MANAGERE
INDONESIAN JOURNAL OF EDUCATIONAL MANAGEMENT
PERMA PENDIS INDONESIA
ISSN : 2721-1053
E-ISSN : 2721-1045
Vol. 6 No. 3 (2024), p. 347-356
Available online at https://serambi.org/index.php/managere

Geographic Information System (GIS) in Mapping Divorce-Prone Areas: Implications for Family Education Policy

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DOI: https://doi.org/10.52627/managere.v6i3.729

Article History:
Received: October 2024
Accepted: November 2024
Published: December 2024

Keywords:
Geographic Information System (GIS), Mapping of Divorce-Prone Areas, Family Education Policy

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Abstract :
This study examines the use of Geographic Information System (GIS) in mapping divorce-prone areas and its implications for family education policy. Using a qualitative approach, this study used interviews, observations, and documentation to collect data. The results showed that GIS effectively maps areas with high divorce rates, which are influenced by factors such as education, economy, and age of marriage. GIS in family education policy allows for more targeted interventions, such as economic empowerment programs in areas with economic and education problems and communication training in areas with high divorce rates due to relationship problems. These findings strengthen the existing literature on the importance of geographic data-based policies to address social problems but also indicate the need for increased socialization to increase public acceptance.

Abstrak:
Penelitian ini bertujuan untuk mengkaji penggunaan Geographic Information System (GIS) dalam pemetaan daerah rawan perceraian serta implikasinya terhadap kebijakan pendidikan keluarga. Dengan menggunakan pendekatan kualitatif, penelitian ini menggunakan wawancara, observasi dan dokumentasi dalam pengumpulan datanya. Hasil penelitian menunjukkan bahwa GIS efektif dalam memetakan daerah-daerah dengan angka perceraian tinggi, yang dipengaruhi oleh faktor-faktor seperti pendidikan, ekonomi, dan usia pernikahan. Penggunaan GIS dalam kebijakan pendidikan keluarga memungkinkan intervensi yang lebih tepat sasaran, seperti program pemberdayaan ekonomi di daerah dengan masalah ekonomi dan pendidikan, serta pelatihan komunikasi di daerah dengan tingginya tingkat perceraian akibat masalah hubungan. Temuan ini memperkuat literatur yang ada mengenai pentingnya kebijakan berbasis data geografis untuk mengatasi masalah sosial, namun juga menunjukkan perlunya peningkatan sosialisasi untuk meningkatkan penerimaan masyarakat.

INTRODUCTION

Divorce is a social problem that is often overlooked, even though its impact is vast for society (Jaberi et al., 2022; Rinaldo et al., 2024). According to data from the Central Statistics Agency (BPS), the divorce rate in Indonesia shows a significant upward trend (Rofi & Salsabila, 2022; Saputera, 2024). This phenomenon has an impact not only on divorced couples but also on their children and extended families. In this context, mapping divorce-prone areas based on the Geographic Information System (GIS) is critical. This system allows the government and related institutions to analyze the distribution and factors causing divorce in certain areas. Through this research, we can obtain more accurate data to formulate more effective family education policies. By understanding divorce patterns, the policies designed can be adjusted to local needs, paying attention to regional characteristics and improving the quality of family education for divorce prevention. Therefore, this research is urgent in providing a more appropriate solution to overcoming the divorce problem. The problem of divorce in Probolinggo Regency has become quite a serious issue in recent years. The Kraksaan Religious Court recorded a spike in divorce cases involving young couples and couples with low educational backgrounds. Many factors contribute to this problem, ranging from economic and socio-cultural factors to communication problems in the household.

However, what is often overlooked is early prevention efforts through family education. For this reason, it is important to know which areas are prone to divorce in the hope of providing more effective interventions. However, without accurate and targeted data, the policies implemented often do not meet the actual conditions. Mapping of divorce-prone areas based on GIS can be a solution to identify locations that need more attention in terms of family education and divorce prevention. In the field, divorce in Probolinggo Regency has increased from year to year. At the Kraksaan Religious Court, it was recorded that many young couples filed for divorce, with the main reasons related to economic problems and incompatibility in the household. However, another phenomenon that is no less important is the lack of adequate family education in areas with high divorce rates.

In many cases, couples who experience divorce do not have sufficient knowledge about effective communication in the household or how to resolve conflicts without violence. This exacerbates the existing problem, making family education very crucial. However, no precise mapping exists of which areas need more intensive family education interventions. Therefore, using GIS, we can design more targeted policies and reduce the divorce rate in Probolinggo Regency. Previous research examining the use of Geographic Information

Several previous studies have shown that Geographic Information System (GIS) is important in assisting the decision-making process, especially in the context of social policy and regional development (Putri & Amrullah, 2024; Tarigan, 2024). Research by Yulita (2024) shows that GIS is very effective in mapping disaster-prone areas, such as floods and landslides, which then become the basis for the government in determining safe zones and developing risk mitigation strategies. Meanwhile, research by Aini et al. (2024) utilizes GIS to be

used as a reference in planning the construction of new schools more evenly and fairly. These findings confirm that GIS can present spatial data visually and analytically, strengthening the accuracy of policy formulation.

