

ECONOMIC RECOVERY OF FARMERS THROUGH DIGITAL PUBLIC SERVICE DELIVERY USING THE PISODAPUR PLATFORM AFTER THE CIANJUR EARTHQUAKE

Agung Edi Rustanto¹, Iis Kartini², Featy Octaviany³, Wuwuh Handayani⁴, and Teguh Sandjaya⁵

¹Faculty of Economics and Business, Universitas Esa Unggul, West Jakarta, DKI Jakarta, 11510

²Faculty of Economics, Universitas Putra Indonesia Cianjur, Cianjur, West Java, 43215

³Computerized Accounting Study Program, Politeknik LP3I Jakarta, Central Jakarta, DKI Jakarta, 10450

⁴Faculty of Administrative Sciences, Institut Ilmu Sosial dan Manajemen STIAMI, Central Jakarta, DKI Jakarta, 10530

⁵Faculty of Social and Political Sciences, Universitas Padjadjaran, Sumedang, West Java, 45363

E-mail: agung.edi@esaunggul.ac.id

ABSTRACT

This study analyzes the economic recovery of farmers after the 2022 Cianjur earthquake through digital public service delivery using the PISODAPUR platform. It examines the platform's role in mapping disaster victims and economic losses, distributing aid, and supporting farmers' access to recovery services, while identifying implementation barriers. A qualitative case study was conducted through semi-structured interviews with 15 informants, field observations, and document analysis; the data were coded thematically using NVivo. The findings show that farmers' livelihoods have gradually improved, but recovery remains fragile because of damage to housing, livestock, agricultural land, and irrigation infrastructure. PISODAPUR has improved the reporting of victims' conditions, aid requests, data transparency, and coordination among stakeholders. Nevertheless, its direct contribution to agricultural economic recovery remains limited, particularly regarding market access, financing, and technology-based business redevelopment. Its effectiveness is further constrained by unstable internet connectivity, limited smartphone access, low digital literacy, and insufficient awareness among affected farmers. Community cooperation, assistance teams, and inter-agency coordination support implementation. The study concludes that PISODAPUR functions more effectively as a governance and coordination instrument than as a direct driver of farmers' economic recovery. Strengthening rural digital infrastructure, digital literacy, data verification, and agriculture-specific service features is therefore necessary.

Keywords: economic recovery; post-earthquake farmers; digital public service; PISODAPUR platform; qualitative case study

PEMULIHAN EKONOMI PETANI MELALUI PELAYANAN PUBLIK DENGAN PENERAPAN TEKNOLOGI PLATFORM PISODAPUR PASCA GEMPA BUMI CIANJUR

ABSTRAK

Penelitian ini menganalisis pemulihan ekonomi petani setelah Gempa Cianjur 2022 melalui penyelenggaraan pelayanan publik digital menggunakan platform PISODAPUR. Kajian mencakup peran platform dalam pemetaan korban dan kerugian ekonomi, penyaluran bantuan, dukungan terhadap akses petani pada layanan pemulihan, serta hambatan implementasinya. Penelitian menggunakan pendekatan kualitatif dengan metode studi kasus melalui wawancara semi-terstruktur terhadap 15 informan, observasi lapangan, dan analisis dokumen; data dikodekan secara tematik menggunakan NVivo. Hasil penelitian menunjukkan bahwa penghidupan petani mulai membaik secara bertahap, tetapi proses pemulihan masih rapuh karena kerusakan rumah, ternak, lahan pertanian, dan infrastruktur irigasi. PISODAPUR membantu pelaporan kondisi korban, pengajuan bantuan, transparansi data, dan koordinasi antar-pemangku kepentingan. Namun, kontribusi langsungnya terhadap pemulihan ekonomi pertanian masih terbatas, khususnya dalam akses pasar, pembiayaan, dan pemanfaatan teknologi untuk membangun kembali usaha. Efektivitas platform juga dibatasi oleh ketidakstabilan jaringan internet, keterbatasan akses terhadap telepon pintar, rendahnya literasi digital, dan belum meratanya pengetahuan petani terdampak mengenai PISODAPUR. Kerja sama masyarakat, tim pendamping, dan koordinasi antarlembaga menjadi faktor pendukung. Penelitian ini menyimpulkan bahwa PISODAPUR lebih efektif sebagai instrumen tata kelola dan koordinasi daripada sebagai penggerak langsung pemulihan ekonomi petani. Oleh karena itu, diperlukan penguatan infrastruktur digital perdesaan, literasi digital, verifikasi data, dan fitur layanan yang secara khusus mendukung sektor pertanian.

