Integrated rural socio-economic vulnerability analysis in Lampung Province

Dedy Yuliawan[1*]; Dedi Budiman Hakim[2]; Bambang Juanda[3]; Akhmad Fauzi[3]

[1)] Department of Economics, Faculty of Economics and Business, University of Lampung, Indonesia
[2),3)] Department of Economics, Faculty of Economics and Management, IPB University, Indonesia
[4)] Department of Resource and Environmental Economics, Faculty of Economics and Management, IPB University, Indonesia

**To whom correspondence should be addressed: dedy.yuliawan@feb.unila.ac.id*

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Abstract
One of the common characteristics of rural areas is their vulnerability to socio-economic and environmental shocks. Therefore, rural development policies should consider these features to take full advantage of the benefits of rural development. This study aims to develop a pastoral assessment based on the TOPSIS-Etropy-Inhomogeneity Method. This research was conducted in Lampung Province using data at the regency level. The data uses village data from the 2018 Village Potential Survey (PODES). The results show that rural areas' exposure, sensitivity, and adaptive capacity factors play an essential role in rural development regarding vulnerability and resilience. Pesisir Barat, Mesuji, and Tulang Bawang Regencies are highly susceptible to low adaptation factors such as difficult access to health centers, inadequate credit facilities from the government, quiet village anticipation and mitigation, and a lack of security systems. The lowest vulnerabilities are in Tanggamus and North Lampung Regencies with common sensitivity factors, where people with malnutrition, persons with disabilities, households living in slums, and the habit of not using river water or the like for drinking or cooking have lower scores. In addition, other factors contribute to vulnerability, and these factors should be considered in rural development policies.

Keywords: *Entropy, Rural development, TOPSIS, Vulnerability*

JEL Classification: D81, I31, R11

INTRODUCTION

Lampung Province is one of the provinces in Indonesia, and villages are an essential part of the economy of Lampung Province. Based on 2021 data shows that the agricultural sector is the sector that provides the largest contribution to the Gross Regional Domestic Product (GRDP), which is 28.39%. The population aged 15 years who work in the agricultural sector is 43.03%. The poverty rate in Lampung Province there is a downward trend, but the urban and rural poverty gap is still high at 4.68% (BPS, 2022).

In addition to the problem of poverty in rural areas in Lampung Province, various pressures or shocks affect the socio-economic conditions of rural communities. Based on data (BNPB, 2018), Lampung Province is included in the high category of disaster-prone areas. Supported by Village Potential (*Podes*) data in 2018, 36.17% of rural regions experienced disaster events. Cases related to pollution also occurred, with 27.84 rural areas experiencing water, soil, and air pollution cases. In addition, social conflicts often occur, considering that Lampung Province is a transmigrant area, so it has diverse ethnicities. The pressure or shocks in rural areas can result in rural socio-economic vulnerability. Therefore, vulnerability needs to be assessed as part of the success of rural development.

Since 2014, rural development has become the concern of the Government of Indonesia with the enactment of Law of the Republic of Indonesia Number 6 of 2014 concerning Villages. The flow of government transfer funds increases rural development in villages. Shepherd (1998) explains that rural development means that progress goals in rural areas can be carried out jointly in a series of activities between the actors involved. The desired progress is not seen in material progress, such as the modernization paradigm but in progress that does not damage the livelihoods of future generations, such as the concept of sustainable development.

The success of village development needs to be measured, such as various positive measures that have been carried out, namely the Village Development Index (IPD) and the Developing Village Index (IDM). Both are made by two different institutions, where the IPD is made by the Central Statistics Agency (BPS). In contrast, IPD is made by the Ministry of Villages, Development of Disadvantaged Regions, and Transmigration. Aggressive development measures are often neglected, especially in rural areas such as vulnerability; as Chambers (1989) stated, they must pay attention to village vulnerability indicators. The same was said in the recent study of Yang et al. (2018) in China that vulnerability is an essential factor in rural development.

Many analyzes of vulnerability have been carried out, but no common definition can be used (Chambers, 1989; Yang et al., 2018; Kim et al., 2021). According to Kelly & Adger (2000), vulnerability is how individuals or social groups can or cannot respond to events that affect their lives. Chambers 1989) and Lazarte (2017) stated that vulnerability has two factors: external factors that drive susceptibilities, such as shocks and pressures caused by climate, social, economic, and political changes, and internal factors related to resilience/overcoming losses. Kim et al. (2021), who conducted research from 2000 to 2019 on vulnerability, stated that vulnerability could start from disaster risk. Bollin et al. (2003), and Fauzi (2021), build a concept about disaster risk through the hazard, exposure, vulnerability, and capacity and measures.

