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Assessing farmer's perceptions of Sunda leopard cats (*Prionailurus javanensis*) in rice fields area of West Sumatra, Indonesia

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Abstract. *Fakhri A, Rizaldi, Aadrean. 2024. Assessing farmer's perceptions of Sunda leopard cats (*Prionailurus javanensis*) in rice fields area of West Sumatra, Indonesia. Biodiversitas 25: 4397-4405.* Land use change in agricultural areas has caused wildlife to adapt to living in these areas, such as rice fields. Sunda leopard cats (*Prionailurus javanensis*) in rice fields have rice field rats as their main prey, which are pests. This cat is useful as a biocontrol of rat pests, but human activities threaten its presence. This study aims to determine farmers' perceptions of the importance of Sunda leopard cat's presence, its conservation and protection, and farmer participation in its conservation in rice fields of Nagari Batu Taba, Agam Regency, West Sumatra. In June 2023, we employed purposive sampling and conducted semi-structured interviews involving 27 farmers. A mixed-methods approach was used to analyze the data. The results of this study showed that farmers' perceptions were in the 'Good' category for the importance of the cat's presence (76.74%), for conservation and protection (78.08%), and for farmer participation in conservation efforts (93%) in rice fields of Nagari Batu Taba. Farmers recognize the important role of these cats in the rice field ecosystem as a biological pest control of rice field rats. However, human activities in human-dominated landscapes pose a threat to the survival of these cats. Coexisting in the same area has motivated farmers to undertake conservation efforts to protect cat presence in the rice fields. Therefore, effective conservation efforts involving farmers, researchers, government agencies, and non-governmental organizations are essential. However, the need for further research to develop conservation strategies and evaluate the conservation status of Sunda leopard cat is urgent and cannot be overstated.

Keywords: Coexistence, human-dominated landscape, wildlife conservation

INTRODUCTION

The increase in human population has led to an increase in human demand for food and has led to an increase in land use change to agriculture. These changes can damage the natural environment by threatening biodiversity and degrading soil quality (Hakim et al. 2020). Agricultural expansion can affect the adaptation and behavior of wildlife as they become habituated to living in artificial habitats such as rice fields (Lerman et al. 2021). Rice fields are artificial wetlands that represent about 15% of the world's wetlands today. Various studies have proven that rice fields serve as habitats for wildlife. Rice fields also provide ecosystem services similar to those of natural wetlands, such as water quality, local climate mitigation, flood control, and etc. (Toffoli and Rugheti 2020). One of the small wild cats that utilize rice fields as their habitat is Sunda leopard cat (*Prionailurus javanensis* Desmarest, 1816) (Husodo et al. 2022; Shanida et al. 2018, 2023).

As an apex predator, Sunda leopard cats utilize rice fields with high levels of human activity to prey on rice field rats (*Ratus* sp.) (Shanida et al. 2023), which are pests of rice fields (Parmin et al. 2023). Sunda leopard cats can utilize natural habitats with little visibility (<2 m), such as bushes, reeds, and rocks, as a place to rest or hide when hunting (van der Meer et al. 2023). Rice field rats are terrestrial rodents that are the main prey of this cat in various types of monoculture habitats such as production forests, sugar cane, oil palm, and rice fields (Fernandez and de Guia 2011; Lorica and Heaney 2013; Silmi et al. 2021; Shanida et al. 2023; Subrata and Permatasari 2023). This agricultural pest, as the main prey of Sunda leopard cats, shows potential as biological pest control (biocontrol) in agriculture (Silmi et al. 2013, 2021).

Since 2017, Sunda leopard cats have been designated as a separate species from Mainland leopard cats (*Prionailurus bengalensis*) based on genetic, evolutionary, and geographic studies (Kitchener et al. 2017; Patel et al. 2017). The International Union for Conservation of Nature's Red List of Threatened Species (The IUCN RedList) updated Mainland leopard cat's conservation status to "Least Concern" (Ghimirey et al. 2023), but there is still no conservation status for Sunda leopard cats. These cats are protected by Indonesian law from poaching and illegal trade. However, the presence of Sunda leopard cats in human-dominated landscapes makes them vulnerable to ongoing poaching and illegal trade (Nijman et al. 2019).

