

The Role of Local Government in Conserving Pandan Wangi Rice Farming Land in Cianjur Regency

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Abstract

Excessive conversion of agricultural land for industrial or residential uses has reduced the supply of *pandan wangi* rice due to shrinking farmland. This study aims to identify and analyze the local government's role, the inhibiting factors, and efforts to overcome obstacles in preserving *Pandan Wangi* rice farming land in Cianjur Regency. Using a qualitative descriptive method based on Sondang P. Siagian's theory (2009: 132), the research involved 18 informants and used primary and secondary data. Data collection included interviews, observation, and documentation, with analysis through data reduction, presentation, and conclusion drawing. Findings show the government protects *Pandan Wangi* rice land by formulating and enforcing regulations, notably Regional Regulation No. 19/2012 for *Pandanwangi* preservation, supported by Spatial Planning Regulation No. 4/2019. Integrated spatial planning uses agro-ecological maps and GIS for land zoning, buffer zones, and core area protection. Preservation is embedded in *RPJMD/RKPD* documents to align all sectoral policies with the protection of *Pandanwangi* fields. Routine coordination forums involve the Agriculture Service, Spatial Planning Service, *Bappeda*, Environmental Service, *MP3C*, and village governments. Stakeholder engagement includes farmer groups, *MP3C*, academics, NGOs, and market players in Village *Musrenbang/Musrenbangcam*, public forums, and technical workshops. Sustainable land management is enforced through soil and water conservation practices like terracing, legume rotation, organic mulch, and micro irrigation. Promotion and product image strengthening are achieved by supporting Geographical Indications for *Pandanwangi* rice to protect its authenticity and increase its premium market value.

Keywords: Role of Government, Land Protection, Pandan Wangi Cianjur

INTRODUCTION

Indonesia is an agrarian country with fertile land and has a lot of agricultural land, Indonesia is an agrarian country with fertile land and abundant agricultural areas, resulting in a majority of the population working as farmers. Agricultural land, as a vital natural resource, is under state control as mandated by Article 33 Paragraph (3) of the 1945 Constitution, which states that "the earth, water, and the natural resources therein are controlled by the state and used for the greatest prosperity of the people." The agricultural sector plays a crucial role in Indonesia's economy, contributing 11.53% to the national Gross Domestic Product (GDP) in 2024 and growing by 1.30% amid economic recovery post-COVID-19 (Badan Pusat Statistik Republik Indonesia, 2023).

However, the increasing population and the conversion of agricultural land into non-agricultural uses—such as housing, industry, and infrastructure—have intensified the need for land resources. This transformation is driven by industrial development and urban expansion, often at the expense of agricultural sustainability. While such development can support economic growth, it poses serious long-term risks to agriculture, food security, and farmers' welfare (Dewinta & Warlina, 2017; Rohani Budi Prihatin, 2015).



Figure 1. Comparison of Rice Harvest and Production Area in Indonesia in 2023 and 2024

Source: BPS Republic of Indonesia, 2024

Rice paddies, particularly those near urban centers, are especially vulnerable to conversion. Factors such as high land prices, legal uncertainties, and insufficient policy enforcement contribute to this trend. The decline in agricultural land area affects not only food production but also threatens the livelihoods of rural communities (Afandi, 2011). This is evident in the 2024 decrease in national rice farmland by 1.64%, from 10.21 million hectares to 10.05 million hectares, which led to a reduction of 0.84 million tons in dry milled grain production (Badan Pusat Statistik Republik Indonesia, 2023).

Cianjur Regency, West Java, is renowned for its rice production, especially Pandanwangi rice, a premium local variety known for its fragrant aroma and soft texture. Despite its high market value and Geographical Indication (GI) certification obtained in 2018, Pandanwangi rice production continues to decline due to land conversion, pest attacks, and farmers shifting to faster-harvesting rice varieties (Koerniatmanto Soetoprawiro et al., 2021; Ramli & Sumiyati, 2015). From 2019 to 2023, the cultivation area of Pandanwangi rice in Warungkondang District dropped from 8,062 hectares to 4,262 hectares (MP3C, 2015).

To preserve this regional heritage and support food security, the Cianjur government enacted Regional Regulation No. 19 of 2012, aiming to protect Pandanwangi rice farmland and support farmer participation (Peraturan Daerah Kabupaten Cianjur Nomor 19 Tahun 2012). Despite this, challenges remain in implementation, particularly in law enforcement and farmer engagement (Munawaroh, 2019; M. Rendi Aridhayandi et al., 2019). Local institutions like MP3C were established to manage cultivation efforts and maintain GI certification. However, issues such as limited access to agricultural insurance (AUTP), low seed availability, and climate change risks persist (Dika Supyandi et al., 2018).

Previous studies by Yunus (2017) and Koerniatmanto Soetoprawiro et al. (2021) focused on macroeconomic impacts and legal aspects of GI, respectively, but lacked integration of regional policy analysis and farmer-level dynamics. This study addresses that gap by examining how local government initiatives, land protection policies, and institutional support interact to preserve Pandanwangi rice farmland. This integrated approach is expected to contribute to sustainable agricultural development and serve as a policy model for other regions.

RESEARCH METHOD

The population of this research included stakeholders involved in the cultivation and protection of Pandanwangi rice in Warungkondang District, Cianjur Regency, such as farmers, members of MP3C (Pandanwangi Rice Preservation Society), local agricultural officers, and policymakers. The sample was selected using a purposive sampling technique, which allowed the researcher to choose participants based on their relevance, knowledge, and experience in relation to the issue studied (Creswell, 2021). This method ensured that the data gathered was rich and contextually appropriate. Data collection techniques used in this study included in-depth interviews, observation, and document review (Miles & Huberman, 2021). The research instruments consisted of semi-structured interview guides developed based on the theoretical framework and research objectives. The validity of the data was ensured through triangulation by comparing interview results, policy documents, and field observations (Fiona Wood & Bloor, 2006). To strengthen reliability, the researcher consistently documented the research process and used verbatim transcriptions to preserve data integrity.

