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The Effectiveness of Cash Transfer Program (CTP) in Supporting Disaster Anticipatory Action at the Community Level

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Abstract: Indonesia has a high vulnerability to hydrometeorological disasters, which threaten the economic resilience of communities in flood-prone areas. This study aims to evaluate the effectiveness of Cash Transfer Programming (CTP) as an anticipatory action instrument in mitigating the economic impacts of disasters using a mixed-method approach that integrates quantitative data from household surveys and post-distribution monitoring with qualitative data from focus group discussions in four affected villages in Lombok (Dara Kunci, Belanting, Obel-obel, and Taman Ayu). The findings show that the implementation of CTP through a trigger-based delivery system successfully reached 988 households, with the majority of beneficiaries (83% to 96%) allocating assistance toward essential food needs to maintain physical stability. Using the Gap Analysis formula (Gap = |U − A|), the study finds that the intervention demonstrates very high cost-effectiveness, as relatively small amounts of assistance serve as tactical capital to protect productive assets such as livestock, which have significantly higher economic value than the aid provided. Qualitative findings further confirm that the assistance is perceived as a strategic safety net that enables communities to undertake independent evacuation measures. In conclusion, CTP is effective as a catalyst for community self-reliance in breaking the cycle of post-disaster poverty, and strengthening the integration between social protection systems and need-based mitigation strategies is essential to optimize future anticipatory actions.

Keywords: Anticipatory Action, Cash Transfer, Disaster Mitigation, Economic Resilience, Gap Analysis

Introduction

Indonesia consistently ranks among the countries with the highest levels of natural disaster risk in the world. This condition is a logical consequence of its geographical location at the convergence of three major tectonic plates, namely the Indo Australian, Eurasian, and Pacific plates, as well as its position along the Pacific Ring of Fire (BNPB, 2023; Angglena and Pandey, 2025). This situation requires continuous preparedness, as disasters often occur suddenly and produce widespread impacts (Putri et al., 2022)

Beyond geological hazards, the complexity of disaster risk in Indonesia is further intensified by increasingly unpredictable global climate dynamics (Azizah et al., 2022). The latest report from the Intergovernmental Panel on Climate Change confirms that climate change has accelerated the hydrological cycle, resulting in an increase in both the frequency and intensity of hydrometeorological disasters such as flash floods, extreme droughts, landslides, and cyclonic storms (IPCC, 2023). These impacts are particularly evident in tropical regions, including Indonesia, where significant changes in rainfall patterns directly threaten food security and national economic stability across various sectors (Anjani et al., 2024).

This condition of vulnerability creates substantial systemic impacts on the socio economic life of communities, particularly among marginalized groups (Bigandata et al., 2023; Devita et al., 2022). Communities living below the poverty line are often the most affected

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due to limited access to productive resources, risk information, and adaptive capacity (UNDRR, 2022). As a result, disaster management in Indonesia is undergoing an important transformation, shifting from a reactive emergency response approach toward more proactive, preventive, and sustainable disaster risk reduction strategies that aim to reach all segments of society (Nurikhsan et al., 2025).

One important development in global disaster risk management is the emergence of the anticipatory action approach (Pakpahan, 2025). This approach emphasizes taking action before disasters occur through the use of scientific forecast data, reliable early warning systems, and data driven risk analysis (IFRC, 2020; FAO, 2024). In contrast to conventional preparedness, anticipatory action aims to provide immediate protection for both lives and assets before the hazard reaches affected areas (Kemenko PMK, 2023). This approach is considered more effective in reducing humanitarian impacts and economic losses compared to assistance delivered only during the emergency response phase after a disaster (Anticipation Hub, 2022).

Within the framework of anticipatory action, Cash Transfer Programming, or cash assistance, refers to social assistance provided to beneficiaries, sometimes with specific conditions (Larasati and Jannah, 2022). This approach has become an increasingly important instrument for governments and international organizations (FAO, 2021; Rahmat et al., 2024). Cash assistance offers greater flexibility than in kind support, as it allows beneficiaries to make decisions based on their own priority needs when facing potential risks (CALP Network, 2023; United Nations, 2020). Through pre disaster cash assistance, communities can carry out self evacuation, strengthen their housing structures, and secure productive assets before market access is disrupted, thereby maintaining dignity and independence during times of crisis.

