

## Strengthening the Social Resilience of Muslim Communities Affected by Flash Floods through the Digitization of Family Archives

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### Abstract

The loss of vital family documents during disasters poses significant risks to civil rights, administrative continuity, and community resilience. This study aims to strengthen the social resilience of disaster-affected Muslim communities by digitizing family archives. Conducted in Bumiaji Subdistrict, Batu City, Indonesia, following the 2021 flash flood, this research employed a Participatory Action Research (PAR) approach involving 40 participants. The study collected data through interviews, observations, and document analysis, and analyzed them using descriptive quantitative and thematic qualitative methods. The findings reveal a substantial improvement in participants' archival literacy and digital competencies. Knowledge of family archives increased from 69% to 94.7%, while understanding of digital archiving improved from 42.9% to 78.9%. Participants successfully digitized, organized, and stored essential documents independently, demonstrating enhanced preparedness for disaster risks. The study highlights that digital archiving serves as an effective strategy for preserving civil identity, protecting cultural memory, and ensuring administrative continuity. It further contributes to the discourse on archival studies and disaster management by positioning family-level digital archiving as a practical instrument for strengthening social resilience. This research proposes a replicable community-based model integrating digital literacy, archival preservation, and disaster preparedness, offering policymakers, archival institutions, and disaster-prone communities worldwide valuable insights.

**Keywords:** Social resilience; Digital archiving; Family archives; Participatory Action Research; Disaster risk reduction; Community empowerment.

### Abstrak

Kehilangan dokumen keluarga akibat bencana menimbulkan risiko signifikan terhadap perlindungan hak sipil, keberlanjutan administrasi, dan ketahanan sosial masyarakat. Penelitian ini bertujuan untuk memperkuat ketahanan sosial komunitas Muslim terdampak bencana melalui digitalisasi arsip keluarga. Studi ini dilaksanakan di Kecamatan Bumiaji, Kota Batu, Indonesia, pascabencana banjir bandang tahun 2021 dengan menggunakan pendekatan Participatory Action

*Research (PAR) yang melibatkan 40 partisipan. Data dikumpulkan melalui wawancara, observasi, dan analisis dokumen, serta dianalisis menggunakan metode deskriptif kuantitatif dan analisis tematik kualitatif. Hasil penelitian menunjukkan peningkatan signifikan dalam literasi kearsipan dan kompetensi digital peserta. Pemahaman tentang arsip keluarga meningkat dari 69% menjadi 94,7%, sementara pemahaman tentang digitalisasi arsip meningkat dari 42,9% menjadi 78,9%. Peserta mampu mendigitalisasi, mengorganisasi, dan menyimpan dokumen penting secara mandiri, yang menunjukkan peningkatan kesiapsiagaan terhadap risiko bencana. Penelitian ini menegaskan bahwa digitalisasi arsip keluarga merupakan strategi efektif untuk melestarikan identitas sipil, menjaga memori kolektif, dan menjamin keberlanjutan administrasi. Secara teoretis, penelitian ini berkontribusi pada pengembangan kajian kearsipan dan manajemen bencana dengan memposisikan digitalisasi arsip keluarga sebagai instrumen penguatan ketahanan sosial. Secara praktis, penelitian ini menawarkan model pemberdayaan berbasis komunitas yang dapat direplikasi di wilayah rawan bencana di tingkat nasional maupun global.*

**Kata Kunci:** Ketahanan sosial; Digitalisasi arsip; Arsip keluarga; Participatory Action Research; Pengurangan risiko bencana; Pemberdayaan masyarakat.

## **I. Introduction**

Indonesia is globally recognized as one of the most disaster-prone nations, as it lies along the Pacific Ring of Fire, a geologically active zone marked by numerous volcanoes and tectonic fault lines (Nugroho, 2018; National Geographic Society, 2022). This condition makes Indonesia highly vulnerable to natural disasters, including earthquakes, landslides, and flash floods. Historical records indicate that the country frequently experiences seismic and hydrometeorological hazards, placing it among nations with the highest disaster risk levels (Atmojo & Muhandis, 2019; Hermon, 2014). Consequently, disaster mitigation and preparedness have become critical priorities for sustainable development.