The research procedure was carried out through several stages: preliminary observations, participant identification, interview scheduling, data collection, and field note documentation. All data were organized using NVivo 12 software, which helped manage, code, and analyze qualitative textual data thematically. Data analysis was conducted following Miles and Huberman's (1994) model, which consisted of three steps: data reduction, data display, and conclusion drawing/verification. Data reduction involved summarizing and selecting relevant information; data display was done using matrices and thematic charts; while conclusion drawing was based on identifying emerging patterns, recurring themes, and constructing meaningful insights. Verification was carried out by cross-checking findings with key informants and using peer debriefing to ensure analytical accuracy. This methodological process allowed the researcher to construct a comprehensive understanding of the policy environment and challenges in preserving Pandanwangi rice cultivation amidst ongoing land-use pressures.

RESULT AND DISCUSSION

The Role of Local Governments in the Preservation of Pandan Wangi Rice Farmland in Cianjur Regency

The preservation of Pandanwangi Rice farmland in Cianjur Regency is one of the important efforts in maintaining local cultural and natural resources. Pandanwangi rice is one of the leading rice varieties that is very famous in Cianjur and has high economic value, especially because of the distinctive aroma and taste it produces. Therefore, the role of the local government in maintaining the sustainability of Pandanwangi Rice is very important, both in terms of policy, supervision, farmer assistance, and policy integration related to the sustainability of agricultural land.

The role of the local government in the preservation of Pandan Wangi Rice farmland in Cianjur Regency is very vital, considering that this commodity is not only part of the local identity but also has a significant impact on the economy and welfare of local farmers. In this context, local governments, both at the district and provincial levels, have several strategic roles that must be carried out to ensure the sustainability of Pandan Wangi Rice production and maintain the sustainability of the environment and existing natural resources.

Setting Function

The regulatory function in the role of local governments in the preservation of Padi Pandanwangi agricultural land in Cianjur Regency can be seen from several aspects that include regulations, policies, supervision, and law enforcement. The regulatory function focuses on how local governments regulate the use and protection of agricultural land, ensure the preservation of Pandanwangi Rice, and prevent illegal land conversion.

Policy Formulation Function

The policy formulation function is the stage where the Regional Government designs, formulates, and establishes strategic public policies to achieve development goals. In the context of the conservation of Pandan Wangi rice land, this function includes the study, design, and determination of policy instruments that prevent degradation and conversion of agricultural land.

1. **Spatial Planning and Arrangement:** Spatial planning is a strategic effort to design the use of regional space in the long term, while spatial planning is the determination of zoning rules and technical provisions for land use. Both aim to optimize the function of the economic, social, and environmental space to support the preservation of Pandan Wangi rice farmland.
2. **Stakeholder involvement in policy formulation:** Stakeholder engagement is the process of inviting various government parties, the community, academia, the private sector, and NGOs to actively participate in every stage of policy formulation. The goal is to ensure the resulting policies:
 - a. Relevant and responsive to needs and complaints in the field.
 - b. Legitimate because it has broad support
 - c. Effective because it takes into account local and technical knowledge
3. **Strengthening the farmer economy and diversifying income:** Strengthening the farmer economy is an effort to strengthen the financial capacity and productivity of farming businesses through fiscal policies, credit, subsidies, and market access. Income diversification: the provision of alternative sources of non-rice income, such as agro-tourism, yield processing, and micro-businesses around rice fields, so that farmers' economic resilience is more resilient and agricultural land is not easily replaced. The main goal is to ensure that Pandan Wangi farmers get adequate and sustainable income, as well as create economic incentives to continue to maintain the function of rice fields.

Based on the results of observations and analyses regarding the strengthening of farmers' economy and income diversification as part of the function of local government policy formulation in the preservation of Pandan Wangi rice land in Cianjur Regency above, it can be concluded that the diversification scheme (rice processing, agroforestry, ecotourism) has been carried out by 54% of the population, contributing an average of 20% to the total income per planting season. This shows the real potential for farmers to reduce dependence on primary income and increase household economic resilience. Access to working capital for alternative businesses is still limited (only 38% of farmers are touched by special revolving funds), accompanied by complex administrative procedures. Limited infrastructure and logistics, as well as the gap between training materials and market needs, are also significant obstacles.

Local governments, through the Agriculture Office, have formulated funding and incentive policies that facilitate working capital, technical subsidies, and training. However, the success of implementation still needs to be supported by simplification of procedures, acceleration of distribution, and cross-SKPD (Agriculture, Tourism, Trade) collaboration. With increased income diversification, the economic pressure to convert land shrinks. Farmers who have alternative sources of income tend to be more committed to maintaining traditional rice systems and conservation practices.

4. Funding and incentives for smallholders: Smallholder funding and incentives are policy instruments designed to provide financial, fiscal, and non-fiscal support to Pandan Wangi farmers. The goal is to encourage sustainable agricultural practices, prevent land conversion, and increase farmers' productivity and income.

Service Function

The service function is the role of the local government in providing and facilitating various public services that support so that policy goals, in this case the preservation of Pandan Wangi rice fields, can be achieved effectively, efficiently, and on target. Services include counseling, technical assistance, facilitation of access to agricultural inputs, and ease of administration.

Access to agricultural services and land protection

Agricultural services and farmers' land protection are efforts to strengthen the financial capacity and productivity of farming businesses through fiscal policies, credit, subsidies, and market access. Income diversification: the provision of alternative sources of non-rice income, such as agro-tourism, yield processing, and micro-businesses around rice fields, so that farmers' economic resilience is more resilient and agricultural land is not easily replaced. The main goal is to ensure that Pandan Wangi farmers get adequate and sustainable income, as well as create economic incentives to continue to maintain the function of rice fields. The results of the interview regarding access to agricultural services and land protection as a function of local government services in the preservation of Padi Pandan Wangi agricultural land in Cianjur Regency are described as follows:

The results of the author's interview with the Head of the Investment Office of One-Stop Integrated Services of Cianjur Regency as informant 2 stated that: The Office of Investment and One-Stop Integrated Services (DPMPTSP) has the main task of organizing licensing and non-licensing services in an integrated, efficient, and transparent manner. In the context of Pandan Wangi rice land conservation, DPMPTSP focuses on: Ensuring that farmers and agricultural investors obtain permits (e.g. location permits, agricultural business permits) quickly and easily. Overseeing the issuance of non-agricultural permits so as not to damage the Pandan Wangi rice fields, in accordance with spatial planning regulations. Some of his response points are as follows:

- a. One-Stop Service (OSS): DPMPTSP integrates agricultural licensing services into the National OSS, so farmers can apply for planting permits, extension recommendations, and organic certification through one door both online and offline.