Wildlife in human-dominated landscapes plays an important role in maintaining ecosystem balance. Wildlife provides Ecosystem Services (ES) that benefit the surrounding community. For farmers, wildlife can control pest populations, help with pollination, or provide feces and carcasses as fertilizer (Gorosábel et al. 2020). Practically maintaining ecosystem balance for ES in rice fields can be done by practicing eco-friendly rice fields. Rice farmers have carried out this practice in Tungshiau Township, Miaoli Country, Taiwan, implementing

"Leopard Cat-Friendly Agricultural Product" and "Leopard Cat Rice". In Taiwan, most of Mainland Leopard Cat's habitat is located on private land or in human-dominated landscapes. The lack of government support for conservation efforts has driven the private sector, conservation scientists, and Non-Governmental Organizations (NGOs) to initiate a community-based conservation program. This program focuses on developing sustainable and environmentally friendly agricultural practice. It is supported by farmers who acknowledge the valuable ES provided by the presence of these cats and other wildlife (Hsu 2021).

Knowing farmers' perceptions of Sunda leopard cats in rice fields is needed to provide information on the current presence and conservation of these cats according to the knowledge and perceptions of rice farmers. This information is very useful to help develop conservation plans and determine the conservation status of these cats to make them more protected. Little is known about threats caused by human influence, which are very dangerous for these cat populations (Fakhri 2023). Until now, no research has been conducted to determine farmers' perceptions of Sunda leopard cats' presence in rice fields. Therefore, we have conducted a study to determine farmers' perceptions of the importance of Sunda leopard cat's presence, its conservation and protection, and farmer participation in its conservation in rice fields.

MATERIALS AND METHODS

Study area

The study was conducted in June 2023 in the rice fields area in Nagari (administrative division) Batu Taba, Agam Regency, West Sumatra Province, Indonesia (0° 19' 16.0" S 100° 24' 58.4" E). This village is in proximity to Bukittinggi City, one of the economic center of West Sumatra Province. Covering a total area of 376 ha, Nagari Batu Taba consists of croplands of 56.9 ha, rice fields of 118 ha, and others (settlements, roads, etc.) of 201.1 ha (Gusneli R 2023, pers. com.). Nagari Batu Taba is located at the foothills of Mount Marapi, with an altitude of 980 meters above sea level. Mount Marapi is an active volcano and has potential for fertile soil. The valley formed around Mount Marapi is surrounded by hills that are also part of Bukit Barisan Mountains formation. This area has been utilized by the community since long ago as an agricultural area and is dominated by rice fields.

This location was selected using purposive sampling based on a preliminary survey from local community information regarding the presence of sunda leopard cats in the rice fields of Nagari Batu Taba. Nagari Batu Taba has no protected forests and the community utilizes the entire area for settlement and agriculture. The closest protected forest is Mount Marapi Nature Park, which is about 4 km from Nagari Batu Taba (Figure 1). Rice fields around Mount Merapi use river flow from Mount Merapi and surrounding hills as a source of irrigation. Three creeks pass Nagari Batu Taba.