Beyond physical destruction, disasters generate multidimensional impacts, including social, economic, and administrative disruptions. Disaster-affected communities often suffer not only the loss of property and livelihoods but also the destruction of essential personal and family documents (Suliyati, 2017). These documents, such as identity cards, family registers, educational certificates, and land ownership records, play a crucial role in ensuring access to legal recognition, social services, and economic recovery (Sugiharto, 2012; Pratama, 2019). The loss of such documents may hinder post-disaster rehabilitation and delay access to governmental assistance.

Batu City, East Java, is among Indonesia's disaster-prone areas due to its location surrounded by mountains and hills. This geographical advantage fosters tourism development but simultaneously increases susceptibility to hydrometeorological hazards, including landslides and flash floods (Anita, 2017). The flash flood that occurred in November 2021 in Bumiaji Subdistrict caused significant damage to settlements, infrastructure, and vital family documents (Richa, 2021). This disaster highlighted the importance of safeguarding personal archives as part of disaster preparedness strategies.

Preliminary observations indicate that many affected residents were unable to secure their family archives during the disaster. Organizations predominantly stored documents in conventional formats and did not ensure adequate protection, thereby increasing the risk of damage or total loss. This condition reflects limited public awareness and capacity to manage and preserve family archives, particularly in

disaster-prone contexts. Such challenges underscore the need for innovative and sustainable archival preservation strategies.

Previous studies have emphasized the importance of archive management and preservation, including the role of digitization in protecting vital records (Nurtanzila & Sholikhah, 2021). Digital archiving enables documents to be stored securely, accessed efficiently, and preserved over long periods (VanSnick & Ntanos, 2018; Zahara & Salim, 2022). Moreover, digitization minimizes physical handling, thereby reducing the risk of deterioration and loss. In disaster-prone regions, digital archives serve as reliable backups, supporting administrative continuity and recovery efforts.

In addition to their administrative functions, family archives serve as repositories of identity, memory, and cultural heritage. They preserve personal histories and strengthen intergenerational continuity (Rosenberg, 2011; Reyes & Irvin, 2024). Advances in digital technology have further enhanced archival accessibility, enabling records to be shared and preserved across geographical boundaries (Jaillant et al., 2022; Blanke, 2024). Furthermore, the rapid growth of digital information has led to the emergence of personal digital legacies, which represent valuable cultural and historical resources for future generations (Gudmundsdottir, 2023; Nagy & Kiszl, 2021).

Despite increasing awareness of archival preservation, many communities still lack the knowledge and skills required to manage family archives effectively, particularly in digital formats (Susanti et al., 2020). This gap becomes even more critical in disaster situations, where the lack of properly managed archives can hinder recovery efforts and limit access to essential services. Therefore, strengthening community capacity to manage family archives through digitization becomes an urgent necessity.

This study focuses on digitizing family archives to enhance the social resilience of disaster-affected communities. The novelty of this research lies in its emphasis on community-based digital archiving practices as a practical approach to disaster preparedness and recovery. By integrating archival science, disaster management, and community empowerment, this study offers an interdisciplinary perspective on resilience building.

This study contributes to the existing literature in several ways. First, it extends the discourse on disaster resilience by highlighting the role of family-level digital archiving as a preventive strategy for safeguarding civil documents in disaster-prone communities. Second, it provides empirical evidence on how a Participatory Action Research (PAR) approach can effectively enhance community knowledge and skills in digital archive management. Third, it proposes a community-based intervention model that integrates digital literacy and disaster preparedness, which can be adapted and replicated in similar vulnerable contexts. Finally, this study bridges the gap between archival studies and disaster management by positioning digital archiving as an integral component of social resilience.

Accordingly, this study aims to analyze how digitizing family archives can strengthen the social resilience of Muslim communities affected by flash floods in Bumiaji Subdistrict, Batu City, Indonesia.

