The urgency of an early warning system for social conflict by using WhatsApp

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Abstract

The purpose of the study is to use integrated information technology to demonstrate the importance of the Early Warning System (EWS) for social conflicts that involve public participation. This study used a mixed-methods approach. A total of 267 respondents were involved. Data were collected using a questionnaire covering household socio-demographic characteristics, smartphone use, religious tolerance, inter-ethnic tolerance, social cohesion, social capital and participation in conflict prevention. The Focus Group Discussion (FGD) was carried out in four villages involving 12 people. The majority of respondents in this survey fall into the medium and high category when it comes to the respondents' inclination in the five variables: smartphone use, social capital, inter-ethnic tolerance, religious tolerance and social cohesion. It was found that participation in conflict prevention in society is in a low category. Enhancing public engagement in conflict prevention needs the immediate implementation of EWS for social conflict early detection through public involvement. The Android application particularly WhatsApp group can be used to create EWS at the village level at a low cost. Village leaders who serve to assess the village's vulnerability level can be involved in this process. Finally, all stakeholders can use the study's findings as a basis for developing policies related to the use of WhatsApp to reduce disputes in places susceptible to conflict.

Keywords: Early warning system, Social conflict, WhatsApp.

1. Introduction

There are currently about 37 provinces in Indonesia extending from Sabang to Merauke. Several provinces in Indonesia are known for the many social conflicts that occur such as those between tribes, community organizations, religions etc. Lampung is one of the provinces located in Indonesia. Conflicts between communities were common in Lampung Province between 2010 and 2016 [1]. According to the data, there were 39 villages in Lampung Province where there were widespread conflicts, making up 1.48 percent of all villages. Violent disputes   became more frequent in 2018 occurring in 44 villages or 1.66 percent of the total number of communities. According to the Institute of Statistics Centre of Lampung Province (2018), though there were not many events, the impact of the loss was significant on both a social and economic level. Meanwhile, Lampung Province is not a conflict-prone area but one of the areas where there are various types of social conflicts including conflicts related to land [2].

People who are not involved in the conflict may also suffer as a result of social conflict in addition to the group that is directly impacted. Thus, social conflicts have a variety of detrimental effects on society including mental disorders and physical loss.   In some cases, the negative impact of a social conflict is the tension between individuals or groups, damage to property and life, domination and conquest. Social disputes also have the effect of causing trauma to many people [3, 4] who experience chronic psycho-emotional problems [5]. There are many theories about the causes that create conflicts in Indonesia. Conflict has been widely perceived as a crucial component of the power struggle between different groups.   In fact, other factors that must be considered include the perception of the fight for necessities like safety, acceptance of one's identity, acceptance of one's existence, access to political institutions and engagement in the economy Humaedi [6]. Ruslan [7] stated that social conflicts related to race, religion and ethnicity that occur in Indonesia are at least caused by the egoism, exclusiveness, individualism and truth claims that spread to some groups of society.