Several previous studies have shown that divorce is influenced by various social, economic, and cultural factors (Waliulu et al., 2024; Yunus et al., 2023). Penelitian Baiti & Purike's (2022) research revealed differences in divorce patterns between urban and rural communities, where in big cities, economic and work factors are more dominant, while in rural areas, social and religious norms play a more significant role in maintaining marriage. In addition, Azis (2021) and Rifka et al. (2024) examined the effect of family education on divorce rates, which showed that lack of education in communication and conflict management was the main factor in divorce among young couples.

Although several previous studies have applied GIS in divorce mapping, few have examined the relationship between such mapping and family education policies in depth. Existing studies have focused more on the technical aspects of GIS and have not considered the integration of GIS data with education programs that can help prevent divorce. In addition, most studies have not sufficiently highlighted the importance of involving local institutions, such as religious courts, in collecting valid and relevant divorce data. This study will improve these weaknesses by emphasizing the implementation of GIS mapping in the Kraksaan Religious Court and analyzing its implications for a more comprehensive and evidence-based family education policy. This study presents a novelty by combining GIS with family education policies based on divorce data. This approach has not been widely used in Indonesia, especially in Probolinggo Regency. GIS-based mapping developed in the Kraksaan Religious Court can provide a clearer picture of which areas need more attention regarding family education. By combining divorce data with detailed area maps, this study can help formulate more targeted and effective divorce prevention programs. This is very important because family education policies based on strong data and analysis will have more potential to reduce divorce rates in the future. Therefore, this study significantly contributes to family education management and social policy.

This study focuses on the central question: How can the use of GIS in mapping divorce-prone areas be integrated with family education policies in the Probolinggo Regency? The temporary argument that emerges is that we can obtain a more detailed mapping of areas with high divorce rates by utilizing GIS. In addition, integrating this data with family education policies can provide more targeted solutions to reduce divorce.

This study's main contribution is to provide new insights into using GIS to support more effective family education policies. It not only provides an overview of the spread of divorce but also relevant data-based policy recommendations. It is hoped that the results of this study can be used by local governments, educational institutions, and religious courts to design more appropriate and effective interventions for reducing divorce rates and improving the quality of family education in Probolinggo Regency.

RESEARCH METHOD

This study uses a qualitative approach with a case study research type to explore the phenomenon of mapping divorce-prone areas based on the Geographic Information System (GIS) and its implications for family education policy in the Probolinggo Regency. This study's primary and secondary data are primary and secondary. Primary data were obtained through in-depth interviews with key informants, such as Kraksaan Religious Court judges, Education Office officers, village heads, and families involved in divorce in Probolinggo Regency. This interview aims to understand their perspectives on divorce, the factors that influence it, and their views on existing family education policies. Secondary data will be obtained from related documents, such as the annual report of the Kraksaan Religious Court, divorce statistics data, and literature related to the use of GIS in social mapping.

The data collection procedure begins with initial observation to understand the context of the divorce phenomenon in Probolinggo Regency. The researcher will then conduct in-depth interviews with selected informants using purposive sampling techniques to explore further information. This interview will ask about the causes of divorce, the experiences of individuals or families involved, and their views on existing family education policies. In addition to interviews, researchers will collect relevant documents from the Kraksaan Religious Court and the Education Office to enrich their understanding of the policies implemented and divorce statistics in the area.

Data collected from interviews and documents will be analyzed using thematic analysis techniques, where researchers will identify key themes related to mapping divorce-prone areas, factors causing divorce, and implications for family education policies. This analysis is carried out inductively by grouping relevant information into specific categories. The results of this analysis are expected to provide a deeper picture of the factors that influence divorce and how GIS-based family education policies can be formulated to address divorce problems in the Probolinggo Regency.

RESULT AND DISCUSSION

Result

Use of GIS in Mapping Divorce-Prone Areas

Geographic Information Systems (GIS) are used in this study to map divorce-prone areas in Probolinggo Regency by integrating divorce data and causal factors, such as the age of marriage, education level, and economic status of divorced couples. GIS helps produce spatial maps that show the distribution of divorce in the area, thus providing a clearer picture for policymakers to design more targeted programs.

In an interview, one of the informants stated that the use of GIS for divorce mapping is very helpful in identifying areas with high divorce rates. According to him, GIS allows them to see more detailed data based on certain factors, such as age of marriage and education level. This makes it easier to formulate more effective policies to address divorce in each region (w_12).

