EVALUATION OF THE SPREAD OF RADICALISM, EXTREMISM, AND TERRORISM IN INDONESIA'S DEFENSE USING AGENT-BASED SIMULATIONS

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Abstract

The issue of national disintegration is one of the most crucial in the defense of Indonesia. One of the causes of national disintegration is the existence of Radicalism, Extremism, and Terrorism (RET). Radical entities can change using extreme means including violence through acts of terror in achieving their goals. Efforts continue to be made by the Government in anticipating the spread of this RET. Using agent-based simulation modeling techniques, some characteristics in the RET such as numbers are affected, driving factors, the number of agents in a region, and effective strategies. Therefore, this study is aimed at evaluating the spread of RET in Indonesia using agent-based simulations. This research is qualitative descriptive by trying to collect qualitative data as an initial input for the creation of flowchart designs and agent-based simulation models that will eventually be verified and validated. The results of this study illustrate the agent-based simulation in the spread of RET using Netlogo software by paying attention to several parameters such as incubation period, possible exposure to radicalism, extremist severity, availability of rehabilitation centers, and the rate of terrorism infection. From the results of the simulation, it can be said that the parameter greatly affects the percentage of radical agents, agents who are extremists until they become terrorists. This factor can be evidence for policymakers to reduce the spread of RET effectively by increasing religious understanding, strengthening the sense of nationalism and defending the country, and implementing community empowerment strategies. The evaluation of the spread of this RET can eventually strengthen Indonesia's non-military defense. Thus, good defense will have implications for the continuous development and achievement of Indonesia's goals.

Keywords: agent-based simulation, defense, evaluation, Indonesia, RET

Introduction

An independent, sovereign, just, and prosperous Indonesia is the goal of the Indonesian nation and state as stated in the Preamble to the 1945 Constitution of

the Republic of Indonesia. This goal is fought for by maintaining sovereignty, territorial integrity, and the safety of the entire nation amid actual and potential threats. Presidential Regulation Number 8 of 2021 concerning the General Policy of State Defense for 2020-2024 explains the two threats. Actual threats for the next five years include violation of border areas/foreign intervention, separatism and armed rebellion, piracy, piracy, and hostage-taking of Indonesian citizens, terrorism and radicalism, cyber threats, threats of intelligence or espionage, threats of psychological warfare, biological weapons attacks, disasters nature and the environment, theft of natural resources, disease outbreaks, drug trafficking, and abuse, and the impact of the birth of the Industrial revolution 4.0. The potential threats are conventional war or open conflict (foreign invasion), nuclear weapons, the economic crisis, the threat of a pandemic, and foreign immigrants.

As an actual threat, terrorism and radicalism must be handled. The Director of Deradicalization of the National Counterterrorism Agency (BNPT) revealed that there is a separate process for a person to change from a radicalist to an extremist, to becoming a terrorist (Ansori et al., 2019). Radicalism underwent a total and drastic change. Radicalism overturns existing values, its characteristics are that they are intolerant or have no tolerance for groups who have different understandings outside their group. They also tend to be fanatical, and exclusive, and do not hesitate to use anarchist methods. In addition, radical entities can change using extreme means including violence through acts of terror in achieving their goals. Therefore, radicalism, extremism, and terrorism are one unit that becomes the focus to be overcome immediately.

Radicalism, Extremism, and Terrorism (RET) have been addressed by the Indonesian government as actual threats through the implementation of prevention, prosecution, and recovery. For example, in the context of prevention, the government has carried out both direct socialization and digital literacy about RET and its dangers. The reason is, the distribution is not only in face-to-face meetings but also using the internet. The head of BNPT revealed that terrorists spread their understanding with propaganda, starting from the recruitment process to even funding with online activities (BNPT, 2021). In addition, Deputy 7 of the State Intelligence Agency said that the ISIS terrorist network uses social media for propaganda (Liputan6, 2021). The problem is that this spread continues even during the current pandemic and it is feared that it could spread to various regions in Indonesia.