- b. Farmer-specific service guidelines: Technical instructions and application packages for "Small Scale Agricultural Business Permit" are available for Pandan Wangi farmers, with simplified requirements (farmer group recommendation letter, simple map, and ID card).
- c. Mobile unit service: DPMPTSP operates an "Integrated Service Car" that travels to the sub-district to help farmers who have difficulty accessing offices. This service includes permit registration, regulatory consultation, and application status checking.

Based on the results of observations on access to agricultural services and land protection mechanisms in the context of preserving Pandan Wangi rice fields in Cianjur Regency, it can be concluded that the OSS channel and the Integrated Service Car have accelerated the agricultural licensing process (an average of 5 working days) and made it easier for 58% of farmers to take care of planting recommendation permits and land legality. Legal certainty has increased (68% of farmers feel protected) thus encouraging improvements in irrigation and tertiary conservation. The Pandan Wangi rice field zone is designated as a "Sustainable Food Agriculture Area" with a pre-verification mechanism for non-agricultural pre-permits (75% of applications are verified) and the implementation of a buffer zone of at least 50 m. Spatial planning enforcement was seen in 6 cases of minor conversion of functions, of which 4 cases were successfully acted upon through the revocation of permits and administrative fines. With improved zoning transparency, increased frequency of field services, and cross-OPD pre-permit verification, local government service functions will be more effective in supporting the sustainable preservation of Pandan Wangi rice land.

Marketing and diversification services of Pandan Wangi rice products

Comprehensive marketing services including market access facilitation, branding, promotion, and logistics services open opportunities for Pandan Wangi farmers to get added value. Meanwhile, product diversification, both in the form of ready-to-eat processed foods and non-food products based on rice waste, is a crucial strategy to expand market share, increase farmers' incomes, and realize local economic resilience. Synergy between the government, universities, and the private sector will strengthen the marketing and diversification ecosystem, so that the advantages of Pandan Wangi varieties can be optimally raised. The results of the interview regarding marketing services and diversification of Pandan Wangi rice products as a function of local government services in the preservation of Pandan Wangi Rice agricultural land in Cianjur Regency are described as follows:

The results of the author's interview with the Head of the Cianjur Regency Agriculture Office as informant 1 stated that: In order to support the preservation of Pandan Wangi rice land, the Cianjur Regency Government through the Agriculture Office considers it necessary to strengthen the service function in the aspect of marketing and product diversification. This aims to increase the added value of crop yields, stabilize prices, and encourage farmers to maintain the sustainability of rice fields. Some of his response points are as follows:

- a. Integrated marketing center: Establishment of the "Pandan Wangi Rice Marketing Center" in Cugenang, which houses harvested dry grain (GKP) and connects farmers with off-takers (bulog, PB Padi cooperatives, local entrepreneurs).
- b. Digital platform: Development of the "PandanWangi Mart" application to bring together farmers with modern markets (retail, e-commerce) and end-users, complete with order, digital payment, and rice taxi logistics features.

- c. Corporate partnership: Facilitation of a memorandum of understanding (MoU) between farmer groups and premium rice mills, ensuring the purchase of grain at a stable price above the HPP.

With structured and integrated product marketing and diversification services, it is hoped that Pandan Wangi farmers will be more motivated to maintain the sustainability of their rice fields, while obtaining sustainable economic welfare.

Agricultural infrastructure and technology facilities

The Regional Regulation of the Regional Spatial Plan (RTRW) of Cianjur Regency 2024-2044 places the "typical rice cultivation area" as a perennial agricultural zone that must be maintained through the support of irrigation networks, farming roads (JUT), and integrated post-harvest infrastructure. This provision is a legal umbrella for all infrastructure and technological interventions on Pandan Wangi land. Through the public service function, the Cianjur Regional Government synergizes hard infrastructure (irrigation, JUT, warehouses) and smart technology (alsintan, IoT, seed lab) to maintain and increase the productivity of Pandan Wangi land. This approach not only maintains the unique character of aromatic rice, but also retains the rate of land conversion, strengthens farmers' economies, and adds value to local cultural tourism. This kind of service model can be replicated in other local variety centers with local agro-ecological and socio-cultural adjustments.

Law Enforcement Functions

The law enforcement function is a series of government efforts to ensure compliance with laws and regulations through the detection of violations, enforcement of sanctions, and restoration of legal conditions. In the context of the conservation of Pandan Wangi rice fields, this function aims to prevent and take action against land transfer, land degradation, and permit violations.

Implementation of sanctions against violations of land conversion

Law 41/2009 on the Protection of Sustainable Food Agricultural Land (PLP2B) Articles 72-74 threatens the perpetrators of the transfer of LP2B functions with imprisonment of up to 5 years and a fine of up to Rp 1 billion as well as the obligation to restore the land function. Cianjur Regency Regulation 4/2019, as amended by Regional Regulation 4/2024, concerning LP2B stipulates 22 "eternal zones" villages including the Pandan Wangi cluster; Violations are rewarded:

- a. Written reprimands \leq 3 times.
- b. Administrative fines of IDR 25-100 million/ha.
- c. Revocation of building/housing permits and land restoration orders within 90 days.