An interview with one of the government employees also supports this statement. They stated that GIS is beneficial in providing more accurate data on

locations requiring family education interventions. With the mapped data, they can more easily determine family education programs based on the area's specific needs based on existing divorce patterns.

GIS has helped visualize divorce data fragmented in administrative reports based on observations. This mapping shows that most divorces occur in areas with low levels of education and lower-middle economic conditions. This indicates that divorce is influenced by emotional factors and social and economic factors that can be mapped with GIS to show existing patterns.

The results of interviews and observations clearly show that GIS has a positive impact on identifying areas prone to divorce. The resulting spatial data makes it easier for policy makers to see the problems in each region more clearly, allowing for more targeted and data-based policies.

Mapping with GIS shows that areas with high divorce rates usually have low levels of education and economic problems. This mapping creates patterns that lead to the need for policies tailored to local conditions, such as economic training or family communication education in certain areas.

Integration of GIS with Family Education Policy

Integrating GIS with family education policy refers to using data generated from GIS mapping to design education policies that can reduce divorce. With accurate geographic and demographic information, family education policies can be focused on areas prone to divorce, and programs can be tailored to the characteristics of each region.

With GIS-based mapping, they can design more targeted education programs, such as communication education programs for young couples in areas with high divorce rates. These programs aim to provide skills in managing conflict and improving communication in the household.

An interview with one of the teachers in an area often affected by divorce showed that they found it easier to design family education curricula after GIS data was available. By knowing which areas are prone to divorce, they can adjust the topics discussed in the family education program, such as managing stress in the household or effective communication.

Observations show that GIS-based family education policies are more reliable because they follow the area's specific needs. For example, in poorer and less educated areas, economic empowerment programs and practical skills education for young couples are more accepted than in more developed areas, which tend to be more receptive to education on communication and household relationships.

The data show that integrating GIS into family education policies makes it easier to design more effective programs. These policies can be tailored to local needs identified through GIS data, thereby increasing the success of family education programs in reducing divorce rates.

Integrating GIS into family education policies produces patterns that show that more specific and data-based education policies will be more effective. For example, areas with economic problems need more economic empowerment programs, while areas with high levels of education need more family

communication training.

Public Perception of Family Education Policy

Public perception of family education policy refers to the public's views and attitudes toward the importance of family education programs designed to prevent divorce. This relates to how the public understands and accepts policies designed based on GIS data to reduce divorce.

An interview with a village head in an area with a high divorce rate showed that the public generally does not fully understand the importance of family education. They tend to consider divorce a private matter that does not require government intervention. However, after explaining how family education can help reduce divorce, they expressed their readiness to support the policy.

One couple involved in a divorce expressed that they felt there was not enough information or support regarding family education before they decided to divorce. They admitted that if there had been a more intensive education program on household communication and conflict management, divorce could have been avoided.

Through direct observation, researchers saw a gap in understanding regarding the importance of family education in several areas. The public was very open to family education programs based on GIS data in some places. At the same time, there was doubt and resistance to this policy in other areas because it was considered too intrusive in personal matters.

From these data, it can be understood that although there is support for family education policies, public understanding and acceptance of them are still low. This suggests that it is important to conduct better socialization regarding the benefits of family education in preventing divorce and actively involve the community in planning such programs.

The pattern that emerges from this data suggests that although some communities are aware, many still do not understand the importance of family education in reducing divorce. Implementing GIS-based policies is challenging and requires more intensive socialization efforts.

Implications of GIS Mapping for Family Education Policy

The implications of GIS mapping for family education policy refer to the impact of GIS use in designing and adjusting family education policies that can reduce divorce rates. This includes changes in how policies are formulated based on spatial data that depicts the specific needs of divorce-prone areas.

A member of the Social Development Commission in Probolinggo Regency said that GIS mapping has provided a more substantial basis for designing family education policies. More accurate data on divorce-prone areas makes them more able to adjust policies that address specific problems, such as providing skills training for young couples or family communication education.

Community empowerment officers also stated that GIS mapping helped determine the priority of areas that needed intervention first. With precise data, they could allocate resources more efficiently to run family education programs in areas that needed it. GIS data showed high divorce rates.

Field observations showed that GIS mapping facilitated the determination of the right areas for intervention. This was very helpful in optimizing the use of resources because policies could be focused on areas that needed it most. For example, areas with low economic and educational problems may receive more practical and skills-based education programs. In contrast, more economically stable areas may focus more on communication and relationship management education.

GIS mapping has a significant impact on family education policy. The use of GIS allows for more targeted and effective policies by allocating resources to areas that need them most and designing programs that are more relevant to local needs. GIS mapping shows that areas with high divorce rates tend to have specific patterns, such as low education levels and complex economies. Based on these patterns, family education policies can be designed more effectively to target each area's specific needs.