Numerous studies revealed that there were still many problems   in which social conflicts should be addressed. Susan and Wahab [8] studied agrarian conflict cases in Mesuji, Lampung and concluded that the state still used a violent approach to managing conflict through police institutions. Meanwhile, civil society, particularly local communities, indigenous peoples and farmer groups responded to such conflict management with violence. The research result of Putri [9] also showed that reconciliation in resolving conflicts was a negative peace approach that only focused on solving direct violence. Simanjuntak [10] made the following statement regarding conflict prevention: security forces with the primary responsibility for preventing conflicts including Babinsa and Babinkamtibmas (both of which are social security forces) were not performing optimally. In addition, Babinsa's obstacles to early detection efforts included the following: the institutional capacity remained severely deficient, the level of special security for terrorism remained unfavourable, there was no cooperation in handling between related parties, the community's active role was poor   and there was still an issue with integrated management between related parties. Finding strategies to avoid disputes is more crucial than finding solutions for those that have already happened. Currently, there are no measurable steps from the government on how to detect potential conflicts in society by directly involving the role of the community. On the other hand, as technology advances, the government and the community may collaborate together to avoid conflict. Sudirman [11] suggested that increasing the use of social media and information technology will improve community involvement in the early detection of conflicts.   It is essential to develop innovations that can be applied to address the aforementioned issues and serve as a strategic and practical step towards preventing conflicts. The solution can be put into practice from a sociological perspective by using an empowerment strategy that involves making use of all relevant local and national resources in addition to boosting the use of technology. It is believed that early detection and control of regional situations and conditions for conflict prevention will be possible through the development of the Early Warning System (EWS) model also known as the social conflict early detection system model which is based on public participation and integrated information technology. An early warning system is a system built with the aim of reducing the risk of various disasters that may occur. From various previous studies, it was found that the use of EWS has been very widely used in various fields and needs such as the prevention of child maltreatment [12], the detection and prediction of deterioration in patient conditions in hospitals [13], dengue outbreaks [14], Methicillin-Resistant Staphylococcus Aureus (MRSA) outbreaks [15], floods [16, 17], famine [18], political violence [19], conflict prevention [20], social anxiety [21] and crisis situations [22]. In this study, the aim is to identify the urgency of EWS development for social conflict early detection by using an Android application. Advances in technology make it easier for humans to communicate. Many Android applications including the widely used social media app WhatsApp enable long-distance conversations. WhatsApp can be chosen as a tool for developing a social conflict early warning system because of its ease as a communication medium. Abdirashid [23] stated that social media can help with early warning of conflict by assisting stakeholders in mapping and identifying areas of high conflict risk. The use of WhatsApp and Information and Communication Technology (ICT) tools has the potential to be used to build peace [24]. The use of technology in the early warning system enables the community to participate in information sharing allowing other communities in conflict-prone areas to implement risk mitigation strategies as well as communication with conflict monitors that will remind key stakeholders [25]. Although EWS has been very widely used in other fields, the implementation of social conflict EWS by using Android applications needs to be discussed because it is easily and inexpensively applied. So, this study also discussed the strengthening of EWS implementation by using WhatsApp in conflict-prone areas. Various studies on community participation both in preventing and handling conflicts in Indonesia showed that community participation had a significant contribution. The community has local wisdom and noble values that have a positive impact on conflict management. A study conducted by Kesuma and Cicilia [26] showed that the values and character of Piil Pesenggiri (pride) itself were a manifestation of Islamic law and were pillars of the ideology of Pancasila (the ideology of Indonesian). Furthermore, the application of Piil Pesenggiri philosophy as an approach to conflict resolution to deal with conflicts in Semaka. Therefore, the Piil Pesenggiri philosophy was also expected to resolve

conflicts in other areas. Similarly, Syukron and Rusmadi [27] found that the values of the Lampung people in the form of Piil Pesenggiri being used to resolve land conflicts in Mesuji because these values are the basic principles of the Lampung people, namely the nickname of adek (principles of success), meet nyimah (principles of respect), nengah nyappur (principles of equality) and sakai sambayan (principles of cooperation) all of which are manifestations of the values of peace as a medium for conflict resolution. The study results will show the level of public participation in conflict prevention in conflict-prone areas. The purpose of this study is to reveal the urgency of the development of an Early Warning System (EWS) for social conflicts by using integrated information technology especially WhatsApp. So, it is expected to be able to anticipate early in order to control regional situations and conditions for conflict prevention using the Android application. This research not only practically supports and tries to enhance regional policies linked to social conflict resolution but also initiates and motivates community-based activities to strengthen security and peace in Lampung Province. Theoretically, the results of this study are expected to fill an "academic gap" that is related to the development of an early warning system for preventing social conflict. In addition, the results of this study are expected to contribute to the development of social conflict resolution models in Indonesia.

