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Economic Mitigation Institutions: A New Approach to Livelihood Systems in Disaster-Prone Areas

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ABSTRACT

Research on livelihood systems tends to focus on livelihood assets, the transformation of structures, processes, and livelihood outcomes. During disasters, livelihood systems are disrupted, and various socio-economic issues may arise if not properly addressed. This research provides a perspective on social-economic mitigation institutions in the context of community livelihood systems in disaster-prone areas. The research advocates the need for economic mitigation institutions in vulnerable communities in disaster-prone regions. The framework of these economic mitigation institutions emphasizes economic commodification schemes. This research examines the institutional dynamics communities implement in economic mitigation as part of their livelihood systems in disaster-prone regions. This research adopts a qualitative constructivist approach to construct a new conceptual framework for disaster mitigation. Data is collected through in-depth interviews and focused group discussions (FGDs). The findings show that various insights provide potential solutions for disaster-prone livelihood systems based on theoretical analysis and empirical findings from disaster-prone areas in Indonesia. Economic mitigation institutions are crucial for vulnerable communities and essential for sustainable development. Moreover, communities residing in disaster-prone areas naturally develop survival strategies by utilizing available resources.

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1. Introduction

Social vulnerability resulting from disasters stimulates complex issues within community livelihood systems. Natural disasters often present an enigmatic reality due to unpredictable consequences. While disaster impacts are unavoidable, they can be minimized. Understanding how to build resilient livelihood systems to withstand the pressures of disasters is an urgent need (Fang et al., 2018). Climate change threats are also intertwined with the escalation of natural disasters, requiring local adaptation processes and resilient mitigation strategies in livelihood systems (Swart & Raes, 2007; Uy et al., 2011). Planning and management approaches for livelihood sustainability are currently lacking in considering post-disaster resilient livelihoods (Yang et al., 2023).

Sustainable livelihood systems should be capable of diversifying various participatory-based livelihood sources to ensure resilience in facing social vulnerabilities like the effects of natural disasters. Additionally, integrating local communities, culture, and the environment in the social-ecological system becomes essential in adapting to dynamic time sequences (Basel et al., 2020; Cavalleri et al., 2022; Ferrol-Schulte et al., 2013). The sustainable livelihood approach, using capital, has been widely adopted to indicate livelihood resilience in various studies (Quandt et al., 2019; Rudiarto et al., 2019; Thulstrup, 2015). In livelihood sustainability, the accumulation capacity of owned asset capital becomes a pillar of households' lives and a lifeline in facing future disasters (Prayoga, 2021; Quandt, 2018; van Dillen, 2003). Tangible assets can boost confidence in disaster preparedness, while intangible assets may lead to greater concern about future disasters (Yang et al., 2023). However, the combination of both tangible and intangible assets in sustainable livelihoods can enhance household confidence in adapting resiliently to disaster vulnerabilities. Natural disaster resilience requires accurate social, economic, and community capacity and institutional and infrastructural preparation (Kusumastuti et al., 2014). Post-disaster livelihood systems' realities still lack structured efforts in economic mitigation.

Contemporary social realities related to mitigation are dynamic and have various characteristics, necessitating the development of an economical mitigation theory within the livelihood system context for communities residing in disaster-prone areas. The concept of sustainable livelihood is widely used by experts (Drinkwater & Rusinow, 1999), (Sati & Vangchhia, 2017), (Brocklesby & Fisher, 2003), (Miranda et al., 2003), (Serrat, 2017), (Shah et al., 2022); specific aspects of livelihood strategies remain unexplored. This article includes economic mitigation as part of the livelihood strategy toward improvement. The economic mitigation concept is expected to complement the broader theory of livelihood systems by providing more detailed and specific explanations of how economic security measures are implemented within communities. Integrating economic mitigation into local livelihood strategies is hoped to enhance the theory of sustainable livelihoods for disaster-prone communities.