Kata kunci: pemulihan ekonomi; petani pascagempa; pelayanan publik digital; platform PISODAPUR; studi kasus kualitatif

INTRODUCTION

Post-earthquake agricultural economic recovery in Cianjur remains a critical challenge because the earthquake disrupted not only physical infrastructure but also productive assets, market access, distribution channels, and public service delivery. The earthquake occurred on 21 November 2022 with a magnitude of 5.6 and caused widespread damage across Cianjur (BMKG, 2022). In the agricultural sector, these disruptions intensified farmers' vulnerability and threatened household food security. Qotrunada et al. (2024) reported a post-earthquake desirable dietary pattern score of 82.72 in Cugenang Subdistrict, indicating that food security had not fully recovered.

Post-disaster agricultural recovery cannot rely solely on emergency relief. Sapanli et al. (2023) emphasized the need for integrated interventions, including physical and psychological support for affected farmers, rehabilitation of agricultural infrastructure, provision of production inputs, strengthening of farmer institutions and social capital, development of disaster-responsive agribusiness models, commodity diversification, and reinforcement of agricultural supply chains through digital information systems. Digital platforms may therefore contribute to recovery by improving access to information, coordination, and the distribution of assistance.

The Cianjur earthquake illustrates how a disaster can interrupt the wider socioeconomic system through damage to housing, roads, irrigation, agricultural facilities, and local distribution networks. Recovery is therefore not limited to physical reconstruction; it also involves restoring production capacity, employment, income, access to services, and community resilience. Evidence from post-disaster recovery in Sibalaya Utara Village similarly shows that social and economic restoration must proceed simultaneously, including the recovery of housing, health, education, production activities, and income (Devinta et al., 2020).

From a public service perspective, these interconnected losses create a recovery chain in which one unresolved problem can delay progress in other areas. Restoring a house does not automatically restore agricultural production when irrigation remains damaged, livestock have been lost, or farmers cannot reach buyers. Similarly, the availability of assistance does not ensure recovery when information is

fragmented, beneficiary data are inaccurate, or service procedures are difficult to understand. Post-disaster recovery therefore requires public services that connect damage assessment, beneficiary verification, infrastructure rehabilitation, production support, financing, and market access. This integrated view is particularly important for farmers because their household welfare and productive activity are closely linked. A service intervention that responds only to immediate physical damage may reduce short-term vulnerability but leave the underlying livelihood system unable to generate stable income.

Theoretically, this study is situated at the intersection of public service delivery, digital governance, and post-disaster recovery. The public service delivery perspective emphasizes accessible, responsive, accurate, and equitable services, particularly during crises. Digital governance highlights the use of information and communication technology to strengthen transparency, accountability, efficiency, coordination, and evidence-based decision-making. The post-disaster recovery perspective extends attention beyond emergency response toward the restoration of long-term social and economic capacities.

These perspectives are relevant because the recovery of farmers' livelihoods depends not only on the availability of aid, but also on the quality of the public service mechanisms through which information, verification, coordination, and assistance are delivered. Indonesia's legal framework for electronic information and public services has encouraged technology-based service delivery; however, the presence of regulations and digital systems does not automatically ensure that services are inclusive, responsive, or effective for disaster-affected rural communities.

In this study, the quality of digital public service delivery is interpreted through the relationship between technology and the institutional process surrounding it. A platform may accelerate the circulation of information, but its public value depends on whether the information is accurate, understandable, actionable, and accessible to different groups of users. In a disaster-affected rural setting, accessibility also includes the availability of assisted channels for residents who cannot operate the platform independently. Responsiveness requires that submitted reports lead to verification and follow-up, while equity requires that people with weak

connectivity, limited devices, or low digital literacy are not excluded from beneficiary data. Transparency is equally important because affected residents need to understand how reports are processed, how priorities are determined, and how assistance decisions are connected to recorded needs. Thus, evaluating PISODAPUR requires attention not only to its technical features but also to the service chain that converts digital records into concrete recovery action.