## **II. Method**

## 1. Research Design

This study employed a Participatory Action Research (PAR) approach, emphasizing collaborative engagement between researchers and participants to address real-world problems and generate practical solutions. PAR is widely recognized as an effective approach for community empowerment and social change, particularly in contexts involving vulnerability and disaster recovery (Kindon et al., 2007).

The research followed an iterative cycle consisting of planning, action, observation, and reflection. This cyclical process enables continuous refinement of interventions based on participants' experiences and feedback, ensuring contextually grounded and sustainable outcomes (Kemmis & McTaggart, 2005).

## 2. Research Setting and Participants

This study took place in Bumiaji Subdistrict, Batu City, East Java, Indonesia, selected for its vulnerability to hydrometeorological hazards and the profound impact of the November 2021 flash flood, including the loss of family archive documents. A total of 40 participants were involved in this study, consisting of residents, students, and household representatives responsible for managing family archives. Participants were selected using a purposive sampling technique, which allows researchers to select information-rich cases relevant to the research objectives (Creswell, 2018).

**Table 1. Participant Selection Criteria**

| No | Criteria                            | Description                                                                             |
|----|-------------------------------------|-----------------------------------------------------------------------------------------|
| 1  | Residence in disaster-affected area | Individuals living in areas directly affected by the flash flood in Bumiaji Subdistrict |
| 2  | Responsibility for family documents | Participants who manage or store important family archives                              |
| 3  | Willingness to participate          | Participants committed to actively engaging in all stages of the research               |

This selection ensured that participants were directly relevant to the research objectives and actively involved in the intervention process.

## 3. Research Procedure

The researchers implemented the research procedure through four main stages based on the PAR cycle. They designed each stage to facilitate active participation and progressive capacity building among participants.

**Table 2. Research Procedure (PAR Stages)**

| Phase       | Activities                                  | Description                                                                     | Output                                          |
|-------------|---------------------------------------------|---------------------------------------------------------------------------------|-------------------------------------------------|
| Planning    | Needs assessment & stakeholder coordination | SWOT analysis to identify problems and collaboration with local stakeholders    | Identification of needs and intervention design |
| Action      | Training and mentoring                      | Participants trained in identifying, digitizing, and organizing family archives | Increased knowledge and practical skills        |
| Observation | Monitoring and documentation                | Observation of engagement, learning progress, and challenges                    | Recorded behavioral and skill changes           |

|            |                        |     |                                            |                                                       |
|------------|------------------------|-----|--------------------------------------------|-------------------------------------------------------|
| Reflection | Evaluation<br>feedback | and | Group discussions and feedback<br>sessions | Improved<br>understanding<br>and<br>refined practices |
|------------|------------------------|-----|--------------------------------------------|-------------------------------------------------------|

This structured cycle reflects the core principles of PAR, in which participants are actively involved in knowledge production and problem-solving (Kindon et al., 2007).

#### 4. Data Collection

The study utilizes multiple data collection techniques to ensure comprehensive and reliable findings. The integration of diverse data sources facilitates triangulation and enhances the validity of the research (Denzin, 2012).

**Table 3. Data Collection Techniques**

| Method                           | Instrument                      | Purpose                                        | Data Type                  |
|----------------------------------|---------------------------------|------------------------------------------------|----------------------------|
| Structured interviews (pre-post) | Interview guide                 | Measure changes in knowledge and understanding | Quantitative & qualitative |
| Participant observation          | Observation sheet & field notes | Capture engagement and skill development       | Qualitative                |
| Document analysis                | Digital archive outputs         | Evaluate practical implementation ability      | Qualitative                |

These techniques enabled the study to capture both cognitive changes (knowledge improvement) and behavioral outcomes (practical skills in digital archiving).

#### 5. Data Analysis

Quantitative data obtained from the pre- and post-intervention assessments were analyzed using descriptive statistics, particularly percentage comparisons, to measure changes in participants' knowledge and digital archiving skills (Field, 2018). This approach enabled a systematic evaluation of the effectiveness of the intervention in enhancing archival literacy and technological competencies.