2. Methods

Several social capitals were noted as the foundation for the system's implementation in order to recognize the importance of developing EWS for the early detection of social conflicts. Mixed-method research was used in the form of surveys with the community, in-depth interviews and focus group discussions (FGD) to explore data and information comprehensively. A mix method is a research method that combines two research methods at once namely qualitative and quantitative at the same time to make the data obtained more valid, comprehensive, reliable and objective. This research was conducted in four villages, two each in South Lampung Regency (Agom village and Balinuraga village) and two villages in Central Lampung Regency (Bumi Ilir village and Bumi Aji village). These four villages were chosen because they had met the predetermined requirements. A total of 267 respondents were involved covering four villages. The profile of respondents includes the characteristics of gender, age group, ethnicity, status of house or residence, number of dependents, children, main occupation, income level and main occupation. Most of the respondents involved in this study were male namely 79.7% (220 people) while the remaining 20.3% (56 people) were women. When sorted by age category, 60.8% of the respondents are between the ages of 20 and 39. However, when observed by age range, the largest percentage was in the 20-29 years old age group (33.3%) followed by the 40-49 years old age group (27.9%) and the 30-39 years old age group (27.9%). The smallest percentage was in the age group of 50 years (4%).

Data were collected using a questionnaire covering smartphone use, religious tolerance, inter-ethnic tolerance, social cohesion, social capital and participation in conflict prevention. Table 1 shows six variables that are investigated in this study. The instruments were validated by experts who have expertise and capability in such kinds of research.

Table 1.
The variables studied.

Variable	Description	Unit
Predictor variable		
X_1 = SMA	Level of smartphone usage	3=High 2=Moderate 1=Low
X_2 = REL	Level of religious tolerance	3=High 2=Moderate 1=Low
X_3 = INT	The level of interethnic tolerance	3=High 2=Moderate 1=Low
X_4 = COH	Level of social cohesion	3=High 2=Moderate 1=Low
X_5 = CAP	Level of social capital	3=High 2=Moderate 1=Low
Dependent variable		
Y = PAR	Level of participation in conflict prevention	3=High 2=Moderate 1=Low

The Focus Group Discussion (FGD) was carried out in Bumi Aji village by involving 12 people from elements of the village apparatus, community leaders and representatives of the sub-district government. The discussion in the FGD focused on the issue of harmony between village communities and the involvement of the village community in efforts to prevent social conflict, the exploration of the role of social institutions and other interested parties in an effort to maintain social harmonization and the use of the smartphone application in detecting social conflict.

3. Results and Discussion

3.1. Results

There are six variables discussed in this study to see the urgency of EWS development for early detection of social conflicts namely smartphone use, religious tolerance, inter-ethnic tolerance, social cohesion, social capital and participation in conflict prevention. In this study, five predictor variables including smartphone use (X1-SMA), religious tolerance (X2-REL), interethnic tolerance (X3-INT), social cohesion (X4-COH) and social capital (X5-CAP) are used for participation in conflict prevention (Y-PAR) variable.

3.2. Smartphone usage

This section describes the respondent's smartphone or mobile phone usage patterns. There are at least seven sub-variables that were asked of each respondent regarding the activities or scopes of their usual smartphone use starting from the duration of smartphone use, the monthly costs incurred to buy credit or quota and the respondent's expression of statements about the use of smartphones. This study also identifies behavioural shifts in mobile phone use particularly before and during the COVID-19 epidemic. There is a change in the behavior of all respondents involved in this study related to the pattern of using cellphones that they often use. This finding is important to know because with the COVID-19 pandemic, almost all sectors of human life have been significantly affected. Similarly, with the use of mobile phones which are immediately more intense in use.

3.3. Religious Tolerance

The variable of religious tolerance is one of the most important concerns in this study. The portrait of the reality of religious tolerance at the research location becomes the basis or foothold for building social harmony through the prevention of social conflict. Referring to the results of field data shows that there is a general pattern that reflects the value of religious tolerance among the community which is quite well established. For example, in the statement "I understand and allow friends of different religions to practice their worship according to their beliefs", it is seen that almost the majority of respondents (74.4%) stated that their position was consistent with this statement.