Within this context, PISODAPUR is a relevant digital public service platform developed by the West Java Provincial Government for disaster management. The platform provides information related to disaster locations, citizen reports, logistics, aid requests, beneficiary verification, damaged housing, public facilities, and emergency coordination. These functions potentially improve information accessibility, transparency, inter-agency coordination, and the monitoring of aid distribution.

PISODAPUR should therefore be understood not merely as a technological application, but as a digital public service mechanism. Its value for farmers depends on whether the platform can translate disaster data and administrative coordination into accessible and appropriate recovery support, including accurate victim mapping, timely aid, restoration of agricultural production, and improved access to markets and financing.

Despite the growing literature on post-disaster recovery and digital governance, previous studies have focused primarily on emergency response, logistics coordination, infrastructure rehabilitation, disaster communication, or general e-government performance. The role of a digital public service platform in supporting sector-specific economic recovery, particularly the recovery of farmers' livelihoods, remains underexplored.

This gap has both theoretical and practical significance. Theoretically, it raises the question of whether a digital disaster platform should be evaluated primarily by administrative performance or by the socioeconomic outcomes experienced by affected groups. Practically, it concerns the extent to which platform-based data can guide interventions that are tailored to the recovery requirements of a specific livelihood sector. By focusing on farmers, this study distinguishes between improvements in reporting, coordination, and transparency and improvements in production capacity, income,

financing, and market participation. This distinction enables a more precise assessment of what PISODAPUR currently accomplishes, what remains outside its service scope, and what institutional integration is required for digital public service delivery to contribute to sustainable agricultural recovery.

Furthermore, the effectiveness of digital platforms in rural disaster-affected areas cannot be assumed. Uneven internet coverage, limited access to devices, low digital literacy, incomplete self-reporting, and weak data updating may reduce the inclusiveness and accuracy of platform-based services. These conditions require an assessment of both the contribution and the practical limitations of PISODAPUR.

Against this background, the study addresses two questions: (1) How does PISODAPUR function as a digital public service platform in supporting the post-earthquake economic recovery of farmers in Cianjur? and (2) To what extent does PISODAPUR contribute to victim mapping, service transparency, aid coordination, and access to recovery support for affected farmers? Accordingly, the objective is to analyze the role and effectiveness of PISODAPUR as a digital public service platform in facilitating farmers' economic recovery after the Cianjur earthquake.

METHOD

This study employed a qualitative descriptive approach with a case study method to examine the use of PISODAPUR in the post-earthquake recovery of farmers in Cianjur. A case study enables an intensive and contextual examination of a specific program, event, institution, or community in a real-life setting (Rahardjo, 2017). The case was bounded by the use of PISODAPUR among earthquake-affected communities and local officers involved in victim data collection and aid distribution.

The unit of analysis was the public service process through which PISODAPUR-related information, reporting, verification, coordination, and aid delivery were experienced by affected communities and implemented by relevant officers. The qualitative descriptive design was selected because the study sought to explain how the platform operated in practice and how its contribution was interpreted by users and service providers, rather than to test a predetermined causal model. The case study strategy also made it possible to examine the plat-

form within the post-earthquake institutional and socioeconomic context, where technological functions, field verification, community assistance, and government coordination could not be separated from one another.

The research focus was established to delimit data collection and ensure that the evidence remained aligned with the research objectives (Moleong, 2014). The focus consisted of the following areas:

- Post-Earthquake Economic Recovery of Farmers through PISODAPUR
 1. Economic conditions after the earthquake
 2. The role of PISODAPUR in economic recovery
 3. Effectiveness in market access, capital access, and technological support
 4. Supporting and inhibiting factors
- Mapping of Disaster Victims and Economic Losses
 1. Utilization of technology in mapping
 2. Effective mapping methods
 3. Factors affecting mapping accuracy
- Effectiveness of Aid Distribution to Affected Farmers
 1. Mechanisms and targeting accuracy
 2. Indicators of aid distribution effectiveness

Data were collected through semi-structured interviews, follow-up unstructured probes, field observations, and document analysis. The combination of these techniques enabled the researcher to compare participants' accounts with observed service practices and documentary evidence. Data collection followed the qualitative research procedures described by Creswell (2016) and was adapted to field conditions in Cianjur Regency.