Vulnerability is an event that harms the population in a particular area. Frequent events such as climate change, natural disasters, social conflicts, disease outbreaks, and government policies impact people's lives, causing socio-economic vulnerabilities. These events affect an area's population, especially those sensitive to shocks, but the adaptability of the community will be able to reduce it. High sensitivity and low adaptive capacity are seen in groups of people with low incomes and high livelihood dependence on the primary sector. Research that supports vulnerability through exposure, sensitivity, and adaptive capacity factors has been carried out by several previous researchers, such as Weis et al. (2016), Vázquez-González et al. (2021), Nguyen & Leisz (2021), and Mekonen & Berlie (2021).

Rural areas have a high vulnerability compared to urban areas, as in the study of Yang et al. (2018). Vulnerability will be higher in rural areas because the livelihoods of rural communities in the agricultural sector depend on nature (Memon et al., 2020;

Maganga et al., 2021; Ahmadi et al., 2022). Other social, economic, political, and disease conditions can also lead to vulnerability, and the relationship that causes vulnerability can be associated with social, economic, and environmental categories. Therefore, rural vulnerability can be part of a sustainable development approach.

Previous studies of rural vulnerability have been more partial, such as by Fang et al. (2018), Yang et al. (2021), and Shen et al. (2022). They saw a negative correlation between shocks to livelihoods. De Silva & Kawasaki (2018) examines rural vulnerability due to climate change and its impacts on the agricultural sector. Likewise, many studies link the occurrence of natural disasters and the higher susceptibility of rural areas (Fang et al., 2018; Shen et al., 2022; Qazlbash et al., 2021). On the other hand, Abubakar (2021) studied the causes of vulnerability due to disease factors due to people's unhealthy way of life in the water areas. Research on rural vulnerability has not been used as part of a village development measure. Therefore, more comprehensive research is needed to describe rural vulnerability. Anderson (1993) and UNDP (1994) say that vulnerability has a negative relationship with exposure; therefore, development must pay attention to aspects of vulnerability.

Vulnerability is a characteristic of rural areas, and this aspect is often neglected in rural development. This study provides another perspective for rural development—measuring rural socio-economic vulnerability using the criteria of exposure, sensitivity, and adaptability criteria. In general, other studies only measure the vulnerability of one event, such as climate change, while the level of exposure has many other indicators. This study uses Podes 2018 data, applying several types of exposure and socio-economic capabilities of rural communities in dealing with shocks.

METHODS

This study uses a measure of rural vulnerability as a measure of development using three criteria, namely exposure, sensitivity, and adaptive capacity. The difference from other studies is that the exposure indicator used uses various external shock events, and this external shock harmed rural development. This quantitative research uses secondary data obtained from the Central Statistics Agency (BPS), namely the 2018 Indonesia Village Potential Survey (PODES) for the Lampung Province area of 2,446 villages in 13 regencies, namely: Lampung Barat, Tanggamus, Lampung Selatan, Lampung Timur, Lampung Tengah, North Lampung, Way Kanan, Tulang Bawang, Pesawaran, Pringsewu, Mesuji, Tulang Bawang Barat, and Pesisir Barat. This study uses the method used by Peng et al. (2017) in Yang et al. (2018) using TOPSIS (Technique for Order Preference by Similarity to Ideal Solution) and Shannon Entropy. Exposure, sensitivity, and adaptive capacity are used to measure vulnerability.

Table 1 . Vulnerability criteria

No.	Exposure	Sensitivity	Adaptive Capacity
1.	Environmental pollution: water	Villagers with malnutrition	Hard to reach Public health centers *(Puskesmas)*
2.	Environmental pollution: soil	Villages with disabilities	No credit facilities
3.	Environmental pollution: air	Family living in a slum area	No natural disaster mitigation
4.	Disaster incident	Inadequate source of drinking/cooking water	No environmental safety system
5.	Extraordinary Events due to the epidemic		Lack of access to health insurance
6.	Social conflict		
7.	Crime incident		

Source: Village Potential Survey (PODES 2018)

1. TOPSIS

TOPSIS is one of the MDCM methods used. The Technique for Order Preference by Similarity to Ideal Solution (TOPSIS) is one of the multiple criteria methods from several limited alternatives from the shortest distance as the best solution. TOPSIS is also from an unlimited number of criteria and options and compared to other MCDM methods, it is more efficient, powerful, and simple (Chakravarthi et al., 2020).