Despite its strong potential, the implementation of cash assistance requires further examination, particularly in terms of inclusivity and operational accuracy in the field. The effectiveness of this approach depends on timely delivery, accessibility for vulnerable groups such as women and persons with disabilities, and strong integration with national social protection systems (UN Women, 2021). At present, there remains a gap in research related to the technical challenges of integrating cash assistance with forecast based trigger mechanisms at the local level. Therefore, this study aims to evaluate the effectiveness of cash assistance in strengthening community resilience and to provide policy recommendations for more adaptive and needs based disaster management.

Method

1. Research Design

This study employs a mixed methods approach with a case study design to evaluate the effectiveness of Cash Transfer Programming in supporting anticipatory action at the community level. This approach enables the integration of quantitative and qualitative data to achieve a comprehensive understanding of the research problem (Creswell and Plano Clark, 2018), while the case study design allows for an in depth exploration of program implementation within real world contexts (Yin, 2018). The study was conducted in four villages, namely Belanting, Obel Obel, and Darakunci in East Lombok Regency, as well as Taman Ayu in West Lombok Regency. These locations were selected purposively, as they had activated the disbursement of Cash Transfer Programming funds after disaster trigger indicators and threshold levels had been reached, making them relevant for analyzing the implementation of Cash Transfer Programming within a pre disaster framework based on risk forecasting.

2. Data Collection

Data collection was conducted during the 2024 to 2025 period using various complementary techniques. Data were obtained from participatory learning workshops involving implementing partners, communities, and stakeholders. The first day consisted of structured panel discussions to explore the effectiveness of anticipatory action, while the second day applied an interactive approach through focus group discussions, mini surveys, and digital tools to capture community experiences related to disaster impacts and potential avoidable losses (Morgan, 2019). In addition, household surveys, in depth interviews, and document studies were conducted as secondary data sources. All of these techniques were combined through triangulation to improve the validity and reliability of the research findings (Denzin, 2017).

3. Data Analysis

Data analysis was conducted by combining quantitative and qualitative techniques (Sofwatillah et al., 2024). Quantitative data were analyzed using descriptive statistics to identify patterns in the use of cash assistance, program coverage, and its contribution to community preparedness (Malika et al., 2024). Percentage calculations were used to determine the proportion of respondents in each category, as shown in the following equation:

$$P = \frac{f}{N} \times 100\% \quad (1)$$

Where P represents the percentage of respondents in a specific category, f refers to the number of respondents in that category or frequency, and N denotes the total number of respondents.

$$\dot{x} = \sum \frac{X}{n} \quad (2)$$

Where $\bar{x}$ represents the mean value, $\sum X$ refers to the sum of individual values such as expenditure or use of assistance, and n denotes the total number of observations or respondents.

$$\text{Gap} = |U - A| \quad (3)$$

Where Gap represents the difference between the use of assistance and anticipatory action needs, U refers to the percentage of cash assistance utilization by households, and A denotes the percentage of anticipatory actions undertaken or required.

Qualitative data from focus group discussions, panel discussions, and interviews were analyzed using thematic analysis (Nowell et al., 2017). The analysis followed several stages, including data familiarization, coding, theme development, and interpretation. This process aimed to identify key themes related to program effectiveness, economic impact, inclusivity, and implementation challenges.