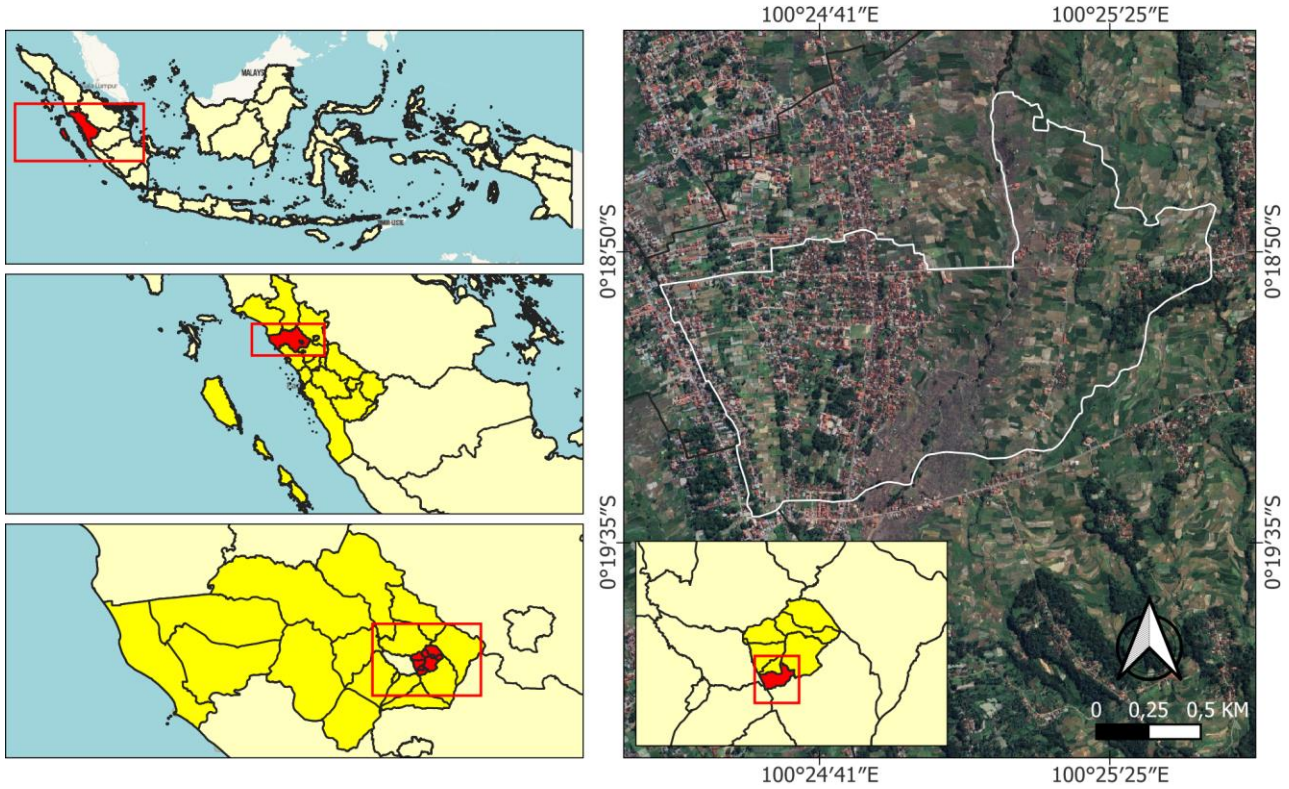

Figure 1. Location of Nagari Batu Taba with rice field areas as the study site

Procedures

We used purposive sampling method with the criteria of farmers who have been farming rice in Nagari Batu Taba for at least five years and aged between 20 to 65 years. These respondents were identified beforehand through their data before proceeding with the interviews. We interviewed 27 respondents (23 men, 4 women). Interviews were conducted in three of the six jorong (administrative divisions) in Nagari Batu Taba that have large rice paddy areas, namely Jorong Panca, Jorong Surau Gadang, and Jorong Cangkiang. We used a mixed methods research design with semi-structured interviews that included Likert scale questions and open-ended questions (Propper et al. 2020). The interviews were conducted face-to-face in the rice fields at research site. Both closed and open-ended questions were used to allow respondents to elaborate on their answers and convey their ideas and views (Hunter and Brehm 2003).

The respondents were given an introduction to the study and consciously provided their consent to be interviewed. Interview questions were designed to explore farmers' perceptions of the importance of Sunda leopard cat's presence (12 questions), its conservation and protection (8 questions), and farmer participation in its conservation in rice fields (9 questions). Interviews were conducted face-to-face using the local language, Minangkabau, and then translated into Bahasa Indonesia. The use of local language in the interview was done to avoid confusion among respondents regarding the questions posed by the interviewer so that the results obtained were aligned with the purpose of the interview. We have attached our interview questionnaire in the supplementary file.