Discussion

The results of this study indicate that the use of Geographic Information System (GIS) in mapping divorce-prone areas in Probolinggo Regency effectively identifies areas that require more attention in terms of family education. This finding aligns with existing literature, which states that GIS has great potential to integrate spatial data with social data to help formulate more effective location-based policies (Huang et al., 2021; McKitrick et al., 2023; Wei & Yao, 2022).

However, this study also shows differences from previous studies, especially regarding GIS implementation at the local level. Most previous studies have focused more on GIS mapping for general social issues. In contrast, this study links GIS to family education policies, a newer and more specific approach. This highlights the importance of GIS-based mapping in helping local governments formulate more targeted and data-driven policies. Integrating GIS with family education policies shows the importance of a data-driven approach in designing social policies. Previous literature, as suggested by Ehlers, Huber, & Finger (2021), also emphasizes that policies based on geographic data tend to be more effective and efficient. This study strengthens the findings by showing that family education policies integrated with GIS mapping can adjust interventions based on local needs. For example, areas with high divorce rates due to economic problems and low levels of education of couples can focus on economic empowerment programs and skills education, while areas with high divorce rates due to communication problems in the household are more in need of communication and conflict resolution training.

Thus, this study enriches the understanding of how GIS can be used to design policies that are more responsive to complex social problems. However, public perceptions of GIS-based family education policies show a gap in understanding and acceptance of these policies. This is in line with research by Du et al. (2021), which found that GIS. In Probolinggo Regency, although there is support for family education policies, there is still doubt about the effectiveness of the proposed program. Some people consider divorce a personal matter that

does not require government intervention. This suggests that although GIS-based policies have great potential, there needs to be increased socialization efforts to increase public understanding of the benefits of family education in preventing divorce. Therefore, the practical implication of this finding is the need to increase information campaigns and community involvement in policy planning and implementation.

The theoretical implications of this study relate to the contribution of GIS use in understanding and addressing social problems, especially in the context of divorce. This study adds empirical evidence that GIS is not only a technical tool but can also be used as a handy social analysis tool to design more targeted policies. These findings indicate that GIS-based family education policies can provide more effective results in tackling divorce if they are tailored to each region's specific characteristics and needs.

Therefore, this study provides important insights into integrating technology with social policy, which is very relevant to the needs of local governments to design more evidence-based programs. Overall, the findings of this study indicate that the use of GIS in mapping divorce-prone areas and integration with family education policies can provide more targeted solutions in addressing divorce problems in the Probolinggo Regency. The theoretical and practical implications are that this data-based approach can improve the efficiency and effectiveness of social policies. Although there are challenges in public acceptance of this policy, with increased socialization and community involvement, GIS-based family education policies can be a practical step to reduce divorce rates and improve the quality of family life in the future. This study concludes that using the Geographic Information System (GIS) in mapping divorce-prone areas in Probolinggo Regency provides valuable insights into designing more effective and targeted family education policies. The most important finding of this study is that GIS-based mapping can help the government and related institutions to understand more clearly the patterns and factors that influence divorce, allowing them to design more targeted prevention programs. The main lesson learned is the importance of spatial-based data in social policy planning, especially regarding family education, which aims to reduce divorce rates. The strength of this paper lies in its contribution to science in the field of technology integration with social policy, especially in the use of GIS as a social analysis tool that can be used to design data-based policies.

This study enriches the literature on the use of GIS in a social context, which was previously more limited to general issues. It shows the great potential of GIS in mapping social phenomena such as divorce. However, this study also has limitations, especially regarding the limited coverage area only in Probolinggo Regency, as well as the need to increase socialization in the community regarding GIS-based policies. Therefore, further research can explore the use of GIS in mapping divorce in other areas and develop more effective socialization methods to increase public understanding.

CONCLUSION

The conclusion of this study shows that the use of Geographic Information Systems (GIS) is effective in mapping areas with high divorce rates in

Probolinggo Regency, which are influenced by education, economic factors, and age of marriage. GIS can help design more targeted family education policies, such as economic empowerment programs and communication training. However, despite support for GIS-based policies, some people still have doubts about their effectiveness. This study highlights the importance of using geographic data in social policy and reveals the need for increased socialization so that the community will be more accepting of the policy.

The limitations of this study include the limited coverage area only in Probolinggo Regency, so the results obtained cannot be generalized to other areas. In addition, this study has not thoroughly tested other factors that may also play a role in the high divorce rate, such as local culture or more complex social dynamics. Methodological limitations also exist in the qualitative approach, which relies on interviews, observations, and documentation that may not represent all community perspectives. Therefore, further research can expand the scope of the area and develop more effective and comprehensive socialization methods.

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