The stages carried out by the TOPSIS process in this study followed by Peng et al.(2017) in Yang et al. (2018) are as follows:

a. The TOPSIS method evaluates the following decision matrix containing malternatives related to n attributes (criteria):

$$D = \begin{matrix} A_1 \\ \vdots \\ A_i \\ \vdots \\ A_m \end{matrix} \begin{bmatrix} X_{11} & X_{1j} & \cdots & X_{1n} \\ \vdots & \vdots & \cdots & \vdots \\ X_{i1} & X_{ij} & \cdots & X_{in} \\ \vdots & \vdots & \ddots & \vdots \\ X_{m1} & X_{mj} & \cdots & X_{mn} \end{bmatrix} \quad (1)$$

where:

A_i : Alternatives used

X_{ij} : The numerical value of to i alternative and its relation to the j criterion

b. Create a normalized matrix. This process tries to convert various attribute dimensions into nondimensional attributes, allowing comparisons between attributes.

$$r_{ij} = \frac{x_{ij}}{\sum_{i=1}^{m} x_{ij}^2} \quad (2)$$

where:

I : 1, 2, 3, …, m

J : 1, 2, 3, …, n

r_{ij} : Elements of a normalized decision matrix.

X_{ij} : Matrix elements

c. Matrix is weighted

$$Z_{ij} = r_{ij} * \omega_j \quad (3)$$

where:

ω_j : weight attribute to j

d. Calculate the distance from each alternative to the positive ideal solution and the negative ideal solution

$$D_i^+ = \sqrt{\sum_{j=1}^{n} \left(Z_{ij} - Z_j^+\right)^2}, i = 1, \ldots, m \quad (4)$$

$$D_i^- = \sqrt{\sum_{j=1}^{n} \left(Z_{ij} - Z_j^-\right)^2}, i = 1, \ldots, m \quad (5)$$

where:

D_i^+ : shows the distance between to i alternative and the positive ideal solution

D_i^- : shows the distance between to i alternative and the negative ideal solution

Z_j^+ : max (zij, i = 1, 2… m)

Z_j^- : min (zij, i = 1, 2… m)

e. Approach proximity to the ideal solution

$$C_i = \frac{D_i^-}{D_i^+ + D_i^-} (i = 1, \ldots, m) \quad (6)$$

f. Calculating vulnerability

$$V_i^* = V_{ex_i} * V_{sen_i} * V_{ac_i} \quad (7)$$

where:

V^* : rural socio-economic vulnerability with TOPSIS
V_{ex} : rural exposure category with TOPSIS
V_{sen} : rural sensitivity category with TOPSIS
V_{ac} : rural capacity adaptive category with TOPSIS

2. Shannon Entropy

Cannikin is used as the code name for nuclear development in the United States. Potential hazards, especially the environment, have been debated on minor risks such as earthquakes and radioactivity (Peter, 1971). Cannikin Law is similar to the Wood Bucket Theory, which explains that the water capacity does not depend on the bucket's length but on the wood's shortness. Through this concept, it can be demonstrated that the most disadvantaged part due to vulnerability is the part with the lowest condition/ability in the village.

Data fluctuations are often ignored so that the indicator's high value becomes a measure biased towards the results. Therefore, measuring the vulnerability of inhomogeneity using the Shannon Entropy concept can cover the uncertainty of the information received. It can be said that entropy is a quantitative measure of the average knowledge of all events. If the value is considerable, the uncertainty is higher, and if the value is small, the uncertainty is lower. This concept of uncertainty by Peng et al., 2017 in Yang et al. (2018) as inhomogeneity, and the following is the calculation:

$$H_i = -k \sum_{j=1}^{n} f_{ij} ln f_{ij}, (i = 1, \dots, n) \quad (8)$$

$$f_{ij} = \frac{z_{ij}}{\sum_{j=1}^{n} z_{ij}} \quad (9)$$

$$k = \frac{1}{\ln n} \quad (10)$$

$$u_i = 2 - H_i \quad (11)$$

$$U_i^* = U_{gi} * U_{li} * U_{ci} \quad (12)$$

where:

H_i : entropy of some indicators
n : number of objects
u_i : object inhomogeneity
U* : rural socio-economic vulnerability with entropy
U_{ex} : rural exposure category with entropy
U_{sen} : rural sensitivity category with entropy
U_{ac} : rural capacity adaptive category with entropy

The results obtained from the TOPSIS method only assess the overall end of the assessed object and do not reflect the inhomogeneity of the dimensions of the inherited object. The development of Yang et al. (2018) is considered to combine the TOPSIS and Shannon Entropy values which can be used as a measure of vulnerability, as follows:

$$IRSV_i = V_i^* * U_i^* \quad (13)$$

where:

URSV : Integrated rural socio-economic vulnerabilities

RESULTS AND DISCUSSION

Rural socio-economic vulnerability with TOPSIS

Rural development is identical to rural characteristics such as vulnerability. The results of this socio-economic vulnerability through the TOPSIS method using the categories of exposure, sensitivity, and adaptive capacity to 13 Regencies in Lampung Province can be seen in Figure 1. The value of the rural category obtained from the TOPSIS calculation provides different vulnerability ratings between dimensions and a combination of the three. Namely, the ranking of socio-economic vulnerability with TOPSIS. Based on Figure 1a, the results of the exposure category values with the highest TOPSIS are Way Kanan, Lampung Selatan, Mesuji, and Lampung Tengah. The high exposure value in the four areas causes the four regions to have a high exposure category with TOPSIS. The type of exposure that varied between villages in each regency showed that the highest exposure occurred in the eastern rural areas of Lampung Province. Only data on extraordinary events (KLB) has a minimal value, while others are very high. Natural conditions, the environment, and human behavior cause different levels of exposure to occur in rural areas. Some villages are naturally disaster-prone areas. Earthquakes and volcanic eruptions are inherent in these rural areas and are examples that such rural regions will have different risks from the other areas. Rural development will experience setbacks when this disaster occurs.

On the other hand, natural disasters can also be caused by human behavior that causes environmental damage, thus risking rural development. Other shocks, such as disease outbreaks and social conflicts, pose similar risks, and the number of these events gives a high exposure value and creates an increased vulnerability.

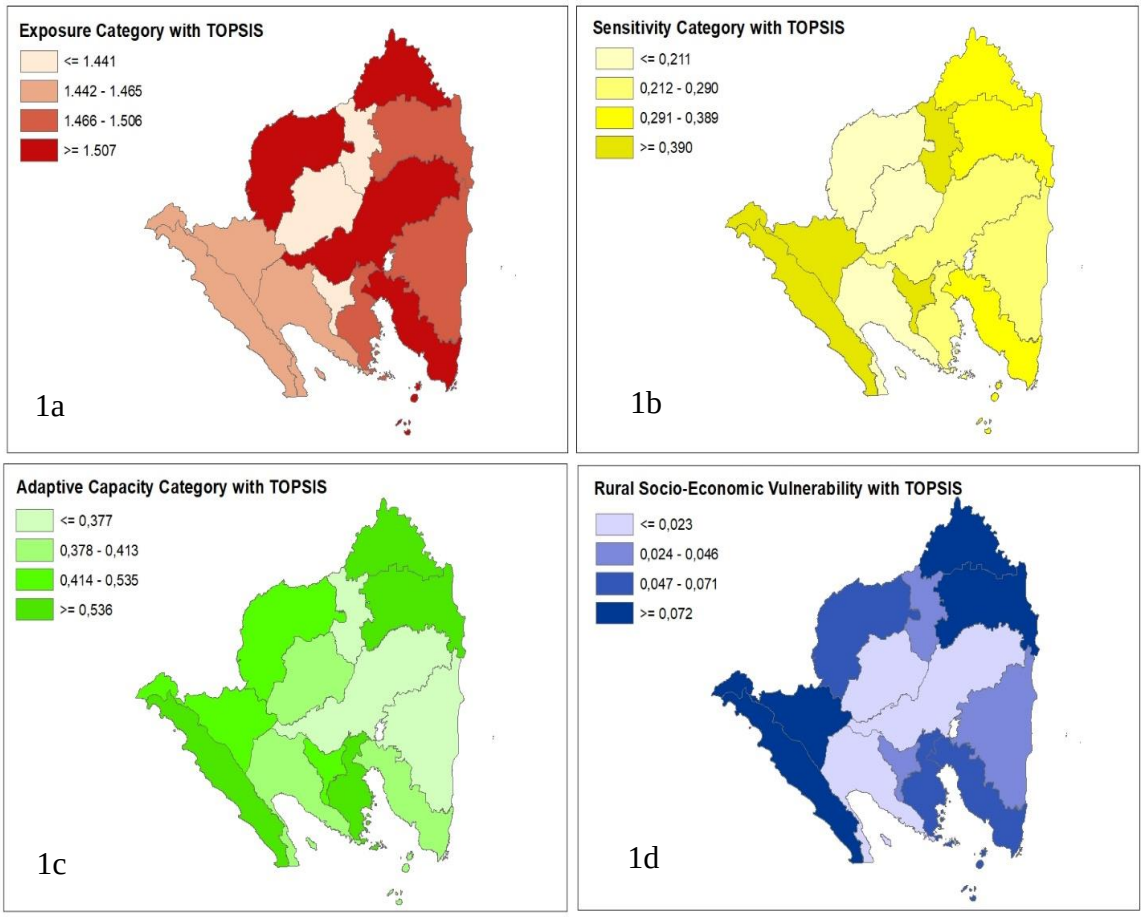
This study's results support and align with the findings of previous studies. Wicaksono & Jayanto (2021) found a relationship between the level of vulnerability and water pollution in the upstream river. Brochu et al. (2011), Yang et al. (2018), Fang et al. (2018), Shen et al. (2022), and Qazlbash et al. (2021) found a link between vulnerability and natural disasters. Furthermore, Stanturf et al. (2015) and Krauss et al. (2022) found a relationship between rural vulnerability to outbreaks such as disease outbreaks. Seddon & Hussein (2002) show Nepal's social conflict cases' effect on rural development and livelihoods. On the other hand, Pantazis (2000) and Kober (2018) found that high crime levels impact people's life activities, especially the poor.