Each technique served a complementary purpose. Interviews were used to identify experiences, perceptions, service barriers, and evaluations of recovery support. Observations were used to examine how reporting, verification, platform access, and aid-related interactions occurred in the field. Documents were used to clarify platform functions, administrative records, policy context, and the consistency between recorded information and participants' accounts. This methodological combination was important because relying on a single

source could overstate either the formal capacity of the platform or the individual experience of a participant. The convergence and divergence among the three sources were therefore treated as analytical evidence.

Informants were selected based on their direct experience with or knowledge of the issues under investigation. They consisted of earthquake-affected farmers and residents, members of assistance teams, and local officers involved in PISODAPUR-based data collection or aid delivery. This composition allowed the study to capture both service-user and service-provider perspectives.

Purposive sampling was used to select 15 informants who were considered capable of providing relevant and detailed information. Each interview lasted approximately 45 minutes, although the duration varied according to field conditions and the depth of the information provided. Interviews were conducted in a natural setting while maintaining informed participation, confidentiality, and academic research standards.

The number of informants was intended to provide adequate coverage of the principal perspectives relevant to the case rather than statistical representation of the wider population. The inclusion of affected farmers and residents, assistance-team members, and local officers enabled comparison between the demand side and the delivery side of the service. Attention was given to recurring patterns as well as contrasting experiences, particularly differences in platform familiarity, digital access, receipt of assistance, and understanding of the relationship between PISODAPUR and aid distribution.

Field observations focused on the processes of reporting victims' conditions, mapping losses, verifying data, accessing PISODAPUR, and distributing aid. Observation was conducted systematically using aspects derived from the research focus and continued until the researcher obtained sufficient evidence to explain recurring patterns and differences across locations and informant groups.

Documentary data included platform information, records related to disaster victims and aid distribution, relevant policy documents, and scientific literature. These materials were used to clarify the institutional functions of PISODAPUR and to compare recorded information with interview and observation findings.

Data credibility was strengthened by comparing information across interviews, observa-

tions, and documents, as well as through discussions with academic supervisors and colleagues familiar with the topic. Data were considered credible when the interpretation was consistent with the evidence obtained from the research setting (Sugiyono, 2016).

Confirmability was maintained through an audit trail of interview notes, observation records, documents, coding decisions, and thematic interpretations. This procedure helped ensure that the findings were derived from the collected evidence rather than from unsupported assumptions or researcher preferences.

Data analysis followed six qualitative procedures adapted from Creswell (2016): (1) organizing and preparing the data; (2) reading the complete dataset to obtain an overall understanding; (3) coding meaningful data segments; (4) grouping codes into categories and themes; (5) presenting the themes in a coherent qualitative narrative; and (6) interpreting the meaning of the findings in relation to the research questions and relevant literature. NVivo software was used to organize the data, coding structure, and thematic relationships; interpretation remained the responsibility of the researcher.

During coding, evidence related to economic losses, livelihood recovery, platform functions, mapping, verification, aid mechanisms, digital access, and institutional coordination was first organized into descriptive codes. These codes were then compared across informant groups and data sources and grouped into broader categories. The categories were refined into the four themes reported in the results section. Interpretive attention was directed to the difference between administrative outputs, such as improved reporting and coordination, and recovery outcomes, such as restored production, capital access, market access, and income. Negative or inconsistent evidence was retained in the analysis so that the final interpretation did not present the platform as uniformly effective.

RESULTS AND DISCUSSION

The results and discussion are organized around four themes derived from interviews, field observations, document analysis, and thematic coding in NVivo: (1) farmers' economic recovery and the role of PISODAPUR; (2) digital mapping of disaster victims and economic losses; (3) the effectiveness of aid distribution; and (4) supporting and inhibiting factors. The

analysis distinguishes the platform's contribution to governance and coordination from its direct contribution to the restoration of agricultural livelihoods.