Data analysis

The data analysis used in this study is mixed-methods to interpret the results measured quantitatively supported by results that emerge qualitatively (Creswell and Creswel 2018). We interpreted farmers' perceptions based on the collected data. Farmers' perceptions were analyzed based on data collected from Likert scale questions and open-ended questions; a-3-point Likert Scale: 3 (agreement), 2 (neutral), and 1 (disagreement). Each respondent answered questions based on this Likert Scale. The total score and percentage score for each respondent were calculated using the following formula:

$$\text{Percentage score} = \frac{\text{Total score}}{\text{Maximum number of scores}} \times 100\%$$

The percentage scores were interpreted into three categories: Good (66.67-100%), Medium (33.34-66.66%), and Bad (0-33.33%). Therefore, to determine the dominant perception among all respondents, the average percentage score was calculated from the average of the total percentage scores (27 respondents) and interpreted according to these categories. The answers to open-ended questions were described to support and provide additional context to the quantitative data obtained.

RESULTS AND DISCUSSION

Farmers' perceptions of the importance of Sunda leopard cat's presence in rice field ecosystems

Farmers' perceptions of the importance of Sunda leopard cat's presence in Nagari Batu Taba rice fields are categorized as 'Good'. By calculating the average of the total percentage scores, an average percentage score of 76.74% was obtained. This perception category was obtained because most respondents fell within the 'Good' category, with a total of 21 respondents (77.78%). The following are details of the number of respondents based on their perceptions, as shown in Table 1.

The farmers in this study showed a good understanding of the presence and importance of Sunda leopard cat in the rice field ecosystem. The results of this study show that 19 of 27 respondents agree that this cat is beneficial for farmers, and 21 of 27 respondents agree it does not harm them. Farmers believe that this cat is useful for controlling the population of rice field rats, which are the main pests of rice plants. This also supported by 21 of 27 respondents agree that this cat contributes to controlling agricultural pest populations. Rice field rats are the main prey of this cat in rice fields (Shanida et al. 2023) (Figure 2). Rice field rats can eat all parts of the rice plant and generally attack in the early generative phase, which is very detrimental to farmers (Siregar et al. 2020). Therefore, a decrease in the population of Sunda leopard cats in rice fields will be very detrimental to farmers. Sunda leopard cat has become a keystone species in agricultural areas because it can control prey populations on farms (Fernandez et al. 2018). Positive perceptions in the community are strongly influenced by Local Ecological Knowledge (LEK). Good ecological knowledge in communities tends to result in a deep understanding of the ecosystem (Cebrián-Piqueras et al. 2020). This knowledge tends to be possessed by communities that coexist with nature (Camino et al. 2020). People who have more knowledge about carnivores will have a positive attitude towards them. This also applies to other wildlife as a higher level of knowledge tends to result in a more positive attitude towards the presence of this wildlife (Gebo et al. 2022). Individuals who are knowledgeable about the ecology and status of these cats are those who have experience conserving these cats in their habitats (Best and Pei 2020).

Table 1. Farmers' perceptions of the importance of Sunda leopard cat's presence in the rice field ecosystem

Perception	Total (n)	Percentage (%)
Good	21	77.78
Medium	6	22.22
Bad	0	0
Total	27	100

It's important to note that Sunda leopard cat, besides being beneficial to farmers, does not disrupt their activities in the rice fields. All respondents (27 of 27) agreed that this cat does not interfere with farming activities. Living in human-dominated areas, these cats apply proactive strategies to reduce encounters with humans (van der Meer et al. 2023). A total of 13 of 27 respondents agreed that the presence of cats is influenced by the growth phase of rice. Farmers often see this cat in rice fields, especially in the generative phase of rice during the flowering phase. During this phase, many rice field rats appear (Siregar et al. 2020). Occasionally, they also see tracks left by these cats on the rice field soil (Figure 3). The presence of farmers and Sunda leopard cats in the same area indicates coexistence in this dynamic situation where humans and wildlife occupy the same landscape and adapt to time-sharing activities (Sulaksono et al. 2023).