Exposure to risks will affect rural residents' lives (livelihoods). Villages with a high level of hazards, such as residents with malnutrition, people with disabilities, families with residential areas, and drinking/cooking water from rivers and the like, will have a sensitivity category with the highest TOPSIS. The Regencies of Tulang Bawang Barat, Lampung Barat, Pringsewu, and Pesisir Barat have a high level of sensitivity. The dominant category indicator in Tulang Bawang Barat Regency is residents with the highest malnutrition sufferers.

The category of adaptive capacity with TOPSIS can be seen in Figure 1c. The districts with the highest vulnerability are Pesisir Barat, Mesuji, Tulang Bawang and Pesawaran Regencies. The adaptive capacity of the village in dealing with shocks that occur will reduce the risk of vulnerability.

There are several indicators in the adaptive category that are used. The first is the ease with which the village community can access the *Puskesmas*. Based on the Regulation of the Minister of Health of the Republic of Indonesia Number 43 of 2019 concerning Public Health Centers, at least have doctors and other services such as midwives. The two credit facilities are KUR (People's Business Credit), KKP-E (Food

and Energy Security Credit), KUK (Small Business Credit), and KUBE (Joint Business Group Credit), which can improve the economy of rural communities, especially after the exposure. Next is the role of the village community in protecting the environment and crimes that may occur. Lastly is the existence of health insurance facilities for rural communities.



Source: PODES 2018 is processed using the TOPSIS method

Figure 1. Rural socio-economic vulnerability results with TOPSIS

The results of rural socio-economic vulnerability with TOPSIS are obtained by combining the abovementioned categories, namely the exposure category, sensitivity category, and adaptive capacity category, according to equation 6 (six). The results of rural socio-economic vulnerability with TOPSIS can be seen in Figure 1d. The highest susceptibility is found in the Regencies of Pesisir Barat, Mesuji, Lampung Barat, and Tulang Bawang.

High and low rural vulnerability in each regency depends on indicators in each category of exposure, sensitivity, and adaptive capacity. Pesisir Barat Regency is very high in the category of adaptive capacity and sensitivity but low in the level of exposure. Mesuji Regency is very high in the adaptive capacity and exposure categories but low insensitivity. These results show that vulnerability highly depends on the categories and indicators that determine it.