Efforts to optimize asset-based livelihood systems for social welfare improvement are still deemed insufficient to address the crises resulting from rooted social problems such as population explosion, migration, technological changes, price hikes, macroeconomic policies, social differentiation, and globalization trends, as well as shocks and disasters such as droughts, floods, pests, pandemics, and civil wars. Mitigation efforts for these crises remain "absent" in

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some models and livelihood empowerment policies. However, reducing the adverse impacts of disasters should be a priority for policymakers, especially regarding their effects on community livelihoods (Nasrnia & Ashktorab, 2021). Conversely, Ali & Rahut (2018) found that rural communities in the Himalayan Mountains of Pakistan applying the livelihood concept had better incomes and welfare.

The paradox of vulnerable rural communities facing situational vulnerability and crises remains unresolved in community empowerment. Inequitable access to tangible and intangible assets at the individual and community levels hinders the optimal functioning of vulnerable livelihood systems, especially in disaster-prone and impoverished areas. Strengthening livelihood assets (both tangible and intangible) can positively correlate with livelihood strategies, enhancing productivity (Chambers, 1995; Murugani & Thamaga-Chitja, 2018; Sherraden, 2006; Wijayanto et al., 2019). Bebbington (1999) and Kibria et al. (2018) also emphasized that various assets rural communities hold determine livelihood strategies to improve welfare. The capabilities provided by these assets enable better and more sustainable livelihoods.

Conversely, Sherraden (2006) indicates that many disaster-affected communities depend on philanthropic funding for direct consumption needs. This reliance can exacerbate post-disaster vulnerabilities in rural communities. For instance, Nasrnia & Ashktorab (2021) revealed that climate change and natural disasters, such as drought, have affected livelihood systems and household livelihoods, leading to economic and social vulnerabilities for rural households in the Bakhtegan basin, Iran.

This article offers an alternative option for conceptualizing sustainable livelihood and economic mitigation for communities in disaster-prone areas. Disaster management planning and post-disaster recovery efforts often focus on reducing physical disaster risks but neglect to develop a comprehensive longitudinal conceptualization of post-disaster livelihood mitigation. Consequently, post-disaster recovery for impacted communities relies heavily on philanthropic aid. The conceptual offering in this research has limitations in discussing various disaster contexts in disaster-prone regions with diverse social realities. Therefore, this research focuses on economic mitigation institutions as part of the livelihood system in disaster-prone areas.

2. Literature Review

2.1. Livelihood Systems: Tracing Economic Mitigation

Efforts to intervene and optimize asset-based livelihood systems for social welfare improvement are still considered insufficient in eradicating crises caused by rooted social problems such as population explosion, migration, technological changes, price hikes, macroeconomic policies, social differentiation, and globalization trends, as well as shocks and disasters like droughts, floods, pests, pandemics, and civil wars. Mitigation efforts for these crises are perceived as lacking in some empowerment models and policies through livelihood systems. However, reducing adverse impacts from disasters should be a priority and a focus for policymakers, especially concerning their effects on community livelihoods (Nasrnia & Ashktorab, 2021). On a different note, Ali & Rahut (2018) revealed that rural communities in the Himalayan Mountains of Pakistan, adopting the livelihood concept, experienced better income and welfare.

The transformation of livelihood systems, as proposed by van Dillen (2003) and updated by Pandey et al. (2017), through the analysis framework of village livelihood systems, is considered highly compatible with addressing situational vulnerability challenges (exposure, sensitivity,

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and adaptive capacity), trend crises, and shocks, especially for disaster-affected communities. Strengthening the livelihood platform system through asset capacity, such as natural capital consisting of land, water, and natural resources (environment) utilized by communities as a livelihood system reinforcement, is crucial. Physical capital focuses on assets created through economic production, such as buildings, irrigation, roads, machinery, telecommunications networks, etc. Human capital refers to resources related to skills, education, knowledge, work experience, and health. Financial capital includes monetary resources accessible to households, such as savings and credit assistance. Social capital encompasses trust, clientization, social networks, kinship relations, regional affiliations, ethnicity, and even alma mater (Chambers & Conway, 1992; Pandey et al., 2017; Sherraden, 2006; van Dillen, 2003). In addition to these "traditional assets," Odero (2003) and Sensenig (2013) added another essential asset, information capital.