Qualitative data derived from interviews and participant observations were analyzed using thematic analysis, which involves coding, categorization, and interpretation to identify recurring patterns and themes (Braun & Clarke, 2006). The analysis followed a systematic process of data familiarization, coding, theme development, and interpretation to explore participants' experiences, perceptions, and behavioral changes.

To enhance the rigor and credibility of the findings, methodological triangulation was employed by integrating quantitative and qualitative data. This mixed-approach analysis provided a comprehensive understanding of the intervention's impact on strengthening digital competencies and social resilience among disaster-affected communities.

#### 6. Trustworthiness

To ensure the rigor and trustworthiness of the study, several strategies were employed, including data triangulation, member checking, and prolonged engagement. Data triangulation was achieved by integrating information from



interviews, participant observations, and document analysis, thereby enhancing the credibility and comprehensiveness of the findings. Member checking was conducted by sharing the research results with participants to verify the accuracy and authenticity of the interpretations. This process ensured that the findings accurately reflected participants' experiences and perspectives.

Furthermore, prolonged engagement enabled the researchers to build trust with participants and gain a deeper understanding of the research context. This sustained interaction minimized potential biases and enhanced the authenticity of the data. Collectively, these strategies strengthened the credibility, dependability, and confirmability of the qualitative findings, ensuring methodological rigor and consistency throughout the research process (Lincoln et al., 1985).

## 7. Ethical Considerations

Prior to data collection, participants were informed of the study's purpose and provided informed consent. The study ensured confidentiality and anonymity through the secure handling of personal data and digital archives, which were used exclusively for research purposes in accordance with established ethical research standards (Creswell & Poth, 2018).

## III. RESULTS AND DISCUSSION

### 1. Result

#### a. Baseline Condition of Participants

A baseline assessment evaluates participants' initial knowledge and capacity concerning family archives and digital archiving practices. The findings revealed that participants possessed moderate awareness of the importance of family archives but demonstrated limited competence in managing and preserving them, particularly in digital formats.

A total of 69% of participants identified essential family documents, including identity cards, family cards, birth certificates, and land ownership certificates. However, 26.2% of participants exhibited limited understanding, and 4.8% had minimal awareness. Participants' capacity in digital archiving was considerably lower. Only 42.9% of participants reported familiarity with digital storage practices, while 52.4% lacked understanding and 4.7% demonstrated partial knowledge.

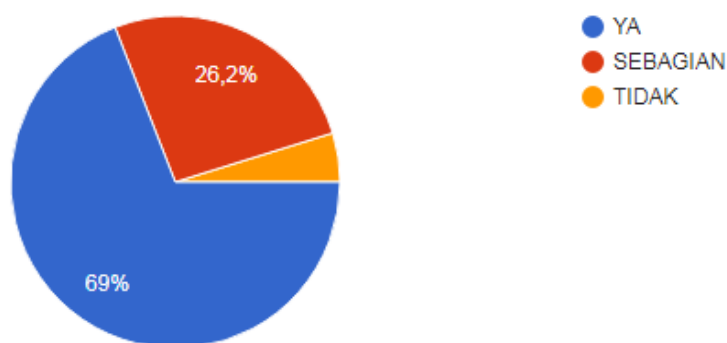


Figure 1 Participants Knowledge of family archives  
(KTP, birth certificate, family card, land and building ownership certificate)

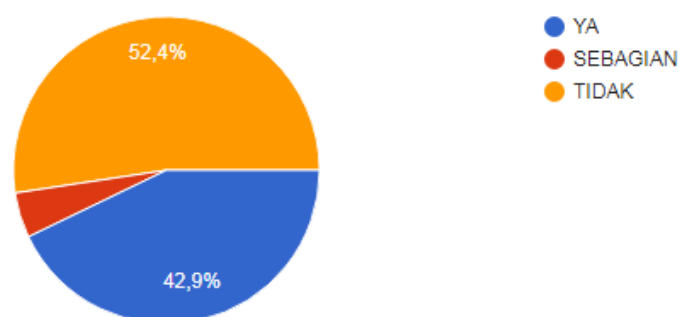


Figure 2 Participants' knowledge about storing family archives (KTP, birth certificates, family cards, land and building ownership certificates) digitally

Field observations indicated that most participants relied on conventional storage methods. Important family documents were typically stored in envelopes or folders without adequate protection, making them vulnerable to damage and loss, particularly during disasters. Interview and observation data in Table 4 provide further corroboration for these findings.