One of the efforts that can be done in anticipating the spread of RET is by simulating it in the form of a model. The modeling technique used is Agent-Based Modeling. This agent-based model simulation can be used by decision-makers in studying how small changes in behavior and interactions can affect output in a population through modeling interactions (Currie et al., 2020). In addition, agent-based simulation applications have also been used in various fields, namely in social, political, and economic sciences, including traffic simulation, customer flow management, stocks, innovation diffusion, evacuation modeling, adoption dynamics, and operational risk and organizational design (Bonabeau, 2002).

Based on the previous explanation, the author determines several problem formulations, namely:

1. What is an Agent-Based Simulation to prevent the spread of RET?

2. What are the things that must be considered by policymakers and the public in preventing the spread of RET?
3. How can the evaluation of the spread of RET strengthen Indonesia's defense?

This research is aimed at several things, namely:

1. Knowing the meaning, intent, and purpose of agent-based simulation to prevent the spread of RET.
2. Knowing the important conditions that provide steps for policymakers and the public to prevent the spread of RET.
3. Analyzing the benefits of evaluating the spread of RET in strengthening Indonesia's defense.

Literature review and research focus

Radicalism is an understanding or tradition that wants social and political change or renewal by violent or drastic means (KBBI Kemendikbud, 2021). Prof. Dr. Irfan Idris stated that radicalism overturns existing values, the characteristic is that they are intolerant or have no tolerance for groups that have different understandings outside their group, they also tend to be fanatical, exclusive and do not hesitate to use anarchist methods.

Alex P. Schmid (2013, p. 56) defines an extremist group as a group that adheres to the notion of extreme violence. Compared to radicalists, extremists tend to be closed-minded, intolerant, and anti-democratic and can justify any means to achieve their goals. Extremist groups are also closed-minded. This group is different from radical groups, groups that adhere to radicalism.

Meanwhile, according to Law Number 15 of 2003, terrorism is the use of violence or the threat of violence that creates a widespread situation of terror or fear of people and causes mass casualties, by seizing other people's property, resulting in damage or destruction of vital objects. strategic, environmental, public facilities, and state facilities.

A high tendency to adopt ideals or ideologies to extremes or radicals will lead to various kinds of behavior in individuals. BNPT (2012) states that terrorism in Indonesia will continue to grow if it continues to be fostered. Meanwhile, radicalism is the fertilizer for acts of terrorism. The tendency of high closed-mindedness contributes to the individual's interest in radical ideologies and decision-making to carry out acts of terror. Someone who has been exposed to a radical ideology will usually voice their understanding. When this is deemed insufficient, he will resort to violence or extreme actions even if he has to sacrifice himself to achieve goals or damage the existing status quo. This individual has a low tolerance and shuts himself off from the environment. He will categorize his environment into two parts, namely friends and foes.

A radical person or group can experience change using extreme means. Extreme violence describes the form of acts of violence based on radical or extremist beliefs, in other words when a person's understanding of his previous beliefs turns into an understanding in the context of violence, the individual has the potential to become a terrorist (Bjelopera, 2012, p. 2). Extreme violence through acts of terror is influenced by many things. Starting from the influence of international factors such as global injustice, arrogant foreign policy, and colonialism. In addition, it is also influenced by domestic factors such as

perceptions of injustice, welfare, education, disappointment in the government, and revenge. Apart from international and domestic factors, other factors are cultural factors, namely because of shallow religious understanding, narrow and textual interpretations of religion, and indoctrination of wrong religious teachings.

Agent-Based Modeling (ABM) is defined as a simulation modeling technique in which a system is modeled as a collection of agents and the relationships between them (Bonabeau, 2002). ABM uses a bottom-up approach to see how the interaction of individual behavior can affect system behavior with computer-based simulations. ABM is highly congruent with social systems because of the ease with which agents can map to recognizable social entities and the natural hierarchical organization that is easily visible in social systems (Borrill & Tesfatsion, 2011). ABM is a paradigm of testing and theoretical development (Smith & Conrey, 2007) with independent and dependent variables. In the case of ABM, independent variables (or "parameters") are adjusted by the experiment, while dependent variables are measured throughout the model or after the model.