Beyond the livelihood system platform, van Dillen (2003) also emphasized that sustainable transformation efforts of community livelihood systems are interlinked with access obtained through social relations (gender, social class, age, and ethnicity), institutions (rules and customs, land ownership, and markets), and organizations (associations, NGOs, local governments, and state institutions). Scoones (1998) further solidified the understanding of sustainable livelihood systems in rural areas by linking conditions, contexts, trends, shocks, and vulnerabilities (Pandey et al., 2017; van Dillen, 2003), which can affect livelihood resources (natural capital, financial capital, human capital, social capital, physical capital). Changes in livelihood resources can also impact organizational structures and institutional processes, which, in turn, are related to livelihood system strategies that ultimately intertwine with the sustainability of livelihood systems. Furthermore, Ellis (1998) and Tabares et al. (2022) emphasized that rural sustainable livelihood strategies consist of two social activities: resource-based (agricultural, livestock, and non-agricultural natural resources) and non-resource-based (village trade, cottage industries, and remittances), both of which can serve as alternative livelihood strategies to strengthen rural entrepreneurial capacity. Livelihood strategies that optimize resource-based and non-resource-based social activities will have implications for ensuring a more decent livelihood (increased income stability, risk levels, and seasonal vulnerabilities) and environmental sustainability (quality of land, water, forests, and biodiversity).

3. Research Methodology

This research adopts a constructivist paradigm with a qualitative approach. This paradigm and approach were chosen because the research aims to construct a new conceptual framework for disaster mitigation. Epistemologically, this study seeks to develop a new conceptual understanding to complement and expand existing concepts. Data collection techniques include observation, in-depth interviews, and Focus Group Discussions (FGDs). Additionally, secondary data from various literature sources and recent relevant research findings are utilized. The data analysis technique employed is interactive analysis (Miles and Huberman), allowing continuous discourse and dialogue between the research findings and analysis. This ensures that data and analysis can be refined and improved throughout the research process, including the possibility of refining conclusions based on new empirical or literary findings.

The research process consists of the following stages and cycles: (1) exploring and finding literature related to disaster mitigation; (2) mapping the literature and identifying opportunities for new research that has not been previously explored; (3) conducting field research in two locations, namely the Mount Kelud area in East Java and the Mount Merapi area in Central Java. The field research involves FGDs, observations, and in-depth interviews conducted both

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online and offline; (4) analyzing the research data; (5) constructing the conceptual framework; (6) drawing conclusions and providing recommendations.

The technical operationalization in the field involves conducting FGDs with village government stakeholders, including the Village Head, Village Secretary, Hamlet Heads, and the Regional Agency for Disaster Management. FGDs are also conducted with community disaster actors, such as Jangkar Kelud and Pasak Merapi. These FGDs aim to gather meso and macro-level data regarding the actions taken and the needs in facing disasters. The next step involves deepening the interviews. Based on the information obtained during the FGDs, further in-depth interviews are conducted with informants who possess crucial data. Several interviewees have experienced various episodes of Mount Merapi eruptions from the 1960s to the eruption in 2010. The total number of participants in the FGD activities is 60, and 14 individuals are involved in the in-depth interviews.

4. Results and Discussion

4.1. Learning from the Conditions of Disaster-Prone Communities in Indonesia: The Wounds of Society due to Disasters

Indonesia is an area that experiences various types of disasters. This is not only due to being located in the Pacific Ring of Fire but also because anomalies in climate and seasons contribute to the escalation of natural disasters. The destructive effects of these natural disasters have claimed many lives and properties. According to records from The National Agency for Disaster Countermeasure, abbreviated as BNPB, there are 11 types of disasters with massive intensity in Indonesia, namely landslides, floods, floods, and landslides, abrasion, tornadoes, forest and land fires, earthquakes, tsunamis, earthquakes and tsunamis, droughts, and Mount Merapi eruptions (Badan Nasional Penanggulangan Bencana, 2022).