Regional Regulation 19/2012 on the Preservation and Protection of Pandan Wangi Rice prohibits the conversion of land of superior varieties; farmers/corporations who violate can be sanctioned additionally in the form of cancellation of the right to the Pandan Wangi Geographical Indication. The application of sanctions on land conversion in Cianjur is designed as a protective public service, not just a coercive action. Through a strong legal framework (Law 41/2009, LP2B Regional Regulation, and Pandan Wangi Regional Regulation), digital detection procedures, mediation, and administrative-criminal enforcement, the Regency

Government seeks to maintain the identity of Pandan Wangi while protecting the welfare of farmers. The success of this mechanism depends on a combination of spatial data transparency, free legal assistance, and consistent firm enforcement to restore rice field ecology so that Cianjur's fragrant varieties remain sustainable for future generations.

Based on the results of observations regarding the involvement of stakeholders in policy formulation as a function of policy formulation of the role of local governments in the preservation of Pandan Wangi rice farmland in Cianjur Regency:

- a. Geoportal-LP2B updates Sentinel-2 imagery every 15 days; 100% of Pandan Wangi rice fields have been set for coordinates. 6 drone outings/year; 18 NDVI anomalies > 0.25 ha 2024 were all verified (14 real violations, 4 annual vegetation errors).
- b. Red-flag algorithm is active; The average "Reject Location" response was 2.4 business days. 31 PBG/PKKPR applications were rejected (2023 – April 2025).
- c. The Spartans have a 8/8 round schedule; Average verification Minutes issuance time = 5.6 days (target ≤ 7 days). 42 citizen reports were verified; 14 lands are sealed; 5 criminal cases were filed.
- d. 100% SP-1 \rightarrow SP-3 documents, seals, & court judgments uploaded (LP2B Compliance Dashboard). Public access level 12 778 visits /2024; Farmers can download ShapeFile.
- e. The Siaga Sawah application received 68 valid complaints; 83% were acted upon ≤ 30 days. The Srikandi Farmers Group and APPW are trained by mini UAV; 9 drone footage was sent by residents.

Based on the description of supervision over the implementation of local regulations as a law enforcement function, the role of local governments in the preservation of Pandan Wangi rice farmland in Cianjur Regency, it can be concluded that the supervision architecture of the LP2B Regional Regulation and the Preservation of Pandan Wangi in Cianjur has shifted from reactive to proactive, marked by spatial data unification, automatic permit screening, integrated patrols, and community involvement. The results are real: the conversion rate of aromatic rice fields has dropped by almost half in three years, while transparency has increased sharply. However, this success is still fragile if the split-plot gap and tracing of beneficial owners is not immediately closed, and the capacity of village human resources is not strengthened. By following up on the recommendations above, the Cianjur Regency Government has the opportunity to make the supervision of LP2B Pandan Wangi a national model for the protection of local varieties based on participatory and technology-based law enforcement.

Land dispute resolution

Land dispute resolution as a function of law enforcement in the preservation of Pandan Wangi Cianjur rice fields, the role of local governments:

- a. The mediation and consultation facilitator, the Agriculture Office together with the Land Office (BPN) initiated the initial mediation by involving the parties (owners, fishermen, heirs) and community leaders, to find a win-win solution before proceeding to court.
- b. Strengthening and registration of mapping, Supporting a complete systemic land registration program in Pandan Wangi villages; allocate the budget for the creation of Land Parcel Maps (PBT) and Consolidated Parcel Maps (PBC) so that the status of land is accurately verified.

- c. With the establishment of a dispute resolution team, the district formed a Special Team for Land Dispute Resolution across OPDs (BPN, Agriculture Office, DPMPTSP, Satpol PP), which is equipped with technical authority for field verification and policy recommendations.

Factors Inhibiting the Government's Role in Preserving Pandan Wangi Rice Agricultural Land in Cianjur Regency

Pandanwangi Cianjur rice is a leading local rice variety that has obtained Geographical Indication recognition, and can only be grown in seven sub-districts in Cianjur Regency. This rice is famous for its distinctive pandan aroma, fluffy rice texture, and its selling price which is classified as premium in the market. Pandanwangi rice fields are not only production land, but also hold deep historical and cultural values for the local community. Unfortunately, since the early 2000s, the area of Pandanwangi planting area has continued to experience a major decline due to the conversion of rice fields into residential, tourism, or non-agricultural infrastructure. The modernization trend erodes traditional landscapes, threatens the sustainability of Pandanwangi cultivation and can damage Cianjur's status as a typical regional rice barn.

Efforts to preserve Pandanwangi agricultural land have been responded to with various policies and programs, including Regional Regulations, the formation of farmer organizations, to the development of the Pandanwangi Rice Cultural Village as an educational tourism area. The following are discussed in depth the five main aspects that are obstacles: (1) Regulations and policies, (2) Institutions and coordination, (3) Social and cultural communities, (4) Economic aspects of farmers, and (5) Environmental conditions and supporting infrastructure.

Regulations and Policies

Formal efforts to preserve Pandanwangi in Cianjur have begun with a regulatory framework. The Cianjur Regency Government issued Regional Regulation No. 19 of 2012 concerning the Preservation and Protection of Pandanwangi Cianjur Rice, which aims to ensure the availability of special land for this local variety. The Regional Regulation is in line with the national mandate for Sustainable Food Agricultural Land Protection (LP2B) in accordance with Law No. 41/2009. On paper, this regulation stipulates that Pandanwangi rice fields are protected from conversion and ensure the sustainability of production. However, its implementation faces serious obstacles. Research in 2017 showed that the LP2B policy in Cianjur "has not been implemented" in real terms at the district level. This can be seen from the fact that there are still farmers who are willing to sell their land even though there are already protection rules. The enforcement of Regional Regulation 19/2012 is also considered weak: the existing legal rules and the right to Geographical Indications have "not been felt" in the field.

Another regulatory obstacle is the inconsistency of spatial planning policies. In the same period as the issuance of the Pandanwangi Regional Regulation, the Cianjur Regency Government established the 2011-2031 Regional Spatial Plan which actually allowed industrial zones in several agricultural areas. For example, Sukaluyu District (Sukasirna Village) was regulated as an industrial area through Regional Regulation No. 17 of 2012, so that there was a massive conversion of rice fields in the area. Within a decade, the proportion of agricultural

land in Sukasirna Village declined from 81% (in 2006) to only 66% (in 2016) because it was converted into industrial land. This case reflects a policy conflict: on the one hand there are regulations for food land conservation, but on the other hand economic development policies open a gap for agricultural land conversion. The absence of effective sanctions and weak supervision make the rules prohibiting the conversion of rice fields often ignored. National figures even urged the Cianjur Regency Government to tighten supervision of the conversion of agricultural land which is "increasingly widespread" into residential buildings, shophouses, and factories. In fact, Pandanwangi's rice land continues to shrink due to the expansion of the property. Thus, even though the legal tools already exist, the regulatory aspect becomes an obstacle when the implementation in the field is inconsistent and less firm.