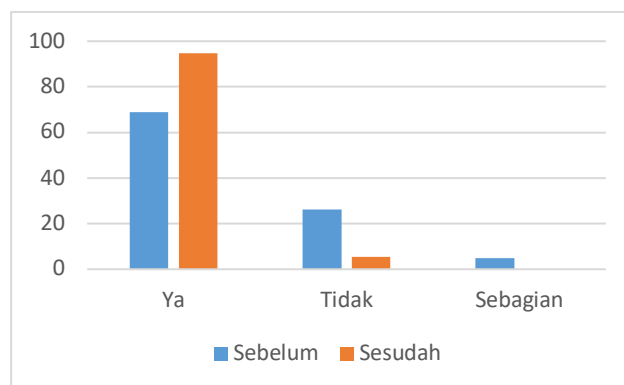
Table 4. Baseline Condition of Participants

| Aspect                       | Verbatim (Participants)                                                                         | Observation Findings                                       |
|------------------------------|-------------------------------------------------------------------------------------------------|------------------------------------------------------------|
| Awareness of family archives | "We know these documents are important, but they are usually stored without proper care." (P12) | Documents stored in folders without protective covers      |
| Archive storage practices    | "As long as they are not lost, we keep them in a cupboard." (P7)                                | Documents arranged unsystematically in drawers or cabinets |
| Digital archiving knowledge  | "I have never stored documents in digital form." (P3)                                           | No digital copies of family documents were found           |
| Disaster preparedness        | "We are not prepared if another disaster occurs." (P21)                                         | No backup or emergency document storage systems observed   |

The findings indicate a significant gap in participants' awareness of family archives and their ability to manage them effectively. Although participants recognized the importance of these documents, their storage practices remained conventional and vulnerable to disaster risks. Furthermore, the absence of digital archiving practices reflects limited technological literacy and insufficient preparedness for emergencies.

## b. Changes in Knowledge after Intervention

Following the implementation of the Participatory Action Research (PAR)-based intervention, participants demonstrated a significant improvement in their understanding of family archives. The proportion of participants with adequate knowledge increased from 69% prior to the intervention to 94.7% afterward. This improvement indicates the effectiveness of training and mentoring programs in enhancing participants' awareness and comprehension of family archive management



**Figure 3. Improvement in Participants' Understanding of Family Archives Before and After the Intervention**

Participants demonstrated enhanced knowledge by accurately identifying, classifying, and explaining the functions of essential family documents. They also developed greater awareness of the importance of safeguarding archives to protect civil rights and facilitate post-disaster recovery. Interview and observation data presented in Table 5 provide qualitative support that strengthens the interpretation of the quantitative findings.

**Table 5. Knowledge Improvement Based on Verbatim Interviews and Observations**

| Aspect                            | Verbatim (Participants)                                                                                                            | Observation Findings                                                                    |
|-----------------------------------|------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| Increased awareness               | <i>"After the training, I realized that family archives are very important and must be properly preserved."</i> (P11)              | Participants demonstrated a clearer understanding of the importance of family archives. |
| Conceptual understanding          | <i>"Now I understand the different types of family archives and their functions."</i> (P6)                                         | Participants correctly identified various types of family documents.                    |
| Ability to classify archives      | <i>"I just learned that diplomas, birth certificates, and land ownership certificates are categorized as vital records."</i> (P19) | Participants were able to categorize documents accurately during activities.            |
| Confidence in explaining archives | <i>"Now I can explain to my family the importance of preserving family archives."</i> (P24)                                        | Participants actively engaged and responded confidently during discussions.             |