4. Validity and Reliability

To ensure the validity and reliability of the findings, this study applied data triangulation by integrating multiple sources, including survey data, interviews, focus group discussions (Nurfajriani et al., 2024), and program monitoring data such as Onsite Distribution Monitoring (ODM) and Post Distribution Monitoring (PDM). Cross validation between datasets was conducted to ensure consistency. The use of standardized instruments with contextual adaptation further strengthened the methodological rigor

Result and Discussion

The implementation of the Cash Transfer Program within the Anticipatory Action framework is carried out through a strategic collaboration between KONSEPSI NTB and PT Pos Indonesia, in coordination with its branch offices in Selong, East Lombok and Unit Kota Mataram. The distribution of cash assistance is implemented using the PT Pos Indonesia corporate postal money order (Wesel Pos Korporat) mechanism, which is designed to ensure an efficient, transparent, and accountable delivery process for beneficiaries (Philaret, 2020). In collaboration with Oxfam in Indonesia, the program applies a two stage disbursement scheme across five villages in two regencies, where each phase is determined based on predefined early warning indicators and threshold triggers. The first phase provides cash assistance of IDR 400,000, followed by a second phase of IDR 200,000, ensuring that financial support is aligned with evolving flood risk conditions in the targeted areas.

1. Mechanism and Procedures Cash Transfer Program

The Cash Transfer Program begins with a household vulnerability assessment conducted at the pre implementation stage as the primary basis for mapping socio economic conditions in the intervention areas (Hermawati et al., 2024). This assessment aims to identify household vulnerability levels, adaptive capacity, and socio economic characteristics in relation to potential flood impacts. The process is carried out using a community based approach involving field enumerators, village governments, and program facilitators, applying assessment instruments that cover socio economic indicators, housing conditions, and livelihood access. The collected data is subsequently validated through a community verification mechanism to ensure data accuracy and to minimize inclusion and exclusion errors in the potential beneficiary database.

Although the vulnerability assessment provides the foundational dataset for targeting, the activation of the Cash Transfer Program is not directly determined by its results. Instead, activation is based on the achievement of predefined flood triggers and thresholds established under the Anticipatory Action framework at the village level. This mechanism ensures that assistance is only disbursed when early warning indicators confirm that flood risk has reached a critical threshold. Based on this activation criterion, four villages were triggered for Cash Transfer Program implementation, namely Belanting, Dara Kunci, Obel Obel, and Taman Ayu. Beneficiary data from these activated villages is then processed through the Corporate Postal Money Order system managed by PT Pos Indonesia to ensure a structured, transparent, and accountable distribution process.

Following activation, beneficiary data that has been previously verified through the assessment and community validation process is integrated into the PT Pos Indonesia system. The data includes full identity information, national identification numbers (KTP or KK), and residential addresses, which undergo final validation prior to the issuance of electronic money orders. Once the data is confirmed as valid, the system generates electronic vouchers, and disbursement notifications are delivered to beneficiaries through official channels or formal letters. All processes are digitally recorded, enabling real time monitoring, evaluation, and auditing. The distribution coverage and beneficiary allocation across the four activated villages are presented in **Table 1**.

Table 1. Beneficiary Distribution and Cash Transfer Locations in Activated Villages

Village	District	Number of Households	Distribution Location
Belanting	East Lombok	253	Village Office of Belanting
Dara Kunci	East Lombok	263	Village Office of Dara Kunci
Obel Obel	East Lombok	264	Village Office and SD Islam Dusun Melempo
Taman Ayu	West Lombok	208	Dusun Taman Hall and Posyandu Anggrek

Source: Technical Guidelines for CTP Distribution Mechanisms, KONSEPSI (2024)

The total number of beneficiary households across the four activated villages is 988 households. While the vulnerability assessment serves as an essential basis for initial targeting, program activation and assistance disbursement are strictly determined by the achievement of flood triggers and thresholds within the Anticipatory Action framework. This approach ensures that assistance is delivered in a timely and risk responsive manner, aligned with real time hazard conditions.

Distribution scheduling is conducted after activation based on early warning indicators agreed upon by stakeholders and formalized through Village Head Decrees in each location. Distribution sites are selected based on accessibility, safety, and inclusivity considerations to ensure that all beneficiaries, including vulnerable groups, can access assistance effectively. In several locations, multiple distribution points are established to reduce mobility constraints and improve service efficiency.