Thus, evaluating the spread of RET as part of social conditions in the community is very appropriate if it is carried out using ABM simulation-based modeling. The main element in ABM modeling is the agent. Each agent acts and behaves according to the rules made in his environment. There are three elements in an ABM, namely (Macal & North, 2010):

1. A set of agents, their attributes, and their behavior.
2. A set of relationships and methods of interaction is a typology that underlies connectedness and defines how and with whom agents interact.
3. Agent environment. The agent interacts with its environment in addition to other agents.

These three elements are the basis for developers in making simulation models that are by existing social conditions. Karandeep Singh, Mazhar Sajjad, and Chang-Won Ahn (2016) describe simply how the process of an agent adapts and reacts to an ever-changing simulation environment. This is described as follows:
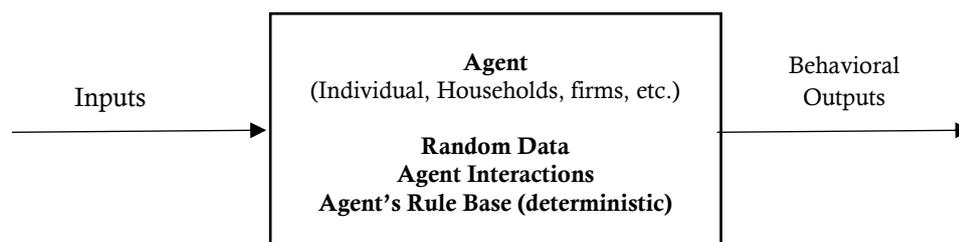

Figure 1. Agent based simulation concept
Source : (Singh et al., 2016)

André Calero Valdez (2020) make a simulation with ABM to see how to level the graph and the number of people infected with Covid-19 so that it can still be handled by maintaining physical distance and adjusting the capacity of the hospital provided. By creating an interface for the coding shared by Valdes, it can be displayed in Figure 2 below.
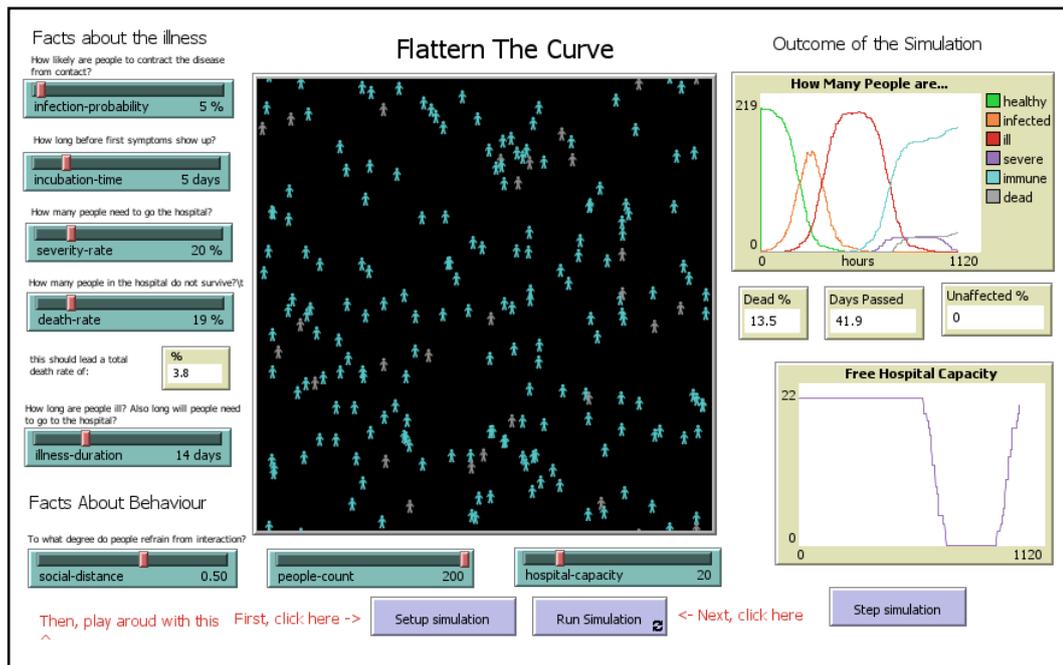
231