Figure 1. Data and Information on Disaster Events in Indonesia throughout 2022
Source: Badan Nasional Penanggulangan Bencana (2022)

Figure 1 shows the distribution of natural disasters in Indonesia throughout 2022. Badan Nasional Penanggulangan Bencana (2022) notes that Indonesia, in 2022, has felt the destructive effects of disasters, with as many as 3,461 incidents. The massive destructive effects after the

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disaster have claimed a very large number of victims. In 2022 alone, 844 died, 8,724 were injured, 48 were missing, and 5,330,351 suffered and were displaced. Not to mention the damage to houses as supporting "planks" for the basic source of livelihood, which reached 1,056,460 houses. In addition, thousands of public facilities such as education, health, bridges, worship and offices were damaged by the disaster. Damage from the physical aspect can also paralyze people's livelihoods.

This shows Indonesia as a country that is very "familiar" and vulnerable to natural disasters because it is crossed by the most active mountain routes in the world (Adiyoso, 2018; Cahyono, 2014; Rahma, 2018). The disaster cycle in Indonesia is indeed very high in intensity. The closeness of daily life of people close to disasters should be able to coexist to minimize the destructive effects of disasters. Ironically, the high escalation of the disaster revealed the power of the wound, which was so massive and destructive.

The anomaly of the disaster in Indonesia does not seem to be a risk mitigation. The death toll continues to increase, and the physical destruction is so extensive that people's property and livelihoods are lost as a source of livelihood. This natural disaster's aftermath has become a "domino effect" of chronic social pathology that can damage the order of the social-ecological cycle. It is not only psychologically traumatic but traumatic to rise to look for new alternative sources of livelihood that have become deadlocked. After a disaster, the community should be able to take appropriate economic mitigation steps so that the sustainability of their livelihoods does not stagnate and sink into prolonged traumatic wounds so that the rise is only limited to the rhetoric of philanthropic programs that always dictate people's lives to become passive donors. After being affected by a disaster, people need to adapt and manage their livelihoods by utilizing the accumulation of capital resources in a resilient manner in dealing with life's pressures.

Disasters are indeed a scourge of traumatic wounds in people's lives. Especially those who live close to the source of natural disasters. In exposing their views in focus group discussions (FGD), the Jangkar Kelud and Pasak Merapi communities agreed that a disaster cannot be avoided, but its impact can be minimized. The views of disaster activists are also unanimous in the view that economic mitigation in a disaster process needs to be taken into account to reduce the destructive effects of a disaster. The paralysis of the community's livelihoods after the disaster needs to be calculated for the accumulation of capital sources that can support the resilience of the post-disaster-affected community. The involvement of stakeholders from village officials, youth leaders, village disaster preparedness teams (Disaster Risk Reduction Groups), and the community becomes the engine of recovery and generator of livelihoods in assisting the community in restoring the social-ecological cycle order responsively. The overview in the in-depth FGD also found a mitigation measure that naturally restores livelihoods carried out by the community, namely saving safe livestock (communal pens) and stocking up produce through a communal logistics warehouse. Restoring livelihoods can be an alternative measure of economic mitigation by communities in disaster areas.

4.2. Institutional Metamorphosis of Socio-Economic Mitigation

The concepts of mitigation and livelihood systems are different but can complement one another. The sub-theme of this paper will explain how metamorphosis and conceptual development are adapted to the needs of the community. Community needs are always evolving from time to time. On the other hand, the existing conceptual framework has not been able to answer these challenges fully. Metamorphosis in this context is how conceptual continues to develop to answer the needs of society.

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Disaster mitigation is often interpreted as saving a person or community in the face of a disaster. This concept was developed to analyze disaster conditions. The concept of disaster mitigation means how to save lives when a disaster occurs. Disaster mitigation aims to reduce risk, awareness of disaster risk, planning and technical disaster management. This disaster mitigation effort is carried out starting from prevention, when a disaster occurs and after a disaster. In this context, the main thing is security and protection for the community.