Economic Recovery of Farmers after the Cianjur Earthquake through the PISODAPUR Digital Public Service Platform

Post-Earthquake Economic Conditions

Interview and observation data show that the earthquake severely affected farmers' economic conditions. Damage to houses, livestock shelters, agricultural land, and irrigation channels interrupted production and reduced household income. Landslides blocked several irrigation channels, livestock died when structures collapsed, and some farmers temporarily lost access to their fields and markets. Although daily activities have gradually resumed, recovery remains incomplete and uneven.

The findings indicate that physical reconstruction alone is insufficient to restore agricultural livelihoods. Farmers require continued support for production assets, irrigation, livestock replacement, working capital, and market access. This result is consistent with Sapanli et al. (2023), who emphasized that post-earthquake agricultural recovery requires integrated interventions covering infrastructure, production inputs, farmer institutions, social capital, agribusiness, and supply chains. Purwanto et al. (2023) and Mahanani et al. (2024) similarly documented extensive physical damage and its wider social and economic consequences in Cianjur.

The pattern observed in Cianjur indicates that agricultural recovery is multidimensional and sequential. Damage to productive assets directly reduces the ability to farm, while damage to housing and public infrastructure diverts household resources and attention away from production. Even when farming activity resumes, reduced livestock holdings, disrupted irrigation, limited working capital, and unstable distribution channels can keep output and income below pre-disaster conditions. The gradual resumption of daily activity should therefore not be interpreted as complete economic recovery. Rather, it reflects an early stage in which households have regained part of their routine but remain vulnerable to new production shocks and additional expenses. This distinction is important for public service evalua-

tion because a program may be successful in delivering emergency assistance while still being insufficient to restore a viable livelihood. The findings support the view that recovery policy must connect humanitarian assistance with medium-term rehabilitation and longer-term economic strengthening.

The Role of PISODAPUR in Economic Recovery

PISODAPUR has played a supportive role by enabling the reporting of victims' conditions, the submission and monitoring of aid requests, the presentation of damage information, and beneficiary verification. These functions improve the visibility of community needs and facilitate coordination among government agencies, local officers, assistance teams, and affected residents. For farmers, the platform's most immediate benefit is improved access to disaster-related information and administrative services.

However, the platform's contribution to economic recovery is primarily indirect. PISODAPUR strengthens transparency, data management, and institutional coordination, but it does not independently restore production capacity or income. Its contribution becomes meaningful when platform data are connected to agricultural rehabilitation programs, infrastructure recovery, production assistance, financing, and market-support mechanisms. This finding positions PISODAPUR as a foundational governance instrument rather than a complete economic recovery solution.

This indirect contribution can be understood as a governance pathway. PISODAPUR first increases the visibility of losses and assistance needs; the information can then support verification, prioritization, coordination, and resource allocation. Economic recovery occurs only when these administrative processes are followed by interventions that restore productive capacity. Consequently, the platform should not be assessed as though the recording of damage automatically produces income recovery. Its effectiveness depends on the institutional response generated after the data are received. Where platform information is regularly updated, verified, and incorporated into agricultural programs, it can reduce information gaps and improve the alignment between assistance and need. Where follow-up programs are weak or disconnected, the platform

may produce better administrative knowledge without substantially changing farmers' economic conditions. This explains why participants could recognize improvements in reporting and coordination while continuing to experience limitations in capital, markets, irrigation, and production support.

Effectiveness in Market Access, Capital Access, and Technological Support

The platform has not yet met farmers' expectations regarding market access, capital, and technology-based business redevelopment. Informants generally understood PISODAPUR as a disaster information and aid-reporting system rather than a service that connects farmers with buyers, financing institutions, agricultural inputs, price information, or business assistance. Government support received by farmers was also more frequently related to housing or physical rehabilitation than to working capital and market recovery.

Consequently, PISODAPUR's current design does not fully address the sector-specific needs of agricultural recovery. Its economic relevance could be strengthened by integrating market and price information, agricultural supply-chain data, financing referrals, production assistance, and follow-up services for affected farmers. Such integration would allow digital public service delivery to move beyond administrative coordination toward the restoration of sustainable farming livelihoods.