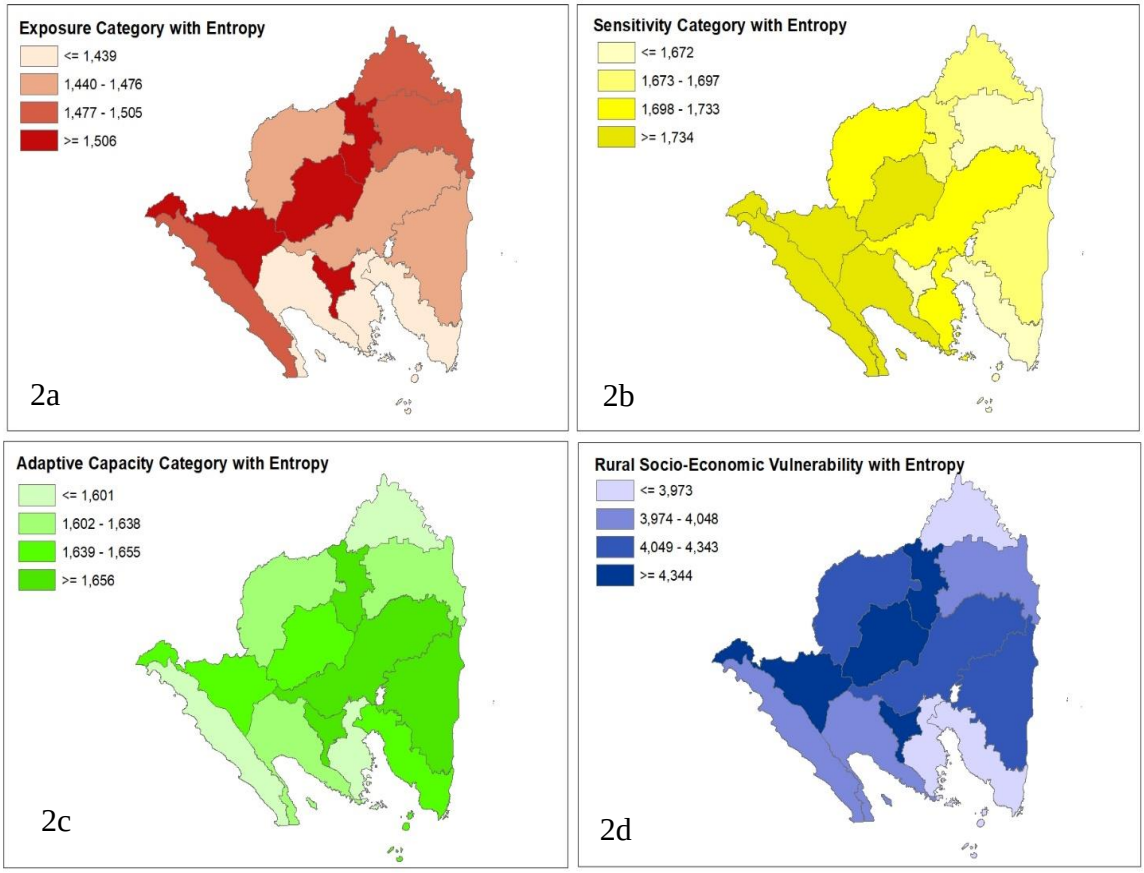
Rural socio-economic vulnerability with entropy

The low fluctuation of indicator values in each object in each category becomes an essential measure of vulnerability. This concept sees the high vulnerability not seen

from the high capacity/condition of the village to reduce the risk of disturbance but the smallest part of the existing village capacity/condition. High fluctuation of the Shannon Entropy value means high vulnerability, and low fluctuation indicates low vulnerability. The overall rural socio-economic vulnerability results with rural entropy are shown in Figure 2.

The exposure category with entropy is shown in Figure 2a. The variance values of the indicators in the various exposure categories indicate that the rural areas in the regency have a high level of exposure. The regencies are Pringsewu, Tulang Bawang Barat, Lampung Barat and North Lampung.

This result differs from the exposure category with TOPSIS, seen from the maximum or minimum indicator value. In contrast, the exposure category with entropy is seen from the fluctuation of the indicator value. Different views in viewing vulnerability are not only seen from high or low exposure but also fluctuations in events that can cause vulnerability, as described in the concept of Wood Bucket Theory. The ratings in the categories may be the same but differ depending on the indicator data. The result could be a rural category with low TOPSIS and a rural category with high entropy. Vice versa, the TOPSIS rural category is high, and the rural category has low entropy.