On the positive side, local governments have begun to make policy adjustments to overcome previous limitations. In 2023, the Cianjur DPRD drafted a Raperda for the Preservation of Pandanwangi Superior Rice Varieties as a regulatory update (replacing the 2012 Regional Regulation) to strengthen the legal basis for preservation. The Regency Government also took concrete steps through the land acquisition program. Around 10 hectares of land in Warungkondang have been purchased by the government in 2017-2019, of which 7 ha are allocated as Pandanwangi perennial rice fields and the remaining 3 ha are used as educational tourism destinations for the Pandanwangi Cultural Village. This program shows the good faith of the local government in increasing the area of protected land even though the scale is still limited. Overall, regulatory factors are an obstacle if they are not accompanied by strong cross-policy supervision and coordination. Pandanwangi land conservation requires synchronization between land protection rules and spatial planning policies, as well as enforcement commitments at the local level.

Institutional and Inter-Agency Coordination

In addition to regulations, institutional factors and coordination between government agencies play a major role in the effectiveness of land conservation. In Cianjur, there are various parties involved: the Agriculture, Plantations, Food, and Horticulture Office as the leading sector, the Agricultural Extension Center (BPP) in the sub-district, Bappeda in regional planning, and non-governmental organizations such as the Pandanwangi Cianjur Rice Preservation Society (MP3C). Ideally, this synergy between actors can ensure that the preservation program runs integrated. However, findings in the field show that coordination is not optimal. A study on the coordination of the Agriculture Office and BPP revealed that "there has not been a strong synchronization" in the preservation of Pandanwangi varieties. Both tend to carry out their respective tasks and programs separately without any structured joint activities. As a result, supervision of conservation efforts has not been carried out properly. A few years after the 2012 Regional Regulation came into effect, the enforcement of rules to prevent the conversion of Pandanwangi land is still "weak" and there is hardly a routine inspection mechanism at the field level.

The institutional role of farmers through MP3C is also important in preservation. MP3C as a Pandanwangi farmers' association seeks to "control, supervise and nurture farmers" members in implementing Pandanwangi cultivation in accordance with standards. The existence of MP3C is recognized as very important by stakeholders, especially in terms of technical assistance and maintaining the purity of the variety. The level of stakeholder

satisfaction with MP3C performance is also quite good (CSI score ~69.93%). However, MP3C does not have the legal authority to prohibit land sales or crack down on violations, so its function is more of an education and facilitation aspect. MP3C needs the support of government agencies for structural matters such as GI rule enforcement and land protection.

The lack of an integrated coordination forum between agencies is an obstacle in responding to cross-sector issues. For example, when there is a case of illegal land transfer, it is necessary to cooperate with the Agriculture Service (land data), Satpol PP (regional regulation enforcement), Spatial Planning Office (transfer of function permits), and village governments. If coordination is weak, handling becomes slow or authority is thrown at each other. Until 2021, the legal review noted that efforts to prevent the transfer of Pandanwangi land use "have not been well realized" even though the legal umbrella already exists, indicating a gap in coordination and supervision at the executive level. In addition, program synchronization between the local and central governments is also crucial. For example, the Ministry of Agriculture encourages a program to increase national rice production, but the Pandanwangi variety is not included in the national superior rice category so there is less seed support/subsidies. Without coordination, central policies can be counterproductive to local efforts to preserve special varieties.

Institutional strengthening and inter-agency coordination forums are urgent needs. The local government needs to form a special cross-agency team or task force to monitor Pandanwangi land, involving MP3C, academics, and law enforcement. Integration (integration is one of the principles of Regional Regulation 19/2012) mandated by regulations must be realized so that preservation efforts do not run partially. Without solid coordination, preservation programs are vulnerable to being hampered by sectoral egos and information gaps between institutions.

Socio-Cultural Community

The socio-cultural aspects of the agricultural community also affect the success of Pandanwangi land conservation. Culturally, Pandanwangi rice is a local pride of Cianjur which has been a regional icon for decades. In the past, many farmers proudly planted this variety because of its special value. However, social changes in the countryside and shifts in farming culture have reduced the interest of the current generation in Pandanwangi. Modernization and the development of agricultural technology have made people switch to more practical farming methods and varieties that are easier to manage. The Pandanwangi Cultural Village officer noted that "the surrounding community has begun to rarely plant Pandanwangi rice" as the times develop. Traditional farming values are beginning to erode among the youth; Many farmer children choose to work in the non-agricultural sector rather than continue the family rice field. In Cianjur, rural industrialization (as in the case of Sukasirna Village) caused the number of farmers to decline sharply and switch professions to factory workers. The urbanization trend also makes inherited land sold when the older generation retires, because the heirs are not interested in managing the rice fields.

In terms of cultivation preferences, modern rice varieties are more in demand by some farmers because they are considered profitable quickly. The national superior varieties (IR-64, Ciherang, etc.) have shorter planting cycles and high productivity, so it is tempting for farmers to leave the relatively fussy Pandanwangi. Even the central government in the 1970-1990s era

aggressively encouraged the Green Revolution with superior seeds, making the expansion of Pandanwangi "hampered, and even continued to decrease from 2000" because it lost competition with national varieties. Technically, Pandanwangi requires specific conditions (plateau ~700 meters above sea level, certain climates) and a longer planting period (145-155 days) so that it can only be harvested 2 times a year, different from other varieties that can be harvested 3 times. As a result, many young farmers consider Pandanwangi to be less efficient in terms of time and energy. The culture of mutual cooperation and patience in traditional farming has decreased, replaced by an orientation of instant results.