A sector-specific recovery function would require more than adding general information to the platform. It would require a service architecture that links farmer profiles and verified loss data with responsible agencies, program eligibility, referral mechanisms, and follow-up status. For example, information about damaged irrigation or lost livestock would need to be connected to the unit responsible for rehabilitation or replacement support, while information about disrupted sales would need to inform market and supply-chain interventions. Financing referrals would also need clear criteria and assistance for farmers who lack formal documents or digital skills. In this sense, platform development should proceed together with institutional integration. New features would have limited value if agencies did not share data, define responsibilities, and respond within an understandable service workflow. The results therefore suggest that the principal devel-

opment need is not simply technological expansion, but the integration of digital information with agricultural recovery programs and accountable follow-up.

Mapping of Disaster Victims and Economic Losses through Digital Public Service Data

Utilization of Technology in Mapping

PISODAPUR has improved the organization and accessibility of disaster data. The platform consolidates information that would otherwise be dispersed across institutions and locations, thereby supporting faster monitoring and decision-making. Interview and documentary evidence indicate that its mapping functions are generally useful, but their accuracy depends on continuous updating, coordination among data providers, and verification at the village level.

The main categories of information relevant to victim mapping include:

1. Casualties, injured persons, and affected residents
2. Citizen reports and the status of report processing
3. Damaged houses, agricultural assets, and public infrastructure
4. Affected villages, sub-districts, and disaster locations
5. Aid requests, logistics information, and beneficiary verification

The principal limitation is that post-disaster data are dynamic. Information can quickly become outdated when changes in victims' conditions, displacement, damage, or assistance are not entered promptly. PISODAPUR must therefore be supported by clear data responsibilities, regular updating schedules, and mechanisms for correcting inconsistent or incomplete records.

Accurate and timely information is central to disaster communication and response. Nugroho and Sulistyorini (2019) emphasized the dependence of disaster communication on reliable data, while Lai and Tang (2021) showed that information channels influence how people obtain and share disaster information. PISODAPUR's value is therefore determined not only by the existence of a digital interface, but also by the quality, completeness, timeliness, and usability of the data it contains.

The findings further show that data quality is a governance issue rather than only a techni-

cal issue. Completeness depends on who is able and willing to report; accuracy depends on the clarity of categories and the quality of verification; timeliness depends on institutional responsibility for updating records; and usability depends on whether decision-makers can translate the data into priorities. A platform can display large quantities of information while still producing weak decisions if records are duplicated, outdated, or insufficiently specific. For agricultural recovery, general categories of housing damage or affected population may also be inadequate unless data capture the productive consequences of the disaster, including loss of livestock, damage to land and irrigation, interruption of cultivation, and constraints on market access. Strengthening PISODAPUR therefore requires both technical data management and agreement among institutions about what information must be collected, who validates it, and how it will be used.

Effective Mapping Method

The findings indicate that the most effective method is a hybrid mapping approach that combines digital reporting with direct field verification. PISODAPUR improves the speed, accessibility, and integration of data, whereas field visits enable officers to confirm losses, identify households that have not submitted reports, and clarify discrepancies between online records and actual conditions.

Relying solely on self-reporting creates the risk of incomplete data because some affected farmers lack internet access, smartphones, digital skills, or knowledge of the reporting mechanism. Conversely, relying entirely on manual field surveys reduces the speed of updating and limits the ability of decision-makers to monitor changes in real time. Combining both approaches provides a more appropriate balance between efficiency and accuracy.

The hybrid approach should involve initial digital registration, village-level verification, correction of incomplete records, and periodic synchronization between field findings and the platform database. This procedure would reduce exclusion errors and improve the targeting of aid, particularly for older farmers and residents in areas with weak connectivity.

Digital mapping should therefore be treated as an institutional process rather than merely a technical function. Its effectiveness depends on coordination, operational standards, responsi-

ble data officers, community assistance, and a feedback mechanism through which affected residents can correct inaccurate information.

The hybrid method also provides an inclusion mechanism. Digital registration offers speed and broad visibility, while field verification compensates for unequal access and enables the identification of residents who are missing from the system. However, field verification will only improve inclusion when officers have clear procedures for adding unregistered households, correcting inaccurate records, documenting changes, and communicating the result to affected residents. Without such procedures, the hybrid approach may simply reproduce separate digital and manual datasets. Periodic synchronization is therefore essential so that corrections made in the field become part of the official platform record. A feedback channel is also required because affected farmers are not merely data subjects; they need an opportunity to verify whether their losses and assistance status have been recorded correctly. This participatory dimension would strengthen trust and reduce uncertainty regarding the use of disaster data.