Source: PODES 2018 is processed using the Shannon Entropy method

Figure 2. Rural socio-economic vulnerability results with entropy

The sensitivity category with entropy can be seen in Figure 2b, showing that several regencies have high categories for both TOPSIS and entropy, namely rural areas in Lampung Barat and Pesisir Barat Regencies. In full, the sensitivity categories with

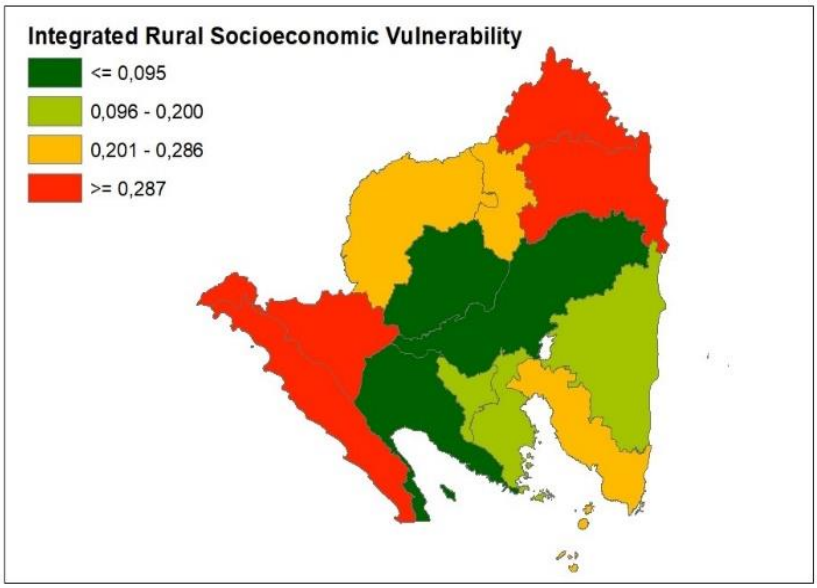
the highest entropy are Lampung Barat, Tanggamus, North Lampung, and Pesisir Barat Regencies. The indicator fluctuation of the sensitivity category shows that all four are higher than the others.

The category of adaptive capacity with entropy is found in Pringsewu, Lampung Timur, Lampung Tengah, and Tulang Bawang Barat Regencies, as shown in Figure 2c. Pringsewu and Lampung Timur Regencies show that the ease of access to health centers and credit facilities is good. However, the community's initiative to protect the environment and security is still excellent. These vulnerabilities and vulnerabilities make it easier to identify and what policies are appropriate to address them.

The final result of vulnerability inhomogeneity is a rural socio-economic vulnerability with entropy shown in Figure 2d using equation 12 (twelve). The highest vulnerabilities are in the Regencies of Lampung Barat, Tulang Bawang Barat, Pringsewu and North Lampung. This vulnerability is the basis of the previously set values and gives an idea of the high instability of the indicator. Of course, the policy to overcome this vulnerability reduces the negative value, not the positive value.

Integrated rural socio-economic vulnerability

This integrated rural socio-economic vulnerability can identify the main driving factors for high vulnerability. In rural areas in Pesisir Barat Regency, it is known that the main driving factor is vulnerability to TOPSIS, as seen in Table 2, in column V*. Another main driving factor caused the high V* results in the Vac and Vsen columns. Likewise, in Lampung Barat Regency, other driving factors are higher than before, namely vulnerability to entropy in column U*. The high integrated Rural Socio-Economic Vulnerability in Lampung Barat Regency is a matter of the indicator height in the category and the high fluctuation in the indicators.



Source: Podes 2018 is processed using a combination of TOPSIS and Shannon Entropy methods

Figure 3. Calculation of integrated rural socio-economic vulnerability results

Integrated rural socio-economic vulnerability is obtained from the union of rural socio-economic vulnerability with TOPSIS and rural socio-economic vulnerability with entropy according to equation 12 (twelve). The results can be seen in Figure 3. The combined results of the two contribute two so that a vulnerability rating can be

obtained, providing better results.

Integrated rural socio-economic vulnerabilities yield results from two different methods, reinforcing the effects of the previous level of vulnerability. The main driving factor of vulnerability can be information on how an area experiences high vulnerability, and this information will be beneficial for policymakers in tackling high vulnerabilities.

This rural vulnerability can be a measure of development from the opposite side. A more comprehensive indicator of external shocks in rural areas in Lampung Province, combined with the sensitivity and adaptive capacity categories, results in a vulnerability rating. These rankings are generally grouped into specific regions, as shown in Figure 3—regencies in red with very high rankings group areas relatively far from the center of the provincial capital. Likewise, the orange ranking groups districts bordering other provinces. There is only one different district, namely Lampung Selatan Regency, which is the district with the highest population density. However, these results suggest that vulnerabilities are identical in remote areas.