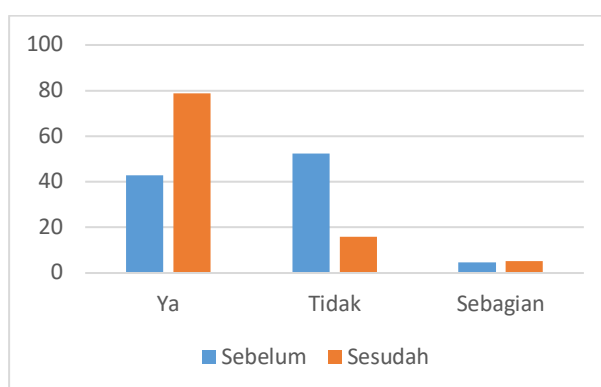
The qualitative findings confirm that the intervention significantly enhances participants' conceptual understanding. Observations during training sessions revealed increased engagement, active participation, and improved confidence among participants. These results demonstrate that the PAR approach effectively facilitated knowledge transfer through collaborative and experiential learning.

Overall, the findings indicate that the intervention successfully strengthened participants' understanding of family archives, thereby establishing a solid foundation for improving digital archiving skills and enhancing community resilience in disaster-prone areas.

### c. Improvement in Digital Archiving Skills



Following the intervention, participants demonstrated a substantial improvement in their digital archiving skills. Prior to the training, only 42.9% of participants understood how to store family documents digitally. After implementing the Participatory Action Research (PAR)-based program, this proportion increased significantly to 78.9%. This improvement indicates the effectiveness of the training and mentoring activities in enhancing participants' digital literacy and technical competencies.



**Figure 4. Improvement in Participants' Digital Archiving Skills Before and After the Intervention**

The intervention equipped participants with practical skills in digitizing and managing family documents. Participants learned to scan documents using mobile devices, organize files into structured folders, and store them securely in digital formats. These skills are essential for protecting vital records, particularly in disaster-prone areas. Qualitative evidence from interviews and observations in Table 6 complements the quantitative findings.

**Table 6. Improvement in Digital Archiving Skills Based on Verbatim Interviews and Observations**

| Aspect                        | Verbatim (Participants)                                                                             | Observation Findings                                                            |
|-------------------------------|-----------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------|
| Ability to digitize documents | <i>"It turns out that scanning documents using a mobile phone is very easy and practical."</i> (P5) | Participants successfully scanned documents using smartphones.                  |
| Digital file organization     | <i>"Now I have a special folder to store my family documents."</i> (P18)                            | Files were systematically organized into digital folders.                       |
| Independent application       | <i>"I can now store documents independently without any assistance."</i> (P27)                      | Participants completed digitization tasks independently.                        |
| Perceived usefulness          | <i>"Digital documents are safer and easier to retrieve whenever needed."</i> (P9)                   | Participants retrieved digital files efficiently.                               |
| Technological confidence      | <i>"I have become more confident in using technology to store archives."</i> (P14)                  | Increased confidence and engagement were observed during the training sessions. |

The findings demonstrate that the intervention enhanced participants' conceptual understanding and their practical competencies in digital archiving.

Observations confirmed that participants could perform digitization procedures independently, indicating a successful transfer of technological skills.

Furthermore, participants reported that digital archiving offered a safer, more accessible way to preserve important documents. These findings demonstrate a positive shift toward adopting technology as a preventive measure for disaster preparedness.

Overall, the results highlight the effectiveness of the PAR-based approach in strengthening digital literacy and empowering communities with essential skills for managing family archives in disaster-prone environments.

#### **d. Development of Practical Competence and Participant Response**

Beyond improvements in knowledge and technical skills, participants demonstrated significant progress in applying digital archiving practices independently. The intervention enabled participants to digitize, organize, and securely store essential family documents. These competencies reflect the practical outcomes of the Participatory Action Research (PAR) approach implemented in this study.

Participants successfully created simple digital archive systems using mobile devices. Documents such as identity cards, family cards, birth certificates, and educational records were scanned and stored systematically in digital folders. This achievement indicates that participants were able to translate theoretical knowledge into practical applications relevant to their daily lives. Qualitative evidence derived from interviews and observations in Table 7 provides additional support for the development of practical competence.