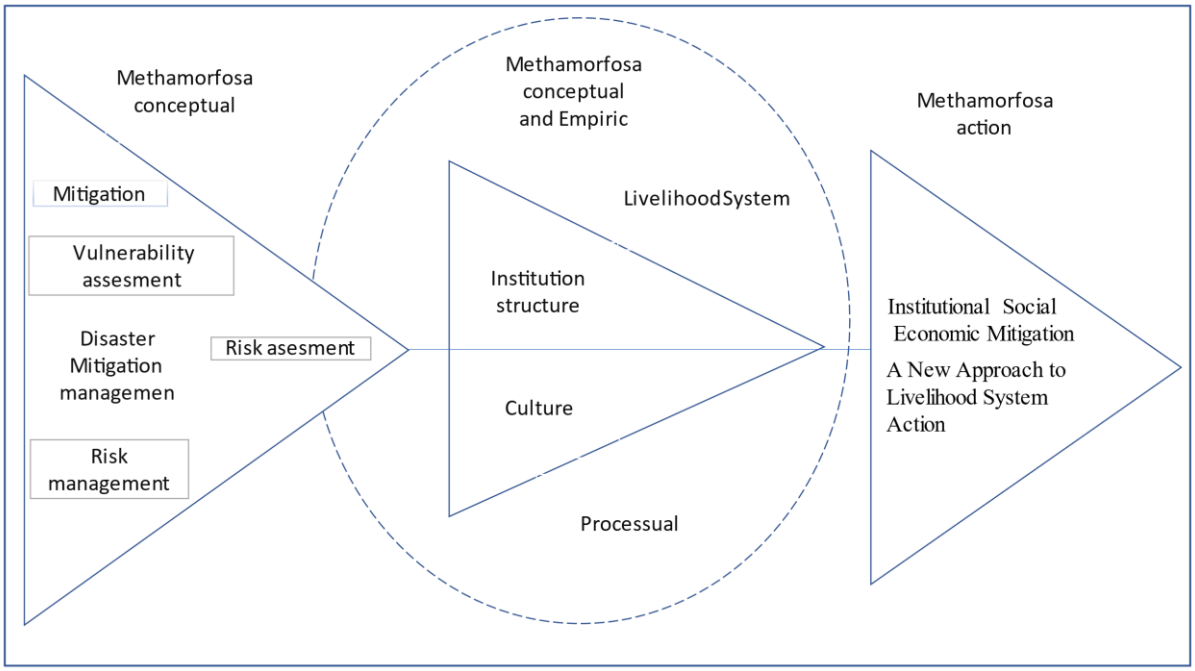

Figure 2. Metamorphosis Institutional Social Economic Mitigation
Source: Analysis Results (2022)

Disaster management has tools such as preparedness, prevention and hazard analysis. Various conditions are identified in this context, such as warning, evacuation of awareness and information, measure and exposure. Disaster mitigation can map various needs for community rescue. In this context, mitigation is directed at saving lives and the economy when natural disasters occur. Livelihood systems in disaster areas have unique characteristics. Natural resources in the mountainous region offer abundant resources.

On the other hand, the vulnerability of society is very high because they depend on nature for their livelihood. Understanding the livelihood landscape is important to provide an overview of livelihood systems in certain areas. Naturally, people in disaster-prone areas have mechanisms to maintain (a survival strategy) by utilizing resources.

4.3. Livelihood Systems Framework and Action Research Scheme

The condition of Indonesia, which is at the epicenter of the Ring of Fire, makes people vulnerable to natural conditions. Living in a disaster-prone epicenter does not make the community fully aware of its position and what actions to take when a disaster occurs. In some cases, disasters occur without any signs that can be anticipated. However, the community has not fully prepared the technical and economic preparations needed for disaster. On the other hand, society has resources such as human capital, political, financial, physical, social and natural.