The results showed that farmers realize that agricultural activities can threaten the presence of Sunda leopard cats in rice fields; nine of 27 respondents agreed that the use of agrochemicals could threaten the presence of this cat. Pesticide residues are one of the agrochemicals scattered in agricultural areas that can pose a significant ecological risk to these cats. The accumulation of pesticide residues in their bodies can threaten their health and reduce the quality of their habitat (Liao et al. 2019). In addition, 20 of 27 respondents agreed that domestic dogs (*Canis lupus familiaris*) present a threat to these cats in rice fields. Previous studies have shown that domestic dogs are responsible for the decline of small wild cat populations in human-dominated landscapes by preying on them (Chen et al. 2019; Izawa et al. 2009; Mugerwa et al. 2020; Silva-Rodriguez et al. 2007). Landscapes dominated by human activities pose direct and indirect anthropogenic mortality threats to the survival of small wild cats (Chen et al. 2023; van der Meer et al. 2023).

One solution to reduce dependence on agrochemicals is to implement organic farming. A total of 12 of 27 respondents agreed that organic farming can protect Sunda leopard cats in rice fields. Similarly, 12 of 27 respondents also agreed on the maintenance of shrubs on fallow land or irrigation margins as protection for this cat. Organic farming or environmentally friendly rice fields is a practice of managing rice fields that does not only focus on production but also focuses on efforts to preserve the environment and restore wildlife, environmental components, and humans. This practice is considered effective in restoring rice fields that have been degraded by the adverse impacts of conventional agriculture and revitalizing rural communities (Usio 2014). However, the application of eco-fields requires more effort, time, skills, and faces a greater risk of yield reduction compared to conventional agriculture. Appropriate procedures are needed to minimize these burdens for the practice to be implemented successfully (Tsuge et al. 2014).

Farmers' perceptions of conservation and protection of Sunda leopard cat in rice field ecosystems

Farmers' perceptions of the conservation and protection of Sunda leopard cat in Nagari Batu Taba rice fields are categorized as 'Good'. By calculating the average of the total percentage scores, an average percentage score of 78.08% was obtained. This perception category was obtained because most respondents fell within the 'Good' category, with a total of 20 respondents (74.07%). The following are details of the number of respondents based on their perceptions, as shown in Table 2.

Table 2. Farmers' perceptions of conservation and protection of Sunda leopard cat in rice field ecosystem

Perception	Total (n)	Percentage (%)
Good	20	74.07
Medium	7	25.93
Bad	0	0
Total	27	100

Figure 2. Sunda leopard cat carrying rice field rats among rice plants in Nagari Batu Taba (Photo Ahmad Fakhri and Kurnia Ilham)

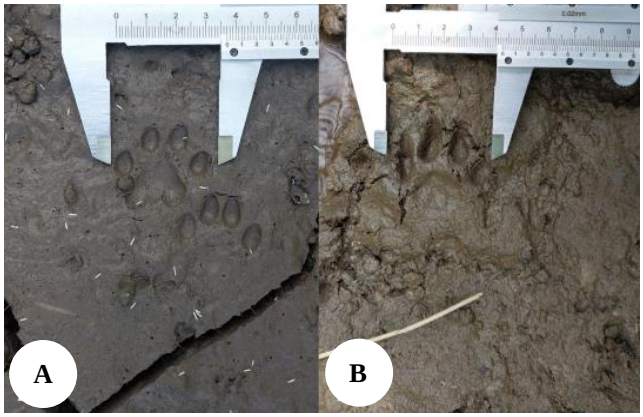

Figure 3. Presence sign of Sunda leopard cat in rice fields of Nagari Batu Taba. A. Left paw footprint; B. Right paw footprint (Fakhri 2023)

The farmers in this study showed high awareness of conservation efforts and protection of Sunda leopard cats in the rice field ecosystem. This can be seen from the positive attitude of farmers towards this cat. All respondents (27 of 27) agreed that they would not disturb and allow that cat to move when they saw it during their activities in the rice fields. In addition, 23 of 27 respondents agreed that farmers should coexist with this cat. Farmers' attitudes are directly part of their conservation behavior towards these cats. This positive attitude is likely influenced by positive experiences gained through interactions with nature and wildlife. Interest in wildlife arises when a person feels the benefits of interacting with nature. These positive experiences can encourage attitudes to protect nature and wildlife, although they do not always guarantee that a person will take action (Kansky and Knight 2014). A total of 14 of 27 respondents reported frequently encountering these cats more than once within a relatively close time frame while they were active in the rice fields. This indicates the high intensity of interaction between farmers and Sunda leopard cats in the study site. The benefit of this cat to farmers in controlling the population of rice field rats supports coexistence between them. Such ES are one of the keys to supporting effective conservation implementation through coexistence (Nguyen et al. 2024).