**Table 7. Development of Practical Competence and Participant Response**

| <b>Aspect</b>                | <b>Verbatim (Participants)</b>                                                               | <b>Observation Findings</b>                                                          |
|------------------------------|----------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| Practical implementation     | <i>"All of my family's important documents are now stored in digital form." (P10)</i>        | Participants successfully digitized and securely stored family documents.            |
| Systematic organization      | <i>"I created a dedicated folder so that the documents are easy to find." (P18)</i>          | Digital files were systematically organized into categorized folders.                |
| Perceived benefits           | <i>"Digital archives are safer and can be accessed anytime." (P6)</i>                        | Participants retrieved digital files efficiently.                                    |
| Disaster preparedness        | <i>"If another disaster occurs, I am no longer worried about losing my documents." (P14)</i> | Participants demonstrated increased preparedness and awareness of disaster risks.    |
| Training effectiveness       | <i>"This training was very beneficial and easy to understand." (P22)</i>                     | High levels of enthusiasm and engagement were observed during the training sessions. |
| Confidence in technology use | <i>"Now I feel more confident using technology." (P27)</i>                                   | Participants independently completed digitization tasks.                             |

The findings indicate that the intervention not only enhanced participants' technical competencies but also increased their awareness and preparedness for potential disasters. Participants responded positively to the training, highlighting its relevance and practicality for safeguarding essential family documents. Observations during the program further revealed high levels of engagement, active participation, and collaborative learning. Participants demonstrated confidence in using digital tools

and showed a willingness to adopt digital archiving practices in their daily lives. These outcomes underscore the effectiveness of community-based empowerment initiatives in fostering sustainable behavioral change.

Overall, the results confirm that digitizing family archives significantly strengthens community resilience. By ensuring secure, accessible documentation, the intervention supports individuals and families in protecting their civil rights and enhancing their preparedness in disaster-prone environments.

## **2. Discussion**

### **a. Enhancing Archival Literacy through Participatory Action Research**

The findings reveal a significant improvement in participants' understanding of family archives following the intervention, confirming the effectiveness of the Participatory Action Research (PAR) approach. PAR emphasizes collaborative engagement between researchers and communities in identifying problems, implementing solutions, and reflecting on outcomes. This participatory process fosters experiential learning and empowers communities to address real-life challenges, particularly in disaster-prone contexts (Kindon et al., 2007; MacDonald, 2012). The participants' archival literacy demonstrates that participatory methods are effective tools for promoting sustainable knowledge transfer and community empowerment.

Prior to the intervention, participants exhibited limited awareness and inadequate practices in managing family archives. After participating in the training, they demonstrated improved ability to identify, classify, and systematically preserve essential documents. This finding aligns with previous studies highlighting the importance of archival literacy in safeguarding vital records and supporting access to civil rights and public services (Nurtanzila & Sholikhah, 2021). Family archives, such as identity cards, educational certificates, and land ownership documents, serve as legal evidence required to access education, healthcare, and administrative services (Sugiharto, 2012; Pratama, 2019).

Therefore, strengthening archival literacy through participatory approaches contributes not only to individual awareness but also to broader societal resilience. By equipping communities with the knowledge and skills to manage vital records, PAR promotes self-reliance and reduces vulnerability to administrative and legal disruptions following disasters. These findings highlight the strategic role of community-based education in enhancing preparedness and fostering sustainable development in vulnerable regions.

### **b. Digitalization of Family Archives for Preservation and Disaster Risk Reduction**

The study highlights the transformative role of digitizing family archives in protecting vital documents, particularly in disaster-prone environments. The significant improvement in participants' digital archiving skills demonstrates the effectiveness of technology-based interventions in enhancing disaster preparedness. Digitization is recognized as a fundamental preservation strategy in archival science, as it minimizes physical handling and safeguards fragile materials from deterioration (VanSnick & Ntanos, 2018; Zahara & Salim, 2022). By converting physical records into digital formats, families can ensure the longevity and security of essential documents.