At the disbursement stage, beneficiaries are required to present valid identification documents, including the National Identity Card (KTP) and Family Card (KK), along with copies for verification by PT Pos Indonesia officers. Representation by another household member within the same family registry is permitted, provided that valid identification is presented. For beneficiaries unable to attend due to health conditions, assistance may be delivered directly to their residence with the accompaniment of local hamlet officials and program staff. In the absence of an eligible family representative, the hamlet head may act as an authorized proxy based on official village documentation. All transactions are electronically recorded, and official receipts are issued as part of the program's accountability framework.

To ensure operational integrity, PT Pos Indonesia applies standardized security protocols, including secure fund transportation and real time digital transaction monitoring. This mechanism strengthens transparency, improves operational efficiency, and minimizes the risk of distribution errors or potential misappropriation during implementation.

2. Utilization of Cash Transfers and Behavioral Shifts Toward Anticipatory Action

Based on the results of Onsite Distribution Monitoring (ODM), the sampling process was conducted to ensure that the data obtained could represent the overall conditions of beneficiaries in each intervention area. This approach is important for objectively and measurably assessing the quality of cash assistance distribution implementation. By using statistical parameters such as confidence level and margin of error, the monitoring results can serve as a scientifically accountable basis for evaluation. To determine the proportion of sample coverage, the following percentage formula is used:

$$\mathrm{P} = \frac{f}{N} \times 100\%$$

In East Lombok Regency, Onsite Distribution Monitoring was conducted in three villages, namely Belanting, Dara Kunci, and Obel Obel, with a total of 207 household respondents. The distribution of respondents shows variation across villages, where Belanting had the highest number of respondents with 81 households, followed by Dara Kunci with 67 households, and Obel Obel with 59 households. The percentage distribution of respondents was calculated based on a total number of respondents (N = 207), resulting in the following:

a). Belanting village

$$\mathrm{P} = \frac{81}{207} \times 100\% = 39\%$$

b). Darakunci village

$$\mathrm{P} = \frac{67}{207} \times 100\% = 32\%$$

c). Obel-Obel village

$$\mathrm{P} = \frac{59}{207} \times 100\% = 29\%$$

In contrast to East Lombok Regency, Onsite Distribution Monitoring in West Lombok Regency was focused on Taman Ayu Village, with a total of 65 household respondents out of a total beneficiary population of 208 households. Therefore, the analysis in this village places greater emphasis on sample representativeness relative to the population. The percentage distribution result for Taman Ayu Village is as follows:

$$\mathrm{P} = \frac{65}{208} \times 100\% = 31\%$$

The distribution of Onsite Distribution Monitoring respondents shows that the representativeness across the four villages is relatively

adequate. Belanting Village recorded the highest respondent proportion at 39%, followed by Dara Kunci at 32%, and Obel Obel at 29%. Meanwhile, Taman Ayu Village recorded a proportion of 31%, indicating a substantial level of sample representation compared to the total beneficiary population in the village.

Table 2. Respondents Distribution based on Villages

Category	N	Percentage
Desa Belanting	81	39%
Desa Dara Kunci	67	32%
Desa Obel-Obel	59	29%
Desa Taman Ayu	65	31%

Source: I CAN ACT Project Learning Report, 2024

In addition, the confidence level used in the sampling process across all locations was 95 percent, indicating that the monitoring data has a high level of reliability in representing the population conditions. However, there are differences in the margin of error between regions, where the three villages in East Lombok Regency have a margin of error of 6 percent, while Taman Ayu Village has a margin of error of 10 percent. This difference indicates that the data precision in East Lombok is higher than in Taman Ayu, as the potential deviation from the actual population condition is smaller. Nevertheless, both margin of error values remain within acceptable methodological limits, meaning that the monitoring results are still valid for analytical purposes. To further clarify the results of the ODM assessment, the following figure presents the data and findings obtained during the data collection process in the three villages of East Lombok Regency:

Table 3. Results of Onsite Distribution Monitoring in East Lombok Regency

Category	Belanting (N=81)	%	Dara Kunci (N=67)	%	Obel-Obel (N=59)	%	Total (N=207)	%
Purchase of Protective Equipment / Home Repairs	1	1%	1	1%	2	3%	4	2%
Purchase of Basic Needs	75	93%	41	61%	31	53%	147	71%
Purchase of Basic Needs & Protective Equipment	1	1%	1	1%	4	7%	6	3%
Purchase of Basic Needs & Health Needs	0	0%	2	3%	4	7%	6	3%
Purchase of Basic Needs & Evacuation Transport	0	0%	1	1%	4	5%	1	0.50%
Purchase of Basic Needs & Others	4	5%	11	16%	0	0%	22	11%
Purchase of Health Needs	0	0%	1	1%	1	2%	2	1%
Others	0	0%	5	7%	1	2%	6	3%
Grand Total	81	100%	67	100%	59	100%	207	100%

Source: I CAN ACT Project Learning Report, 2024

This data visualization shows the pattern of household expenditure allocation across three villages in East Lombok, namely Belanting, Dara Kunci, and Obel Obel, which is dominated by basic needs consumption at 71 percent. This reflects the economic priorities of the community, which remain focused on subsistence needs rather than risk mitigation investments. Although, in aggregate terms, investment in protection equipment and housing repairs is very low at only 2 percent, there are variations in spending patterns at the village level. Belanting Village shows the highest dependence on basic needs at 93 percent, while Obel Obel Village demonstrates a more diversified allocation toward health needs and asset protection at 7 percent each, indicating differences in economic vulnerability and mitigation awareness across areas. Meanwhile, the ODM results for Taman Ayu Village are as follows:

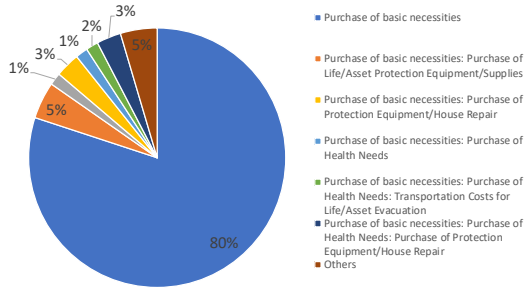

Figure 1. Results of Onsite Distribution in Taman Ayu Village
Source: I CAN ACT Project Learning Report, 2024

Based on the data visualization, it is evident that the majority of household expenditure, at 80%, is dominated by the fulfillment of basic needs. This indicates that household economic capacity is primarily allocated to daily consumption rather than specific investments in preventive disaster mitigation efforts. Other categories, such as the procurement of asset protection equipment, housing repairs, and evacuation costs, each account for less than 5%. These findings reflect challenges in community participation in independent disaster risk reduction, where the urgency of daily needs tends to outweigh financial allocation for long term mitigation efforts.

Based on Post Distribution Monitoring (PDM) results, out of 988 beneficiary households, approximately 70% reported utilizing the full amount of cash assistance received, indicating that the transfer value was appropriately calibrated and aligned with household needs. The expenditure distribution shows a strong prioritization of essential needs, particularly food consumption, which accounted for 92% of total utilization. Other notable categories include healthcare at 20%, asset protection at 8%, evacuation related transportation at 5%, and other emergency needs at 5%. These findings demonstrate that while the majority of households prioritized immediate consumption needs, a meaningful proportion also allocated resources toward anticipatory measures, reflecting the dual function of Cash Transfer Programming in supporting both short term welfare and disaster preparedness.

To identify trends in cash assistance utilization, the mean formula is used as follows:

$$\dot{x} = \sum \frac{X}{n}$$

Table 4. Post Distribution Monitoring Results in Three Villages of East Lombok Regency

Purpose	Yes (N)	%	Average spending	Min	Max
Staple food items	172	96%	291,436	100,000	400,000
Health Care Needs	34	19%	61,000	25,000	325,000
Protection Tools and house repair	9	5%	100,143	50,000	200,000
Transportation costs for asset and life rescue	7	4%	24,857	12,000	75,000
Equipment and procurement costs for life and asset protection	20	11%	85,714	25,000	150,000
Other	45	26%	74,653	10,000	400,000

Source: I CAN ACT Project Learning Report, 2024

After conducting the analysis of the table using the formula, the following results were obtained:

Table 5. Analysis Results of Expenditure Amounts

Purpose	$\bar{x}$ (Average)	n (Yes)	∑x (Total Pengeluaran)
Staple food items	291.436	172	50.126.992
Health Care Needs	61.000	34	2.074.000
Protection Tools	100.143	9	901.287
Transportation costs	24.857	7	173.999
Equipment and procurement	85.714	20	1.714.280
Other	74.653	45	3.359.385

Source: I CAN ACT Project Learning Report, 2024

Meanwhile, in Taman Ayu Village, the following data were obtained during the PDM process:

Table 6. Post Distribution Monitoring Results in Taman Ayu Village

Purpose	Yes (N)	%	Average spending	Min	Max
Staple food items	52	83%	289,907	88,000	400,000
Health Care Needs	13	21%	63,846	20,000	150,000
Protection Tools and house repair	5	8%	50,000	50,000	50,000
Transportation costs for asset and life rescue	3	5%	18,000	12,000	24,000
Equipment and procurement costs for life and asset protection	3	5%	65,000	10,000	120,000
Other	13	21%	131,000	20,000	300,000

Source: I CAN ACT Project Learning Report, 2025

From the data, the results of the applied formula are as follows:

Table 7. Analysis Results of Expenditure Amounts

Purpose	$\bar{x}$ (Average)	n (Yes)	∑x (Total Pengeluaran)
Staple food items	289.907	52	15.075.164
Health Care Needs	63.846	13	829.998
Protection Tools	50.000	5	250.000
Transportation costs	18.000	3	54.000
Equipment and	65.000	3	195.000
Other	131.000	13	1.703.000

Source: I CAN ACT Project Learning Report, 2025

3. Effectiveness of Cash Transfer Programming for Anticipatory Action

The implementation of Cash Transfer Programming in the Sambelia and Taman Ayu areas demonstrates the critical role of cash assistance in mitigating the impacts of flooding disasters. Overall, the effectiveness of this program is reflected in how communities rapidly allocate funds to the most urgent needs immediately after receiving early warnings. The spending patterns in both areas consistently prioritize household physical resilience, while also showing strategic efforts to secure productive assets that serve as the main source of community livelihoods.

Table 8. Household Utilization and Effective Anticipatory Action

Dara Kunci, Belanting, Obel-obel				Taman Ayu Village			
Cash Transfer Program Utilization	% Recipients	Effective Anticipatory Action	% Recipients	Cash Transfer Utilization	% Recipients	Effective Anticipatory Action	% Recipients
Staple food items	96%	Buying staple food	12%	Staple food items	83%	Buying staple food	18%
Health care needs	19%			Health care needs	21%		
Protection tools and house repair	5%	Saving valuable assets	8%	Protection tools and house repair	8%	Saving valuable assets	16%
Transportation costs (asset & rescue)	4%	Evacuating	70%	Transportation costs (asset & rescue)	5%	Evacuating	52%
Equipment & procurement (protection)	11%	Saving livestock	1%	Equipment & procurement (protection)	5%	Saving livestock	2%
Others	26%	Others	9%	Others	21%	Others	12%

Source: I CAN ACT Project Learning Report, 2024

During the FGD we explore the estimated item and values loss and damage due to flood that explain in the below table.

Table 9. Loss and Damage Item during Flood reported by Workshop Participant 2025

Loss/Damage Item	Minimum (IDR)	Maximum (IDR)	Average (IDR)
Agriculture			
- Rice Field Land	350,000	1,000,000,000	290,058,333
- Plantation Land	100,000	875,000,000	362,020,000
- Irrigation	30,000,000	30,000,000	30,000,000
Livestock			
- Cows	10,000,000	120,000,000	31,428,571
- Goats	1,500,000	18,000,000	8,375,000
- Chickens	25,000	50,000,000	10,577,000
- Ducks	100,000	1,800,000	683,333
- Horse	15,000,000	15,000,000	15,000,000
Housing & Assets			
- Household Items	50,000	30,000,000	5,797,222
- Valuable Goods	200,000	250,000,000	25,481,250
- Documents	3,500,000	100,000,000	42,125,000
- Housing Infrastructure	50,000	250,000,000	17,909,211
Overall Total/Average	25,000	1,000,000,000	63,697,708