The coexistence between Sunda leopard cats and farmers is thought to be influenced by LEK that farmers have about this cat. Frequent interactions between them make farmers appreciate and feel the significant positive impact that these cats have on the rice field ecosystem. Farmers believe the role of cats as natural pest control for rice field rats has a positive impact on cats with no reported conflicts. By recognizing the ES provided by wildlife, the implementation of conservation will be stronger in the communities where these animals live. Therefore, the way and ability of communities to define the value of wildlife can determine the effectiveness of wildlife conservation implementation (Hsu 2021). The value of wildlife that aligns with the fulfillment of economic needs is an important factor in implementing conservation practices in areas dominated by humans, such as animal-friendly rice fields (Propper et al. 2020).

However, Sunda leopard cat's presence in agricultural areas such as rice fields is currently being threatened by human activities. The results showed that 11 of 27 respondents agreed that these cats are threatened in the farm environment, and nine of 27 respondents agreed that adverse activities from the area around the farm could cause the extinction of these cats. Most farmers recognized that being chased and hunted by domestic dogs was the most common threat to the cat. The presence of wild and uncontrolled domestic dogs, often moving freely in the farm environment, is considered a threat. Domestic dogs not only threaten wildlife but also destroy rice fields to hunt rice field rats or other wildlife by digging holes and collapsing rice field bunds to the detriment of farmers. Predation by domestic dogs can be a major cause of death for wildlife (Pereira et al. 2010). Nearly 200 vertebrate species are threatened with extinction worldwide due to domestic dogs. The development of human-dominated landscapes is thought to favor the spread of domestic dog impacts (Doherty et al. 2017). Domestic dog management practices need to be considered for long-term conservation success (Zorondo-Rodríguez et al. 2019). In addition, the threat of disease and parasites transmitted (feline leukemia and feline immunodeficiency virus) by domestic cats (*Felis catus*) is a risk to many small wild cat species in addition to predation by domestic dogs (Mugerwa et al. 2020).

Implementing conservation at the community level requires not only action but also compliance with law enforcement. Contributions from local communities can incur lower costs than through state apparatus (Ntuli et al. 2021). This statement is in line with the research results, where farmers' awareness of the need to comply with the regulations is good. The research results show that 23 of 27 respondents agreed that Sunda leopard cat is a wildlife that needs to be protected, 17 of 23 respondents agreed that there is a ban on hunting, and 13 of 27 respondents agreed that Sunda leopard cat should not be kept as a pet. Farmers feel that illegal hunting and keeping of this cat could reduce its population in the wild. However, the threat of hunting and trafficking continues, especially as these cats are more easily found in human-dominated landscapes than in forest areas. These cats are hunted and traded as pets in traditional markets or on social media, both as kittens and adults (Nijman et al. 2019); education and awareness are crucial to addressing Human-Wildlife Conflict (HWC). In addition, farmers' awareness to report to the authorities if they find an injured Sunda leopard cat is low. Approximately 11 of 27 respondents did not agree to report and chose to leave it alone, as they considered it as part of the natural process. This shows that education regarding conflict management is needed to develop adaptation strategies that can increase the adaptive capacity of local communities to support their adaptation to HWC (Nguyen et al. 2024).

Farmers' perceptions of farmer participation in the conservation of Sunda leopard cats in rice field ecosystems

Farmers' perceptions of the conservation and protection of Sunda leopard cat in Nagari Batu Taba rice fields are categorized as 'Good'. By calculating the average of the total percentage scores, an average percentage score of 93% was obtained. This perception category was obtained because most respondents fell within the 'Good' category, with 27 respondents (100%). The following are details of the number of respondents based on their perceptions, as shown in Table 3.

Table 3. Farmers' perceptions of farmer participation in conservation of Sunda leopard cat in rice field ecosystem.