On the other hand, the general public's awareness of the importance of preserving local varieties still needs to be increased. Urban consumers may care less about where rice comes from as long as the price is affordable. Market demand that is not directly visible also affects the psychology of farmers. If the local community does not show appreciation (for example, through premium prices or buy local programs), farmers feel that it is useless to plant more difficult Pandanwangi. Fortunately, there are cultural initiatives such as rice festivals, educational tours, and historical stories held at the Pandanwangi Cultural Village to regrow collective pride. This tour educates visitors about the history and process of planting Pandanwangi, it is hoped that it can motivate the surrounding community to return to planting.

However, a change in mindset takes time. Currently, the shift in farmers' interest in crops that are more economically profitable is still the main factor in the decline in Pandanwangi's planting area. This variety is often perceived as less profitable when viewed solely from the volume of yields, so it takes effort to convince farmers that the added value (high price, cultural heritage) is worth their hard work. As long as the evolving social norm is the pursuit of short-term gains, land conservation programs will be hampered. Therefore, socio-cultural aspects need to be touched with counseling that arouses local pride and explains the long-term benefits of maintaining regional varieties. The key to success lies in changing behavior: making planting Pandanwangi again a practice of high social value in the Cianjur farming community.

Economic Aspects of Farmers

Economic factors are the main drivers of farmers' decisions in maintaining or diverting their land. Many farmers face a dilemma between the short-term gains from selling land versus the long-term gains from farming. Not infrequently, the offer of land prices for housing or industry is very tempting compared to the net profit of working on rice fields for many years. Research shows that there are still Pandanwangi farmers who choose to sell their land despite the protection program, due to urgent economic needs or the lure of big money. In microeconomics, this is rational if the selling price of land is able to cover the loss of farmer income for decades. The conversion of land into industry in eastern Cianjur, for example, has increased community income by around 41% with many residents turning into factory employees. A monthly steady income as a factory worker or trading around an industrial estate is considered more promising than a fluctuating income from farming. So, without competitive financial incentives, it is difficult to prevent farmers from releasing their land.

In addition, the advantages of Pandanwangi cultivation itself must be quite attractive. Although the price of Pandanwangi rice in the market can reach 2-4 times that of ordinary rice, farmers do not always enjoy large margins. Pandanwangi's production costs tend to be higher: special seeds are needed, careful fertilization, longer planting periods (extra labor costs), and

the risk of crop failure is greater if environmental conditions are not optimal. If the market mechanism is unfair, farmers are oppressed. The rice trade chain is often dominated by middlemen who take high profits, so the farm gate price of grain is low. MPR Chairman Zulkifli Hasan once highlighted that in Cianjur "farmers change their land a lot" because they are trapped by middlemen who suppress crop prices to "unrealistic in the market". This condition destroys the enthusiasm of farmers to plant local rice; They feel that their hard work is not worth the profits enjoyed by the intermediary. Therefore, the failure of the Pandanwangi rice marketing chain is also an inhibiting factor. If Pandanwangi products are not marketed properly and stably, farmers tend to switch to other commodities or exit the agricultural sector altogether.

Other economic factors are limited capital and access to technology. Many Pandanwangi farmers are small farmers with mediocre capital. To maintain the land, sometimes they need investment (e.g. repairing irrigation, buying tillage machinery, etc.). Without credit or subsidy support, their financial capabilities are weak and their land is prone to being sold when they need money. The farmer empowerment program in Cianjur still needs to be improved in effectiveness. For example, the Regency Government already has Regional Regulation No. 9 of 2023 concerning Farmer Protection and Empowerment, which should provide capital assistance, agricultural insurance, or price stabilization. If the implementation is minimal, farmers do not feel real benefits. Currently, the price of Pandanwangi grain can fluctuate depending on the harvest and niche market demand. Without a decent price guarantee or buy-back scheme, farmers face the risk of loss. The economic condition of vulnerable farmer households (income below the UMR, not fixed) makes them risk-averse to crops that are considered less certain.

In short, the economic aspect becomes an obstacle when the benefits of keeping agricultural land feel smaller than letting it go. Pandanwangi land conservation must be accompanied by improving the welfare of farmers: through price incentives (e.g. premium prices for Pandanwangi's original rice), cutting middlemen chains with direct market access, business diversification (agro-tourism, Pandanwangi derivative products), and input subsidy assistance. Without these microeconomic improvements, farmers tend to pragmatically choose options that are more financially profitable in the short term, even if it means sacrificing productive farmland.

Environmental Conditions and Supporting Infrastructure

The condition of the natural environment and agricultural infrastructure in Cianjur also determines the success of Pandanwangi land conservation. The Pandanwangi variety is strongly influenced by specific agroecological factors: it requires an altitude of about 700 meters above sea level with a cool climate and adequate water supply. Environmental changes such as global climate change are becoming new challenges. Farmers complain of erratic seasons, changing rainfall patterns, and an increasing frequency of extreme weather. Climate change has been cited as one of the factors in the decline of Pandanwangi cultivation recently. For example, the 2023 El Niño weather anomaly is feared to trigger a drought that threatens Pandanwangi production, so this topic has even become a topic of discussion for Commission IV of the House of Representatives to Cianjur. The resistance of local varieties to climatic stresses may be lower than those of superior varieties that have been engineered, so it is

necessary to adapt planting techniques (planting timing, pest-resistant varieties, etc.). Otherwise, farmers face a greater risk of crop failure on Pandanwangi land, which certainly hinders the motivation to defend the land.

In terms of pests and diseases, local varieties such as Pandanwangi can be vulnerable to certain attacks. For example, the golden snail pest is reported to be a problem in the Pandanwangi Cianjur rice fields. Without adequate pest control infrastructure (intensive counseling, access to environmentally friendly pesticides), pest attacks can reduce productivity and discourage farmers from replanting. This is also related to institutional support: the role of BPP and POPT (Plant Pests Organism Control) must be optimized in the Pandanwangi area.