The importance of digital preservation is evident in the context of the flash floods in Batu City, where many residents lost vital documents. Creating digital copies

enables families to mitigate risks associated with floods, fires, humidity, and aging paper (Barlindhaug, 2022). These findings support previous research emphasizing the significance of archival preservation in disaster mitigation and recovery (Suliyati, 2017). Consequently, digital archiving serves as an effective preventive strategy, ensuring administrative continuity and facilitating post-disaster rehabilitation.

Beyond risk mitigation, digitalization also enhances accessibility and efficiency in managing family records. Digital archives enable rapid retrieval and secure storage, ensuring that essential documents remain accessible when needed. This technological adaptation strengthens community preparedness and reduces vulnerability, positioning digital archiving as a sustainable and scalable solution for disaster risk reduction in vulnerable communities.

### **c. Digital Family Archives as Instruments of Identity, Memory, and Accessibility**

Beyond their administrative function, family archives play a crucial role in preserving identity, collective memory, and intergenerational continuity. Reyes and Irvin (2024) describe a family archive as a home for data that safeguards historical narratives, traditions, and cultural values across generations. Digitization enhances the longevity and accessibility of these records, ensuring that family histories remain preserved and accessible in the digital era. This perspective reinforces the role of archives as enduring symbols of identity and continuity.

Advancements in digital technology further enable archives to be accessed and shared across geographical boundaries, strengthening familial connections and promoting cultural literacy. Digital archives allow families dispersed across regions or countries to access shared records simultaneously, fostering intergenerational engagement and cultural preservation (Jaillant et al., 2022; Blanke, 2024). Such accessibility contributes to the democratization of information and broadens participation in heritage preservation.

In addition, the digital era has generated extensive personal data, including photographs, videos, and social media content, forming what is known as a personal digital legacy. When curated and preserved effectively, these materials become valuable cultural and historical resources for future generations (Gudmundsdottir, 2023; Nagy & Kiszl, 2021). Thus, digital archiving transforms family records into enduring sources of identity, memory, and knowledge.

### **d. Implications for Social Resilience and Community Empowerment**

One of the most significant contributions of this study is its demonstration that digitizing family archives strengthens social resilience. Social resilience refers to a community's capacity to anticipate, withstand, and recover from adverse events while maintaining essential social structures. By enhancing participants' knowledge and digital competencies, the intervention improved their preparedness and adaptive capacity in disaster-prone contexts.

Family archives serve as legal evidence that ensures access to social services, civil rights, and economic opportunities. Their preservation supports administrative continuity and post-disaster recovery, thereby reinforcing social stability. This finding supports Rosenberg (2011) assertion that family archives function as enduring records of identity and continuity across generations.

Moreover, the participatory nature of the intervention fostered community engagement, technological empowerment, and collective awareness. The model proposed in this study offers a replicable framework for strengthening resilience by integrating digital literacy, archival preservation, and community participation. Although conducted in Batu City, Indonesia, the findings hold global relevance for disaster-prone regions worldwide..

#### IV. CONCLUSION

This study demonstrates that digitizing family archives significantly strengthens the social resilience of disaster-affected communities. Implemented through a Participatory Action Research (PAR) approach, the intervention effectively engages participants' knowledge and skills in managing and preserving vital documents. The findings indicate substantial improvements in archival literacy and digital archiving competencies, enabling participants to digitize, organize, and securely store essential records. These outcomes highlight the strategic role of digital archiving in safeguarding civil identity, ensuring administrative continuity, and supporting post-disaster recovery.

This research contributes to the fields of archival studies and disaster management, both theoretically, methodologically, and practically. It positions family-level digital archiving as an innovative strategy for strengthening social resilience while demonstrating the effectiveness of participatory approaches in community empowerment. Practically, the study proposes a replicable community-based model that integrates digital literacy, archival preservation, and disaster preparedness. Despite its contextual limitations, the findings offer valuable insights for policymakers, archival institutions, and community organizations, with broader relevance for disaster-prone regions worldwide.

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