Perception	Total (n)	Percentage (%)
Good	27	100
Medium	0	0
Bad	0	0
Total	27	100

The farmers in this study showed high participation in the conservation of Sunda leopard cat in the rice field ecosystem. The results showed that 22 of 27 respondents agreed that it was important for farmers and the surrounding community to actively participate in maintaining the existence of Sunda leopard cat in Nagari Batu Taba agricultural area. They feel that this cat is beneficial to the rice field ecosystem, so it needs to be protected. This awareness shows that farmers understand their involvement is one of the important components in carnivore conservation in rice fields. The success of carnivore conservation is determined by community participation in implementing management practices that aim to reduce threats to carnivores and resolve conflicts. Currently, many rural communities still maintain misperceptions of human-carnivore relationships that hinder carnivore conservation. Therefore, it is important to expand the understanding and integration of community perceptions of carnivores as part of conservation strategies (Zorondo-Rodríguez et al. 2019).

Sunda leopard cat is one of the wildlife that has the potential to be a biological pest control in agricultural areas (Silmi et al. 2013; Silmi et al. 2021; Shanida et al. 2023). This potential is also recognized by farmers in the study sites based on their experience in interacting with these cats in rice fields. Farmers believe that these cats play a role in maintaining the balance of rice field ecosystem against the threat of an excessive population of rice field rats. Rice field rats are one of the pests that can damage rice plants, causing crop failure and impacting local economies in various countries (Jones et al. 2017). The results showed that 21 of 27 respondents agreed that conservation action is needed for this cat so that the balance of the agricultural ecosystem is maintained. Also, 22 of 27 respondents agreed that action is needed to conserve these cats to maintain their population on farms. Trajçe et al. (2019) mentioned that people who experience losses due to carnivores will have a high perception of conflict, while those who do not have a perception of conflict will have a positive attitude toward the existence of carnivores.

Farmers' desire to preserve Sunda leopard cat in rice fields shows that the coexistence between them has been ongoing for a long time. All respondents (100%) had in common the local name for this cat known as ‘Harimau Buluah’, meaning ‘the tiger that farmers often see in bamboo clump’. Farmers reported frequent encounters with this cat in the rice fields. Shared areas between humans and wildlife allow for high-intensity encounters (Sulaksono et al. 2023). Farmers' experiences with Sunda leopard cats have made them gradually realize the ES that these cats provide to them. Therefore, whether consciously or unconsciously, farmers have been involved in conserving this cat and will continue to make this effort. When coexistence becomes the main goal of conservation efforts, it can be assumed that there has been a reduction in conflicts and negative interactions between humans and wildlife, as well as a change in human behavior towards more caring for wildlife and efficient use of wildlife potential (Glikman et al. 2021; Nguyen et al. 2024).

Community support in conservation monitoring and management is needed because it can cover a wide area (Biggs et al. 2017). A total of 23 of 27 respondents agreed that farmers and communities around Nagari Batu Taba farms should be involved in the protection of Sunda leopard cats according to the regulations established by the government. This role is needed, especially in preventing poaching and illegal trade of Sunda leopard cats. A total of 15 of 27 respondents agreed that any Sunda leopard cat poaching activity should be penalized. Utilizing the contribution of local communities in monitoring and law enforcement will greatly benefit conservation implementation as it is less costly than using state apparatus. It is necessary to strengthen local institutions by involving Indigenous communities to legitimize conservation implementation. In addition, involving non-governmental organizations (NGOs) can help ease the state budget (Ntuli et al. 2021).

Conservation implementation requires substantial funding to ensure sustainable effort (Cosma et al. 2023) and is deeply reliant on good governance. While farmers demonstrate a keen willingness to participate in conservation activities, they also recognize their economic limitations. The findings of this research underscore that farmers would feel more supported and motivated if there were programs and funds from authorized agencies. A staggering 26 of 27 respondents agreed that farmers expressed their agreement with central government support, 27 of 27 respondents agreed with local government support, and 25 of 27 respondents agreed with NGO support. This resounding consensus underscores the pivotal role of these institutions in fostering farmer participation. Community-based conservation has become an important medium for various institutions, conservation NGOs, and governments in maximizing conservation efforts (Noe and Kangalawe 2015). Good governance by the government is necessary to ensure controlled wildlife management and protection from threats (Pomeranz et al. 2021). It is important to maintain a mutually beneficial relationship between organizers and communities to achieve conservation goals (Nekaris et al. 2017). In addition, to ensure sustainable and fit-for-purpose conservation implementation, communities must be actively involved in decision-making. Therefore, the institutions responsible for conservation efforts must be able to adapt to socio-ecological changes in society following the times (Decker et al. 2016). Providing necessary training, equipment, and support to local communities can enable them to operate independently (Ntuli and Edwin 2018).