3.4. Interethnic Tolerance

Another important variable in this study is tolerance among ethnic groups. Respondents were asked about mutual understanding, mutual respect, respect for equality and cooperation in the lives of society, nation and state. The data from the field shows that the portrait which is more or less the same as the previous variable also occurs in the inter-ethnic tolerance variable. This shows the consistency of the attitudes of the respondents regarding the issue of social harmonization both within the scope of religion and ethnicity. For example, the majority of respondents considered that "disliking of other ethnic groups" and "making negative comments" are behaviors that are not appropriate to be expressed in the community.

3.5. Social Cohesion

In the social cohesion variable, there is a tendency that is more or less the same as the previous two variables. Field data shows that the positive assessment of the suitability of the respondents confirms that the situation or condition of social capital at the research site is still well maintained. This finding is important in an effort to create social harmonization in the community.

3.6. Social Capital

The context of social capital in this study seeks to obtain a portrait of the reality of trust and solidarity in society. In this way, it will be clear whether the community's current social capital has resulted in collaborative effort and outstanding collaboration. It can be seen that compliance with norms is an important component of social capital. The data shows that the level of community compliance with norms is relatively good. Another element of social capital is the level of trust in the parties whose condition is still good.

3.7. Participation in Conflict Prevention

Another crucial variable revealed in this study is participation in conflict prevention. Conflict prevention efforts can be short-term, long-term and both structural and operational. Various actors should ideally engage proactively to identify indications of conflict and make the environment safe.

Among the six variables studied in this study, it can be seen that the distribution of observation values in each class is low, medium and high. The classification of the overall score for each respondent in this study will be easily known based on the level of categorization in each of these categories. In this case, the categorization level is used to determine the general description of each variable among each category of respondents studied in this study.

Table 2 shows a tendency that the first five variables (SMA, REL, INT, COH and CAP) have the same pattern where most (or even the majority) of respondents in this study are in the medium and high categories. However, another variable (PAR) has the highest percentage in the low group (61%). This is an intriguing observation because the dominant variable creating PAR is in the high category. The PAR variable is the inverse or displays a negative tendency.

Table 2.
Categorization of researched variables.

Category level	Scoring criteria	Category level percentage
Smartphone usage (SMA)		
Low	13 - 34.6	4
Moderate	>34.6 - 56.3	17.3
High	>56.3	78.7
Religious tolerance (REL)		
Low	25 – 56	5.1
Moderate	>56 – 87	45.2
High	>87	49.6
Interethnic tolerance (INT)		
Low	50 - 107.6	1.5
Moderate	>107.6 - 165.2	40.8
High	>165.2	57.7
Social cohesion (COH)		
Low	61-77.3	19.1
Moderate	>77.3 - 93.6	72.4
High	>93.6	8.5
Social capital (CAP)		
Low	68 - 100.6	9.9
Moderate	>100.6 - 133.2	69.9
High	>133.2	20.2
Participation in conflict prevention (PAR)		
Low	0 - 3.6	61
Moderate	>3.6 - 7.2	26.8
High	>7.2	12.1

3.8. Discussion

These findings indicate that although the respondents are at medium and high levels in the five variables forming participation in conflict prevention (PAR). It does not ensure that they will take active measures to prevent conflict. The community has not completely supported or ingrained tolerance ideals such as inter-religious and inter-ethnic tolerance which are crucial variables in improving community participation in conflict prevention. For example, the inter-religious tolerance variable shows that 45.2% of respondents are categorized as having a moderate level of tolerance. 49.6 respondents are categorized as high and the rest are categorized as low. Similarly, for inter-ethnic tolerance more than 40% of respondents have a moderate level of tolerance. Meanwhile, people with a high level of tolerance are the only groups that should be trusted as part of a society that wants to avoid conflict.