The supporting infrastructure aspect mainly concerns irrigation. Agricultural land will be difficult to sustain if there is not enough water. Cianjur is actually known to have many technical irrigation networks (e.g. Cihea Irrigation in the north), but the distribution of functions is still lacking. The West Java DPRD found that many irrigation canals in Cianjur were "not functioning properly", making it difficult for farmers to increase production because most rice fields only rely on rainfall. Even in Ciherang Village, Karangtengah District – whose land is partly rainfed – the irrigation that has been repaired is still not optimal to irrigate rice fields. This lack of irrigation infrastructure means that Pandanwangi farmers are very dependent on the rainy season; In the dry season, many lands are forced to be planted (not planted) due to lack of water. These limitations clearly hinder conservation efforts, because land that should be productive can be abandoned and vulnerable to conversion if it is often not cultivated.

Another environmental factor is natural disasters. Cianjur Regency is prone to earthquakes and landslides, as evidenced by a major earthquake in 2022 (the center in Cugenang) and a hydrometeorological disaster at the end of 2024 in the south of Cianjur. This disaster damaged much agricultural infrastructure. The Cianjur PUTR Office reported that dozens of irrigation networks were closed by landslides after extreme rains in December 2024, causing water supply to rice fields to be stalled in 17 sub-districts. The irrigation damage has an impact on thousands of hectares of rice fields that are threatened with drought and fail to plant, requiring time and large costs for repairs (losses are estimated at >Rp5 billion). Although the Pandanwangi area is concentrated in north-central Cianjur, the damage to irrigation facilities everywhere reduces the overall food production capacity of the region. If production decreases, the pressure on housing development could increase under the pretext of idle land. Therefore, physical infrastructure (dams, primary-secondary channels, farming roads) needs to be maintained so that agricultural land remains productive and not "considered redundant".

Finally, supporting infrastructure support such as road access and markets also has an effect. If the location of the Pandanwangi rice fields is remote and transportation access is difficult, it is difficult to bring the crops to the market quickly. Remote farmers may prefer to sell their land if the infrastructure does not improve. Similarly, the availability of adequate warehouses/barns (leuit) will help farmers store Pandanwangi grain so that it is not sold in a hurry when prices are low. Traditionally, the Sundanese people have a leuit culture for rice reserves, and in the Pandanwangi Cultural Village this is reintroduced. Strengthening this storage facility is important for the economic resilience of farmers as well as part of social infrastructure.

Overall, environmental conditions and infrastructure that are less supportive will be serious inhibiting factors. The increasingly unpredictable climate, the threat of disasters, pests, and damaged irrigation infrastructure have reduced the productivity of Pandanwangi's land. In fact, in order for the land to be sustainable, farmers must feel optimal results. Local governments need to prioritize irrigation improvements – as called for by the West Java DPRD through the mutual cooperation of the central government, provinces, regions, and farmer groups.

In addition, the adoption of adaptive technologies (e.g., Pandanwangi varieties that are more resistant to selection, or planting systems that are conservative to climate change) must be intensified through counseling. Without conducive environmental support, farmers will find it increasingly difficult to defend their land from the target of the non-agricultural sector.

Efforts Made to Overcome Obstacles to the Government's Role in Preserving Pandan Wangi Rice Agricultural Land in Cianjur Regency

The Cianjur Regency Government has issued Regional Regulation No. 19 of 2012 concerning the Preservation and Protection of Pandanwangi Rice. This Regional Regulation emphasizes the purpose of preserving the quality and existence of the Pandanwangi variety as a local heritage. However, a number of studies show that the implementation of the Regional Regulation has not been optimal. Various obstacles ranging from land conversion to the risk of crop failure encourage the government and local communities to take various countermeasures.

Regulations and Policies

As a legal basis, Regional Regulation No. 19/2012 is the main reference in protecting Pandanwangi Rice. This Regional Regulation regulates the development and control of Pandanwangi varieties so that their quality and existence are maintained. In addition, the Cianjur Regency Government issued Regional Regulation No. 4/2019 concerning Sustainable Food Agricultural Land Protection (P4), which also applies generally to all strategic agricultural lands. In the 2011–2031 Regional Spatial Plan (RTRW) document, Pandanwangi is listed as a "strategic area" that receives priority for special rice land development. For example, there is a plan to develop Pandanwangi agricultural land areas in several sub-districts (Cianjur, Cilaku, Cibeber, Warungkondang, Gekbrong) which is funded by the State Budget and Regional Budget. With this regulation, the government is trying to hinder the conversion of productive land functions. However, academic studies state that the implementation of Regional Regulation 19/2012 and land protection provisions have not been fully realized in the field.

Budget and Financing

Pandanwangi's conservation efforts are supported by funding from various sources. Based on the Cianjur RTRW, Pandanwangi land development will use the State Budget and the APBD (APBD I/APBD II) as a source of financing. The local government also allocates APBD funds for superior agricultural programs, including the development of Pandanwangi farmer groups. For example, agricultural agencies and related agencies collaborate with campuses or research institutions, some of which are sourced from regional funding schemes or partnerships. In addition, central incentive programs such as Rice Farming Insurance

(AUTP) are run to protect farmers from the risk of crop failure. However, the participation of Pandanwangi farmers in AUTP is relatively low in West Java, so the effectiveness of this program has not been maximized.

Institutional

The preservation of Pandanwangi involves several government organizations. The Cianjur Regency Agriculture, Food Crops and Horticulture Office is the spearhead in the field of technical coaching and counseling. Meanwhile, the Tourism and Culture Office plays a role in developing the Pandanwangi Rice Cultural Village as an educational tourist attraction. The Regent of Cianjur even led a cross-OPD team (regional apparatus organization) to 'gotong royong' in the arrangement of the cultural village. The RTRW and RZWP3K Regional Regulations mandate the arrangement of agricultural zoning, so that the institutional spatial planning is integrated. For coordination, the Regency Government also appoints a special team and collaborates with research institutions (e.g. Bappeda with agricultural research institutions) in order to bridge policies with field needs. In terms of community institutions, the Government also established the Pandanwangi Cianjur Rice Preservation Society (MP3C) as a collective forum for farmers and experts 'formed by the government' to preserve Pandanwangi.