Implications of farmers' perception of Sunda leopard cat in rice fields

This research is one of our initial efforts to evaluate the status of Sunda leopard cats in rice fields. In this human-dominated landscape, the existence of these cats faces threats from various human activities. Understanding farmers' perceptions of Sunda leopard cats in the rice fields is an important basis for designing appropriate conservation strategies. By knowing farmers' perceptions,

suggestions for the conservation of this cat were obtained. The results show that farmers and surrounding communities have great potential as conservation agents and can assist researchers in conducting broader research. Here we provide implications of this research for conservation and future research of Sunda leopard cat: (i) LEK in local communities can be an effective tool for wildlife identification, collecting ecological information as baseline information, and covering large areas. Using LEK can save time, energy, and research costs, especially for hard-to-find wildlife; (ii) Farmers' belief in the benefits of Sunda leopard cat as a biological pest control of rice field rats requires in-depth research on the diet and behavior of this cat in rice field ecosystem. Fecal analysis and behavioral studies will strengthen this cat's potential as a natural biological pest controller; (iii) The coexistence between Sunda leopard cats and farmers in rice fields can serve as a model for protecting other wildlife, which can be sustained by implementing wildlife-friendly farming practices (Usio 2014). These practices will be successful if farmers and authorized agencies work together and commit to implementing them; (iv) The growing awareness among farmers about the importance of conserving Sunda leopard cat is gradually fostering wildlife-friendly farming practices. For instance, this approach has proven successful in Tungshiau Township, Miaoli County, Taiwan, where it has led to increased prosperity for local rice farmers (Hsu 2021); (v) Conducting a comprehensive threat assessment is essential to understanding the threats to these cats in human-dominated landscapes. This information can be used as a baseline to determine their conservation status and develop appropriate conservation action strategies; (vi) Further research is needed on the impacts and management of domestic dogs on the survival of Sunda leopard cat and other wildlife in human-dominated landscapes. Currently, there is limited information on the magnitude of domestic dogs' impact on wildlife in human-dominated landscapes; (vii) Farmers' commitment and willingness to engage in conservation efforts require strong support from government and non-government organizations. Involving communities will enable conservation actions to cover large areas directly and be effective; (viii) Outreach to farmer groups and education of communities around rice fields about the importance of wildlife conservation and conflict management in human-dominated landscapes are important.

In conclusion, farmers in the study site have good perceptions with the category 'Good' for all perceptions studied regarding Sunda leopard cat in rice fields. Farmers' perception of the importance of Sunda leopard cat in rice fields of Nagari Batu Taba was at an average percentage score of 76.74%, conservation and protection of this cat with an average percentage score of 78.08%, and farmer participation in its conservation efforts with an average percentage score of 93%. Farmers cause farmers' perceptions in the 'Good' category feel that Sunda leopard cat has an important role that is beneficial to the rice field ecosystem. Farmers believe that this cat helps control the population of rice field rats, which are the main pests of rice plants. The coexistence that has been built between farmers and Sunda leopard cat strengthens farmers' desire to be involved in the cat's conservation efforts. However, farmers also realize that there are threats to the cat's existence in landscapes dominated by human activities, so appropriate conservation facilities and strategies are needed. Government and non-government support is essential to ensure the sustainability of the cat population in rice fields. Socialization and education activities on the conservation of Sunda leopard cats and other wildlife in human-dominated landscapes will be a medium to engage local communities effectively. In addition, further research on the ecology and conservation of this cat in rice fields should be conducted to support the evaluation of Sunda leopard cat's conservation status in the IUCN RedList.

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