Low public participation in conflict prevention is a major problem in the process of minimizing and resolving conflicts in various regions. The government's conflict resolution programme would not be effective without community support and participation in its implementation. The participation of people who are usually involved in conflicts is the best way to minimize conflict in society. Therefore, it is necessary to find an effective way to increase community participation in conflict prevention. So, it is urgent to develop EWS in conflict-prone communities by involving the community itself as a social conflict detection agent. If the community is involved in conflict detection agents, it will increase community participation in the prevention of social conflicts.

Then, there was an urgency to develop an Early Warning System (EWS) for social conflicts by involving the public because of the low participation of the public in social conflict prevention. We are aware that social conflict has catastrophic effects on a large scale. Many citizens suffer from trauma [4] and chronic psychoemotional problems as a result of societal disputes [5]. The loss of properties and even lives is a common effect of social conflicts in many regions of Indonesia. Disasters due to social conflict are a central issue because they are also related to various other aspects of life such as ideological and political differences [28], the welfare of society [29], the economic, religious and cultural gap [30, 31] in addition to the low quality of information that occurs in the conflict system. Therefore, it is necessary to involve the wider community and various competent parties. Second, it is necessary to use information technology. Thus, it is necessary to have an integrated information technology-based community empowerment system in the context of conflict prevention to be able to anticipate and control regional situations and conditions for conflict prevention. According to Sudirman [11], to increase community participation in the early detection of conflicts, it is recommended to optimize the use of information technology and social media. Community empowerment is needed because the government's forces need community support. Simanjuntak [10] stated that security forces that have the main task and function of conflict prevention such as Babinsa and Babinkamtibmas (both security forces in society) have not worked optimally. Then, public participation in conflict prevention was proven to deal effectively with conflict. According to Kesuma and Cicilia [26], the application of Piil Pesenggiri philosophy as an approach to conflict resolution has become an effective way to deal with conflicts in Semaka. The development of EWS through the use of information technology especially smartphones for conflict prevention has a very good potential. Based on the results of the survey, people who use smartphones are in a high

category. It is commonly known that smartphones and Android is a need of society being applied very progressively in many sectors of life [32]. Almost all people use phones in their daily lives and the use of smart devices like smartphones has made this world smarter [33]. The development of EWS using smartphones or Android can mainly be implemented through social media applications as a familiar means of communication in society. People primarily use phones to communicate through social media. Tables 3 and 4 respectively show the purpose of phone use in the daily life of society and social media use in public.

Table 3.
The use of phone

The use of phone	Before COVID-19 pandemic		During COVID-19 pandemic	
	Yes (%)	No (%)	Yes (%)	No (%)
To contact family	98.1	1.9	99.9	0.9
To contact neighbours or friends	89.4	10.6	94.3	5.7
To find information	94.2	5.8	97.9	2.1
To spy activities of family members	80.2	19.8	81.8	18.2
To do online business	81.9	18.1	80.5	19.5
To spend leisure	94.4	5.6	94.6	5.4
To support religious activities	84	16	85.7	14.3
To read online news	91.7	8.3	92.5	7.5
To do online shopping	54.8	4.2	59.9	40.1
To take photograph	80.7	19.3	84.3	15.7

Table 4.
The use of social media

The use of social media	Before COVID-19 pandemic		During COVID-19 pandemic	
	Yes (%)	No (%)	Yes (%)	No (%)
WhatsApp	98.5	1.5	99.9	0.9
Line	26.9	73.1	30.2	69.8
Facebook	92.9	7.1	94.8	5.2
Twitter	33.5	66.5	32	68
Instagram	57.6	42.4	62.1	37.9
Linkeldn	19.9	80.1	15.4	5.4

In Table 3, it is found that people use mobile phones more than 90% to communicate whether contacting family, neighbors or friends. In Table 4, it can be seen that the WhatsApp application is the most widely used platform by respondents followed by the Facebook and Instagram applications. In fact, almost 100% of respondents use WhatsApp in their daily lives. The data shows that there is a tendency to increase the use of social media accounts before and after the COVID-19 pandemic. However, this is also a sign that the COVID-19 pandemic has also contributed to affecting respondents in using their social media accounts. In essence, social media is an important thing people use in their everyday lives. This massive use of social media should be an opportunity for stakeholders to minimize conflict by taking precautions.