Overall the results of the calculation of the level of integrated rural socio-economic vulnerability in Lampung Province are shown in Table 2.

Table 2. Calculation results between categories and socio-economic vulnerability of each regency

Regency	Vex	Vsen	Vac	Uex	Usen	Uac	V*	U*	IRSV
Lampung Barat	0.355	0.418	0.495	1.562	1.770	1.648	0.074	4.556	0.336
Tanggamus	0.356	0.102	0.378	1.419	1.760	1.602	0.014	4.001	0.055
Lampung Selatan	0.492	0.339	0.400	1.419	1.654	1.639	0.067	3.848	0.256
Lampung Timur	0.415	0.245	0.232	1.444	1.677	1.676	0.024	4.057	0.096
Lampung Tengah	0.442	0.239	0.206	1.440	1.713	1.660	0.022	4.097	0.089
North Lampung	0.240	0.138	0.392	1.506	1.749	1.649	0.013	4.344	0.056
Way Kanan	0.519	0.196	0.534	1.441	1.730	1.624	0.054	4.049	0.220
Tulang Bawang	0.439	0.291	0.565	1.484	1.666	1.607	0.072	3.974	0.287
Pesawaran	0.414	0.212	0.536	1.401	1.698	1.598	0.047	3.802	0.179
Pringsewu	0.201	0.404	0.414	1.572	1.642	1.685	0.034	4.348	0.147
Mesuji	0.482	0.297	0.672	1.486	1.673	1.597	0.960	3.969	0.382
Tulang Bawang Barat	0.280	0.454	0.361	1.562	1.694	1.656	0.046	4.382	0.201
Pesisir Barat	0.390	0.390	0.723	1.477	1.734	1.563	0.110	4.004	0.441

Source: PODES 2018 is processed using TOPSIS and Shannon Entropy methods

The value of the integrated rural socio-economic vulnerability (IRSV) is obtained by combining the results of the calculation of equation 7, namely the level of rural socio-economic vulnerability with the TOPSIS method (V*) with the equation 12, namely the level of rural socio-economic vulnerability using the entropy (U*) method. The value of V* is obtained by combining the values of Vex, Vsen, and Vac. While the weight of U* is generated by combining the values of Uex, Usen, and Uac.

CONCLUSION AND RECOMMENDATION

Conclusion

This analysis assesses rural socio-economic vulnerability using TOPSIS and Shannon Entropy which have never been used in Indonesia. The main driving factors

for rural socio-economic vulnerability can be identified through this vulnerability, whether due to socio-economic vulnerability with TOPSIS or socio-economic vulnerability with entropy. The combined results of the two make the Integrated Rural Socio-Economic Vulnerability rank more real.

Exposure, sensitivity, and adaptability indicators are essential in sustainable rural development. These categories become factors inseparable from rural development, especially in areas with a high level of exposure. The sensitivity of the vulnerable rural population will lead to vulnerability, and the adaptive capacity of rural communities plays a vital role in reducing vulnerability risk. The results show that Pesisir Barat, Mesuji, Lampung Barat, and Tulang Bawang Regencies are the most vulnerable rural areas.

This result follows the four regions' conditions as isolated areas and minimal access. The four regions are far from the provincial capital and border areas with other provinces. The sensitivity and adaptive capacity categories were significantly affected by the external shock that also occurred. Common adaptations include difficult access to the Public Health Center (*Puskesmas*), inadequate credit facilities from the government, anticipation, and mitigation of deserted villages, and security systems lacking high value in Pesisir Barat, Mesuji, and Tulang Bawang. Lampung Barat has evenly distributed conditions and is very high in the sensitivity category, namely on indicators of the population with poor nutrition, persons with disabilities, households living in slums, and the habit of not using river water or the like for drinking or cooking. Areas with rural conditions like this certainly cannot be equated with other villages, especially in rural development efforts.

Recommendation

The integrated Rural Socio-Economic Vulnerability carried out in Lampung Province can also be used for other provinces considering that data is available in each province. The government carries out appropriate policies with integrated vulnerability rating information.

Other development measures have weaknesses in capturing existing rural conditions. Rural areas in Lampung Province are different in environment, society, culture, and economy. Rural socio-economic vulnerabilities provide input to government policies related to rural development planning, which will not be considered rural development. Very vulnerable villages should have different development policies from villages that are not vulnerable.

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