Factors Affecting Mapping Accuracy

Three factors consistently influenced mapping accuracy: coordination in data collection, honesty and completeness in reporting, and the frequency and quality of data updates. Weak coordination can produce duplicate or inconsistent records, while incomplete community reporting can exclude eligible victims. Delayed updates also cause the platform to display conditions that no longer reflect developments in the field.

These limitations affect the equity and timeliness of aid distribution. When mapping is inaccurate or slow, assistance may be delayed, directed to the wrong location, or distributed without reflecting the most urgent needs. Clear data standards, cross-checking among institutions, village-level verification, and transparent correction procedures are therefore necessary to maintain the platform's credibility and usefulness.

Effectiveness of Aid Distribution through the PISODAPUR Digital Public Service Platform

Mechanism and Targeting Accuracy

Aid distribution was implemented in the affected areas, but many farmers did not clearly understand how PISODAPUR was connected to the aid mechanism. Some informants received assistance without directly interacting with the platform, while others were unfamiliar with the stages of reporting, verification, approval, and follow-up. This limited understanding reduced the platform's visibility as a public service channel.

Field observations and document analysis also identified uneven allocation and several cases in which recorded information did not fully correspond to actual needs. These discrepancies were closely related to incomplete or delayed mapping. The platform can support more accurate targeting, but only when digital records are verified and connected to transparent criteria for beneficiary selection and aid prioritization.

Improvements should therefore focus on publishing a clear aid-service workflow, strengthening village-level assistance, communicating eligibility and verification criteria, and providing residents with an accessible mechanism to check or correct their status. These steps would improve accountability and reduce uncertainty among affected farmers.

Indicators of Aid Distribution Effectiveness

The effectiveness of aid distribution can be assessed through three dimensions: accuracy, speed, and sustainability. Accuracy concerns whether assistance reaches eligible farmers and corresponds to their needs. Speed concerns the time required for reporting, verification, approval, and delivery. Sustainability concerns whether assistance only addresses immediate needs or also contributes to the medium- and long-term restoration of farmers' livelihoods.

Digital communication can support rapid information exchange during disasters. Houston et al. (2015) emphasized the importance of communication and media for community resilience, while Dargin et al. (2021) and Kim and Hastak (2018) showed both the benefits of digital networks and the risks created by unequal access. In the PISODAPUR context, real-time information can improve speed and coordination, but the digital divide can prevent some farmers from receiving equal service benefits.

The evidence suggests that PISODAPUR contributes more strongly to the accuracy and

speed of administrative coordination than to the sustainability of agricultural recovery. Sustainable outcomes require the platform to be connected to longer-term programs for production recovery, working capital, markets, technology adoption, and agricultural infrastructure. Aid effectiveness should therefore be evaluated beyond the completion of distribution activities and should include the extent to which farmers can resume viable economic activity.

The three dimensions also reveal a potential imbalance in program assessment. Administrative reports may emphasize the number of records processed, the speed of coordination, or the completion of aid distribution. These indicators are important, but they do not show whether the assistance matched the productive losses experienced by farmers or enabled them to resume sustainable economic activity. Accuracy should therefore be evaluated at two levels: administrative accuracy, referring to the correct identification of beneficiaries, and substantive accuracy, referring to the suitability of assistance for the actual recovery need. Speed should likewise be assessed not only as rapid delivery but also as timely delivery at the stage when farmers need inputs, working capital, or infrastructure support. Sustainability requires follow-up beyond the initial transaction. This broader evaluation would prevent the platform's administrative achievements from being interpreted as equivalent to livelihood recovery and would provide a stronger basis for improving future interventions.

Supporting and Inhibiting Factors in the Implementation of the PISODAPUR Digital Public Service Platform

The dominant inhibiting factors were unstable internet connectivity, limited access to smartphones, low digital literacy, limited awareness of PISODAPUR, and the older age profile of many affected farmers. These barriers restricted independent platform use and increased reliance on family members, village officers, volunteers, and assistance teams. They also created a risk that digitally excluded farmers would be underrepresented in the platform's data.