Source: I CAN ACT Project Learning Report, 2025

Table 10. Comparison of fund utilization from both locations

Category of Utilization	Sambelia (Yes N)	Taman Ayu (Yes N)	Avg. Spending (Sambelia)	Avg. Spending (Taman Ayu)
Staple Food Items	172	52	Rp291.436	Rp289.907
Health Care Needs	34	13	Rp61.000	Rp63.846
Protection & Repair	9	5	Rp100.143	Rp50.000
Life Rescue & Transport	7	3	Rp24.857	Rp18.000
Equipment & Protect	20	3	Rp85.714	Rp65.000

Source: I CAN ACT Project Learning Report, 2025

The data above show that although the proportion of respondents varies, there is a consistent pattern in which staple food items remain the primary allocation of cash assistance. However, effectiveness should not only be assessed from participation percentages, but also from the extent to which relatively small allocations of funds are able to prevent significantly larger potential asset losses. To measure this gap, a Gap Analysis is used to compare the value of potential losses (U) with the cost of anticipatory action (A).

In evaluating this effectiveness, the following Gap Analysis formula is applied:

$$\mathbf{Gap = |U - A|}$$

Example Case (Cattle Livestock Sector):

$$\mathbf{|31.428.571 - 85.714| = 31.342.857}$$

The large gap value in this calculation confirms a very high level of cost effectiveness. With a cash assistance allocation (A) of only around IDR 85,000, communities are able to undertake anticipatory actions that effectively protect assets valued at more than IDR 31,000,000. In this context, Cash Transfer Programming does not function as a compensation mechanism for damages, but rather as an "emergency working capital" that enables households to take protective actions which, without assistance, would result in the loss of key livelihood assets.

The use of Cash Transfer Programming in Sambelia and Taman Ayu is considered highly effective in preventing the escalation of disaster impacts into deeper humanitarian crises. Through the fulfillment of essential food needs, the program ensures household nutritional stability during critical periods. Simultaneously, small investments in operational costs for livestock evacuation and household asset protection have provided significant economic protection. With an average total potential loss of IDR 63,697,708 per household, the presence of Cash Transfer Programming helps break the cycle of post disaster poverty that typically emerges due to the loss of productive assets.

Conclusion

The effectiveness of Cash Transfer Programming as an anticipatory action instrument has been proven to be highly significant in strengthening community resilience in Sambelia and Taman Ayu prior to peak flooding events. Through cash allocation patterns dominated by food consumption needs (83% to 96%), the program has successfully ensured household nutritional stability during critical periods, thereby minimizing adverse impacts on health and physical well-being among affected communities. Although allocations for physical asset protection, such as housing, remain limited compared to potential losses reaching tens of millions of rupiah, the presence of cash assistance provides flexibility for households to undertake asset protection measures, particularly for livestock, which is crucial for sustaining household economic livelihoods..

Gap Analysis using the formula Gap = |U − A| confirms that the effectiveness of Cash Transfer Programming in this context is not measured by its ability to fully cover total losses, but rather by its high cost effectiveness ratio in preventing the loss of key assets. With relatively small anticipatory investments (A) compared to potential loss values (U), the program is able to break the cycle of post disaster extreme poverty that is often triggered by the loss of livelihood assets. Therefore, Cash Transfer Programming functions effectively as a strategic safety net that not only serves as emergency assistance, but also acts as a catalyst for community self reliance in facing increasingly intense hydrometeorological hazards.

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Author Contributions

All authors contributed significantly to this study. Conceptualization and study design were carried out collaboratively by the authors. Methodology development was conducted jointly to ensure alignment with the research

objectives. Data collection was undertaken through fieldwork, surveys, and participatory approaches involving all authors and supporting teams. Data analysis was performed collaboratively using both quantitative and qualitative methods. The manuscript was drafted, reviewed, and finalized collectively by all authors, and all authors have read and approved the final version of the manuscript.

Conflicts of Interest

The authors declare no conflict of interest.

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