any new construction of major infrastructure projects.

Section 5 showed that in both villages, and Alor Regency in general, the general investment covering the broad spectrum of the disaster risk management cycle is still urgently needed before designing strategies and programs specifically for FBEA. Alor Regency even requires support to update its disaster risk assessment document (KRB), disaster management strategy (RPB), local emergency management plans (RPKB), and contingency plans against prioritized hazards (Renkon). In this sense, FBEA programming can also be used as an attempt to "rebrand" interventions to Alor while at the same time supporting the local government to meet its minimal essentials in disaster management.

Table 27 Recommendations for advancing FBEA in Alor Regency

Action Type 1	**Imperative to the success of the project** a. Updating micro and meso-level risk assessment, especially for target hazard of FBEA programming, i.e., tropical cyclone b. Increasing awareness of disaster risk and early warning at the community/village level through regular capacity building/socialization/simulation.

	c. Increasing awareness of FBEA including the advocacy of the utilization of state budget and coordination among the local government (OPD). d. Explore market readiness and adjust coverage, type, and quantity of CVP of FBEA program in Alor Regency. e. Creating market opportunities in Alor Regency to ensure the readiness of supply-demand. f. Creating local early warnings at the village level with the communities that can be inclusive of the marginalised groups, such as disabled people, elderly, and children. g. Developing a local early warning infrastructure through an automatic weather station installed in the village or a simple rain gauge operated by the community.
Action Type 2	**Strongly suggested in order to have a successful FBEA programming** e. Fostering the capabilities of BMKG's early warnings, particularly in terms of advance analysis and information of dissemination to OPDs and communities, from national down to local level. f. Fostering the capabilities of BPBD Alor Regency, particularly enhancing the role of EOC, to excel impact analysis and early actions, including to utilize tools external to the BPBD and BMKG g. Initiating a working group with PMI or local stakeholders to champion FBEA programme through knowledge exchange, resource sharing, etc. h. Conducting social and vulnerability analysis/mapping.
Action Type 3	**Desired actions that are important to the design of a robust FBEA program** - however, even without these actions the FBEA program/project can be implemented i. Creating potential hazard signs particularly risk map, hazard map, evacuation sites/routes, and vulnerability map, including socialization to the communities and head of villages. j. Creating a sister village system for evacuation or creating new supplies for markets to be used by potentially affected villages k. Creating market opportunities in Alor Regency to ensure the readiness of supply-demand. l. Revisit and enhance documents and SOPs to include lessons learned of the 2021 Seroja and FBEA principles, such as KRB Alor Regency m. Conducting regular simulation exercise for cyclone hazard involving OPDs, heads of villages, and communities to test the early warnings and early actions n. Developing a feedback loop and grievance mechanism from the communities upon participating / benefitting from the WVI's or any other actors' FBEA program o. Encouraging BPBD and other humanitarian actors to prepare a similar, yet complementary, FBEA in sectors other than covered by WVI's CVP or in other villages, to ensure coverage in the event of disasters

	p. Annual drills and exercises, leveraging on the National Disaster Preparedness Day or other community commemorative days
Action Type 4	**Future considerations that are not crucial at present, but may support to inform future decisions** c. Initiating an alliance of non-government organizations that run similar programme or related to disaster risk reduction programme to leverage the disaster awareness programme d. Increasing awareness of private sectors to boost markets and access to and from Alor

In addition to the prerequisites, this study also highlights the best practices of IFRC that can serve as reference points for WVI in preparing and implementing FBEA, which is to determine clear trigger/level of early warnings, target beneficiaries based on the capacities, and impact prioritization, which are then translated into a set of SOPs. In terms of SOP, there are at least two types of SOPs that WVI can refer to in pursuing FBEA: SOP on any mechanisms for distributing early warning and SOP for early actions. Furthermore, as an attempt to generalize the findings and recommendations from both locations relative to the context of Indonesia, the table below provides general recommendations for WVI and disaster management stakeholders in Indonesia for advancing the FBEA agenda.

Table 28 General recommendations for WVI and disaster management stakeholders in Indonesia for advancing FBEA

Action Type 1	**Imperative to the success of the project / any FBEA initiatives in the country** a. Integrate relevant data and information belonging to the BMKG, Ministry of PUPR, and relevant organizations monitoring / having access to rivers and other hydrometeorological hazards. b. Redesign a country-wide classification of hydrometeorological hazards and warning products to avoid multiple interpretation of “awas”, “waspada”, and “siaga” vis-à-vis other other hazards information. c. Micro-level hydrometeorological and hydrological modeling to enhance existing risk assessment and strengthen probabilistic scenario for ensuring FBEA trigger and potential caseload of beneficiaries of EA in selected cities / communities aspring for having FBEA program d. Table-top exercise with all key actors, including BNPB, BPBD, BMKG, community leaders, and potential FSPs, to test out trigger and agreed in the no-regret parameters of the FBEA, including decision on the maximum financial coverage could be disbursed by WVI or other agencies per individual or households in the event of future disaster forecast

	e. Community meeting to socialize in advance beneficiaries' criteria for FBEA in the near future and to solicit feedbacks from the community as well as to encourage non-beneficiaries and local government to prepare for complementary actions
Action Type 2	**Strongly suggested in order to have a successful FBEA programming** a. Conduct high-level dialogue for determining nation-wide grand course-of-actions on FBEA, especially between BNPB, BMKG, and Ministry of Social Affairs in connection to prioritizing locations requiring FBEA-like approach, advancement of impact-based early warnings in those locations, and deciding on FBEA connection to other social protections program b. Revisit current regulations and policies that could provide legal space for advancing impact based EWS and early actions c. Aside from East Jakarta and Alor Regency, WVI could explore pioneering FBEA in other locations whereby the risk is well understood and WVI has a strong presence d. Conduct a seminar and coaching clinic with Duit Hape and PT Pos to nurture the availability of financial service providers for FBEA.
Action Type 3	**Desired actions that are important to the design of a robust FBEA program** - however, even without these actions the FBEA program/project can be implemented a. Develop a feedback loop and grievance mechanism from the communities upon participating / benefitting from the WVI's or any other actors' FBEA program b. Encourage BNPB, Ministry of Social Affairs, BPBDs and other humanitarian actors to prepare a similar, yet complementary, FBEA in sectors other than covered by WVI's CVP or in other cities/regencies, to ensure coverage in the event of disasters c. Annual drills and exercises, leveraging on the National Disaster Preparedness Day or other community commemorative days
Action Type 4	**Future considerations that are not crucial at present, but may support to inform future decisions** a. Enhance the capability for weather information and warning "nowcasting" for known hydrometeorological hazards b. Regional and local humanitarian logistics mapping, both those belong to the government and non-government organizations c. Create a national coalition and community of practice for FBEA, including regular forum to foster cross-regional learning on FEBA – e.g., an Indonesian-based "Anticipation Hub" d. Stock take and motivate broad spectrum of financial service providers to play greater roles in supporting FBEA, including non-traditional humanitarian funders, e.g., affiliated to Mosque or Church communities

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