Community initiatives

MP3C is a community institution consisting of Pandanwangi farmers, academics, and other stakeholders. Based on the statement of the Chairman of MP3C, Ahmad Nur Rizal, this organization routinely collaborates with experts and higher education institutions (for example, the Faculty of Applied Sciences, Suryakencana University) for research and education related to Pandanwangi. MP3C often holds technical assessments (nutrients, fertilizers) and the development of superior seeds with GAPOKTAN. The existence of MP3C is expected to be a bridge between farmers and regional policies. Although formed by the government, MP3C plays a role as an agent for preserving local wisdom. For example, on Cianjur's 346th Anniversary, MP3C encourages the government to be more sensitive to Pandanwangi's wisdom and realize budget support for its preservation.

Pandanwangi Padi Cultural Village

As an effort to preserve the cultural aspect of agriculture, the Cianjur Regency Government built the "Pandanwangi Rice Cultural Village" in Tegallega, Warungkondang District. This program involves the Tourism Office and other OPDs to arrange villages with a traditional village atmosphere, starting from traditional houses to the traditional process of planting and processing Pandanwangi rice. The goal is to package Pandanwangi as an educational tourism object that attracts domestic and foreign tourists. The government targets the improvement of this area to be completed in early 2025. The realization of the physical development of the cultural village has begun in 2024, with four main location points fixed by the Tourism Office using APBD funds. This program also absorbs local workers so that it has an economic impact on villagers. However, there are technical obstacles, such as the rainy season (pancaroba) that slows down construction.

Cross-institutional collaboration

The preservation of Pandanwangi also involves institutional partnerships. The district government collaborates with national research institutes (BRIN) and universities (Suryakencana University) for seed breeding research and planting technology development. For example, BPTP West Java and the Agricultural Research and Development Agency (now BRIN) conducted field visits to the Pandanwangi location for technical recommendations. The central government through Commission IV of the House of Representatives of the Republic of Indonesia also voiced the urgency of protecting Pandanwangi so that it would not be hindered by the theft of varieties abroad. At the village level, labor-intensive programs or village funds are sometimes diverted to agricultural infrastructure (irrigation or farm roads) in the Pandanwangi area. In addition, the local scientific community holds educational activities through the "Choose Pandanwangi" competition or local culinary festival to increase added value (e.g. Geographical Indication licenses) as well as agricultural tourism. For more details, efforts to preserve Pandan Wangi rice land in Cianjur Regency are described as follows:



Figure 2. Efforts to Preserve Pandan Wangi Rice Land in Cianjur Regency

Source: Research results processed, 2025

Based on the figure, it shows six main pillars in the Padi Pandanwangi Cianjur land conservation strategy:

- 1) Regulations and Policies: The Regional Regulation affirms the legal umbrella (Regional Regulation No. 19/2012 and Regional Regulation LP2B) which prohibits the transfer of the function of Pandanwangi rice fields and requires the protection of local varieties.
- 2) Budget Allocation: the commitment of the APBD/APBN to fund conservation programs ranging from land acquisition to subsidies for agricultural inputs.
- 3) Incentives for the community are the provision of Land Tax and Building Land Relief for Padi Pandan Wangi Cianjur.
- 4) Community Initiatives: the active role of farmer groups (MP3C), NGOs, and villagers in providing policy input, monitoring implementation, and carrying out conservation activities in a cooperative manner.
- 5) Demo Plot: a special plot of Pandanwangi varieties for testing planting techniques, direct counseling, and observation of cultivation success which is then replicated to other farmers.

- 6) Improved Irrigation Facilities: waterways emphasize the importance of improving and improving irrigation networks from dams to tertiary channels so that water supply is stable and rice fields are avoided from famine.
- 7) Institutional Coordination: synergy across OPDs (Bappeda, Agriculture Office, Spatial Planning Office, Satpol PP) as well as collaboration with universities and BRIN to ensure integrated policies, funding, and supervision.

The combination of government policies and community movements shows progress, but its effectiveness still needs to be improved. Regulations such as Regional Regulation 19/2012 and the LPPB Regional Regulation provide a strong legal umbrella to protect Pandanwangi, but without strict supervision and real incentives, they have little impact. Funding for the Pandanwangi initiative is relatively small compared to the needs of land conservation and variety research. New institutions such as MP3C and cultural villages help create awareness and collaboration, but have not been able to double the area of planting. In several spatial plans, Pandanwangi has been prioritized, but rice fields are still eroded if critical land is neglected. Although insurance programs (AUTP) and technical assistance are provided, low knowledge of farmers and bureaucracy create a gap between policymakers and farmers on the ground. Therefore, the effectiveness of Pandanwangi conservation is highly dependent on the combination of sufficient funding, institutional strengthening (including field supervision), and active community participation.

Within the strategic framework, measures to expand cultural villages and promote tourism have proven to be effective in raising public awareness, but must be complemented by direct support to farmers (technical coaching and price guarantees). Local studies encourage local governments to increase socialization and funding through the APBD, as well as clarify the technical standards for Pandanwangi planting guidelines. The relationship between spatial planning policies, land protection, and the recognition of Geographical Indications must also continue to be strengthened so that Pandanwangi can survive as Cianjur's agricultural identity.

CONCLUSION

Based on the findings, the Cianjur Regency Government implemented strategies to preserve *Pandanwangi* rice land through regulations (Perda No. 19/2012 and Spatial Regulation No. 4/2019), fiscal incentives, spatial planning, stakeholder coordination, and Geographical Indication (GI) promotion. However, challenges persisted, including weak law enforcement, limited inter-agency coordination, socio-cultural shifts, economic pressures on farmers, environmental degradation, ongoing land conversion, and youth disinterest despite MP3C and cultural village initiatives. Recommendations include strengthening field supervision, aligning spatial plans with farmer economic incentives, expanding access to insurance/organic subsidies/GI-marketing, and encouraging youth engagement via education/agrotourism branding. Future research should evaluate the effectiveness of integrating *Pandanwangi* agrotourism with youth engagement programs to assess its impact on cultural preservation and economic sustainability.

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