The principal supporting factors were cooperation among community members, assistance from local teams, inter-agency coordination, and outreach activities. Community members and support teams helped farmers submit infor-

mation, understand aid procedures, and receive updates. Abdurrasyid et al. (2023) similarly identified collaboration, program implementers, and community participation as important factors in post-earthquake volunteer activities.

These findings indicate that digital inclusion must be treated as part of service design. Improving connectivity and digital literacy is essential, but the platform should also provide assisted-service channels, simple interfaces, village-level help desks, and alternative reporting mechanisms. Such measures would ensure that PISODAPUR remains accessible to farmers who cannot use digital services independently and would strengthen its role in inclusive post-disaster governance.

Assisted access is therefore not a temporary substitute for digitalization but a necessary component of an inclusive service model. In the Cianjur context, family members, village officers, volunteers, and assistance teams acted as intermediaries between farmers and the platform. Their role helped overcome barriers, but dependence on informal assistance can produce uneven service quality when support is unavailable or when intermediaries do not have complete information. Institutionalizing this function through village-level help desks, trained facilitators, standard operating procedures, and clear referral contacts would make access more consistent. At the same time, assisted service should be designed to preserve the farmer's ability to understand, confirm, and correct the information submitted on his or her behalf. Digital inclusion therefore involves infrastructure, skills, interface simplicity, human assistance, and procedural safeguards. Addressing only one of these elements would leave significant exclusion risks unresolved.

Across the four themes, a consistent analytical pattern emerges. PISODAPUR is strongest at the stages of information aggregation, reporting, transparency, and inter-organizational coordination. Its performance becomes weaker as the service chain moves toward sector-specific follow-up and long-term livelihood outcomes. This does not mean that the platform is unimportant to economic recovery. Rather, it means that digital public service creates enabling conditions whose value depends on data quality, inclusive access, institutional responsiveness, and integration with substantive recovery programs. The platform can help government identify who is affected, where losses occur, and

what assistance is requested, but other institutions and programs must convert that information into irrigation repair, production inputs, livestock recovery, working capital, market connections, and technological assistance. The central policy implication is therefore to shift from a platform-centered approach to an integrated service-system approach in which technology supports a coordinated recovery pathway.

CONCLUSION

This study finds that post-disaster agricultural economic recovery in Cianjur remains gradual, uneven, and fragile. Although farmers have begun to restore housing, livestock, agricultural land, and daily activities, their needs related to production assets, irrigation, market access, capital, and agricultural technology have not been fully addressed. PISODAPUR has improved the reporting of victims' conditions, data transparency, beneficiary verification, aid coordination, and access to disaster-related public services; however, its direct contribution to the recovery of farming livelihoods remains limited.

Theoretically, the findings show that a digital public service platform in a post-disaster setting functions more effectively as an instrument of governance, coordination, transparency, and information management than as a direct driver of sectoral economic recovery. Its effectiveness is shaped by governance capacity, data quality, institutional integration, and digital inclusion. The study therefore extends the literature on digital public service by demonstrating that platform-based interventions must be aligned with the specific recovery needs of the agricultural sector.

From a practical perspective, local and provincial governments should reposition PISODAPUR as an integrated recovery service rather than only a disaster-response and data platform. Priority actions include strengthening rural digital infrastructure, improving farmers' digital literacy, implementing hybrid data verification, clarifying aid-service workflows, and developing agriculture-specific features related to market and price information, supply-chain coordination, financing referrals, production assistance, and assisted access for digitally excluded users.

Future studies should examine the long-term effects of digital public services on farm-

ers' livelihood recovery and economic resilience. Quantitative or mixed-method approaches could assess relationships among platform utilization, service quality, institutional capacity, aid effectiveness, and farmers' economic outcomes. Comparative studies across regions and disaster types are also recommended to identify the conditions under which digital public service platforms can move beyond administrative coordination and support sustainable sectoral recovery.

Overall, the study emphasizes that the success of post-disaster digitalization should not be measured solely by the existence of a platform or the volume of information processed. It should be measured by whether affected citizens can access the service, whether their conditions are represented accurately, whether institutions respond to verified needs, and whether the resulting interventions restore sustainable livelihoods. For PISODAPUR, progress toward this outcome requires maintaining its governance strengths while extending the service chain from disaster data management to agriculture-specific recovery action.

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