So, the EWS submission in this study uses an Android application. Social conflict early warning systems can be built and implemented easily and inexpensively at the village level. The use of smartphones will cut the operational cost of the system and program [34]. This system is built using the WhatsApp group media of village leaders which functions to analyze the village's vulnerability level, discuss with fellow WhatsApp group members and take steps to prevent conflict by conducting persuasive communication with target groups to report the situation and condition of village security regularly to the authorities and to assist the authorities in carrying out the necessary security measures. The WhatsApp group is a means of communication for security officers on duty in the village.

In addition, NGOs [35], local governments [36], tribal leaders [37] and religious leaders [38] are also involved in conflict prevention initiatives and they have joined this WhatsApp group. WhatsApp groups can be an effective way to convey the rules to the public. Similarly, indigenous leaders and religious figures who play an important role in society can report the potential for conflict in society. In the case of tribal peoples, tribal leaders are the main actors in decision-making. Similarly, in religious business, religious leaders are also the main actors as part of decision making. If in the community there is a potential for conflict whether it is related to cultural or religious affairs, the relevant figures are the main people who will know it first.

Therefore, developing an early warning system by using WhatsApp groups containing community leaders is believed to be a powerful way to prevent conflict in conflict-prone areas. Meanwhile, Baudoin, et al. [38] stated that the development of EWS must integrate modern science and technology, therefore both contribute to improving the early detection and monitoring of risks. Communication and the issuance of early warnings can use modern communication channels. Disaster mapping and the early detection of risk factors for social disasters are the main functions of the EWS. In the context of increasing the use of mobile phones in the community, it can be the main capital for implementing EWS.

Ultimately, the only way for the system to respond to the specifications of community characteristics that are maintained over time is for the fulfillment of community needs to be prioritized over other needs.

The dynamics of conflict concerns stem from societal disparities as well as the competition for scarce and shared resources [39, 40]. Latent conflicts typically preserve social distance and do not show themselves openly. It is essential that the community participate in initiatives aimed at preventing conflict in society and preserving social peace. Haryanto [41] stated that community participation in the prevention or handling of conflicts in Indonesia has a significant contribution. Sometimes conflicts occur due to poor communication among community groups [42] and between communities and governments. In cases of natural resource conflict, communication through co-management between indigenous people and stakeholders is a way of dealing with conflict [43]. It is clear from the FGD results that society wants to live in harmony with one another and free from conflict. Therefore, to establish good communication between the government and the community and to realize early detection of potential conflicts, it is necessary to develop EWS by using WhatsApp groups containing government figures, indigenous leaders, religious leaders and other related parties.

4. Conclusion

The competition for the same resources contributes to conflict difficulties in addition to societal inequalities. Low public participation in conflict prevention is a major problem in the process of minimizing and resolving conflicts in various regions. In terms of conflict detection and prevention, the government's forces need community support. Subsequently, the low public participation in social conflict prevention highlights the importance of developing an Early Warning System (EWS) for social disputes by incorporating the public. The development of EWS through the use of information technology especially smartphones or Android for conflict prevention has very good potential. People who use smartphones have really high public participation in conflict detection and prevention, sharing information horizontally with others and vertically with conflict trackers and the government. The WhatsApp application is the most widely used platform among respondents. So, social conflict early warning systems can be built and implemented easily and inexpensively at the village level by using WhatsApp groups. In addition, conflict prevention efforts also involve community leaders, tribal leaders and religious leaders joining this WhatsApp group. This study result can be a consideration for all stakeholders to minimalize conflicts in conflict-prone areas. The limitation of this study is that it is a preliminary study underlying the development of EWS for social conflict prevention by using WhatsApp groups. This study discusses the facts in the community so that the development of EWS using WhatsApp groups needs to be developed immediately. Therefore, further research is needed related to the implementation and effectiveness of the WhatsApp group as an EWS in conflict prevention in conflict-prone areas.

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