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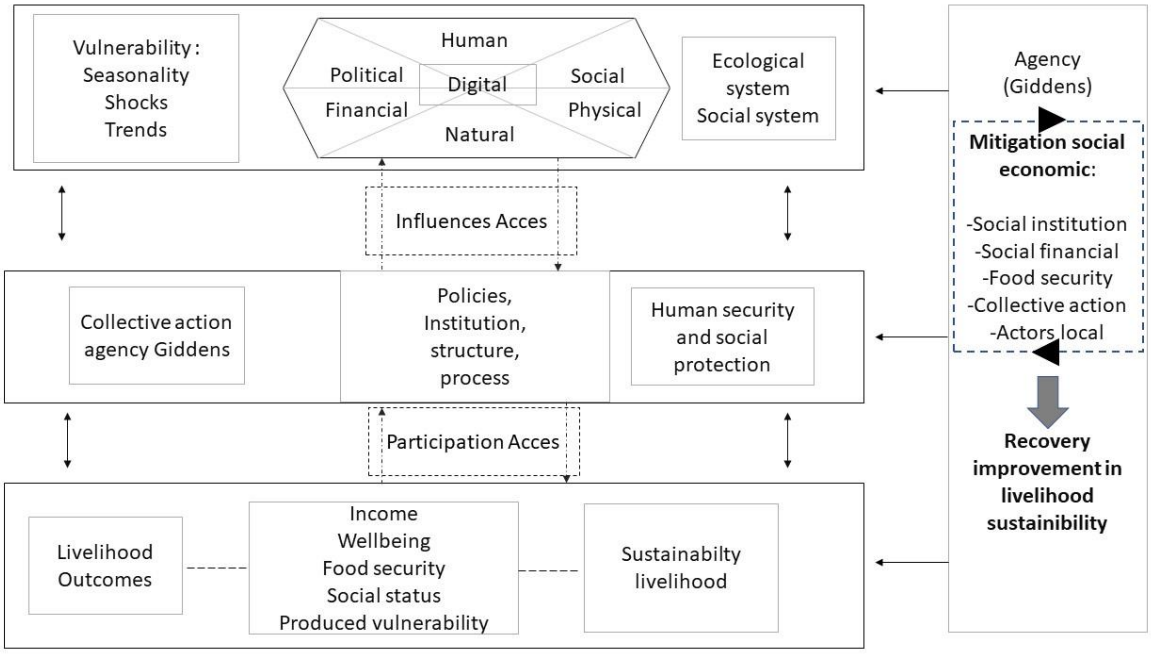

Figure 3. A New Framework for Livelihood Systems and Action Research Scheme
Source: Analysis Results (2022)

In improving the recovery of sustainable livelihood systems, it must be based on strengthening socio-economic mitigation by strengthening social institutions, social finance, food security, collective action, and overall participation from local actors. In the institutional structuration approach a la Giddens (Karp, 1986; Parsons & Giddens, 1980; Whittington, 1992), agency structuring can become an enabler of agencies in a larger subsystem, in this context, socio-economic mitigation—access whose involvement includes policies, institutional structures, and processes emphasizing access to participation and influence. Access to participation is supported by governance, whose subsystems are intertwined and tightly bound as a lubricant for relations at the macro-structural level and beyond meso- and micro-structuring. The interweaving of subsystem governance in socio-economic mitigation relations in disaster-prone communities will serve as a restorer of daily income sources, family food security, and sources of sustainable livelihoods. This is also supported by collective action guided by human security (natural protective abilities individuals possess in dealing with situational vulnerabilities) and social protection (collective and macro protection as a safety net for social security from situational vulnerabilities).

5. Conclusion

Disasters have become a recurring cycle in Indonesia, yet both communities and the government have not fully realized the challenges and threats they pose. The problems faced by communities continue to evolve dynamically. On the other hand, the conceptual framework for analyzing empirical issues in disaster mitigation and livelihood has been limited and has not seen significant development in recent years. This research aims to develop a concept that combines mitigation and livelihood systems to address disasters in Indonesia. Mitigation alone is insufficient to explain and address the complexities of disasters. Communities living in disaster-prone areas have unique characteristics compared to other communities, with their livelihood systems largely relying on natural resources. When disasters strike, these livelihood systems are disrupted, making preparedness, food security, financial stability, and security

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crucial elements of social protection for communities in disaster-prone regions. The research recommends local governments implement technical and participatory social-economic mitigation measures for communities. It emphasizes the importance of individual survival and planning for livelihood systems during and after disasters. Collective financial savings and long-term food security planning are essential. Communities should prepare strategic and operational plans facilitated by village governments to ensure sustainable livelihood systems during and after disasters. For future researchers, it is suggested to test the conceptual framework of this study through action research in disaster-prone communities.

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7. Declaration of Conflicting Interests

The authors have declared no potential conflicts of interest concerning this article's research, authorship, and/or publication.

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