Figure 2. Interface simulation by Valdes (2020)

Method

This research is descriptive and qualitative to find the meaning of a phenomenon experienced by the research subject (Moleong, 2017). Phenomena in the spread of RET such as perceptions, motivations, actions, and so on holistically. Furthermore, it is presented in the form of words and language by utilizing natural methods. The data used in this paper is secondary data, whether published or not. Secondary data are generally in the form of historical reports, evidence, or records that have been compiled in archives (documentary data).

The techniques used to collect data in this paper are:
1. Literature study, Literature studies are carried out by looking for relevant data sources and studying them from various literature such as books, journals, and legal documents;
2. Documentary and documentation studies are carried out by reading reports from previous writings and journals related to this writing. In this method, the author moves only the relevant data from the necessary sources or documents;
3. Discussion, data collection using discussing ideas with people who are competent in this matter to solve certain problems related to this paper;
4. Intuitive-Subjective, the opinion of the author is subjectively involved in analyzing the problem under discussion.

Qualitative data is used as the initial conditions of the simulation such as the frequency of occurrence of the RET threat. In addition, the initial conditions are also the behavior of the spread of RET in influencing the community and the factors that are considered the most important by the community. These three things are important in determining the extent to which a person decides to participate in and be affected by RET. Furthermore, a simulation model is made by taking into account the conditions that exist in the real world. After the model design is made,

verification and validation are carried out so that a comparison between the simulation results and the actual situation appears.

Findings and Discussion
Agent-based simulation in the spread of RET
If the spread of RET is allowed, there will be areas whose people are exposed to RET, causing separatism. Furthermore, the spread of RET will also have an impact on the emergence of destructive actions caused by extreme groups to acts of terror that occur in various regions in Indonesia. Thus, the spread of RET is classified as an infectious disease. In addition, research by Nur Amalia and Fathul (2020) reveals that psychology has a very significant role in fighting terrorism and radicalism.

By adopting the Valdes (2020) simulation described earlier, a simulation model with ABM was created on the evaluation of the spread of RET with some adjustments. In addition, a social psychology approach is also used in making an appropriate model for the spread of RET (Smith & Conrey, 2007).

In general, the simulation flow of the spread of RET can be explained as follows:

1. Agent starting condition: normal.
2. At the beginning of the simulation, there is one agent who is exposed to radicalism (the agent can still carry out activities as usual).
3. Randomly depending on the chance of being exposed to radicalism, other normal agents within the infectious radius will be exposed to radicalism.
4. Agents exposed to radicals for a specified duration of time will become extremists. Random chance of being an extremist. In addition, radical agents can return to normal and have immunity against the spread of RET.
5. If there are agents who are extremists while rehabilitation and assistance are not met, then they can become terrorists. However, if there is still room for rehabilitation and assistance, the agent will be treated. The random chance of an extremist agent being a terrorist depends on the level of exposure to terrorism that is determined and a radical agent has a greater chance than a normal agent. In addition, extremist agents may have immunity from exposure to RET spread.

The flow of agent-based simulation in this study can be seen in Figure 3. The simulation was carried out with the help of NetLogo software (Wilensky, 2021). The simulation results observed were the percentage of the number of affected agents, the percentage of the number of agents who died, and the length of time the outbreak lasted. Simulations are carried out repeatedly to see variations in simulation results.
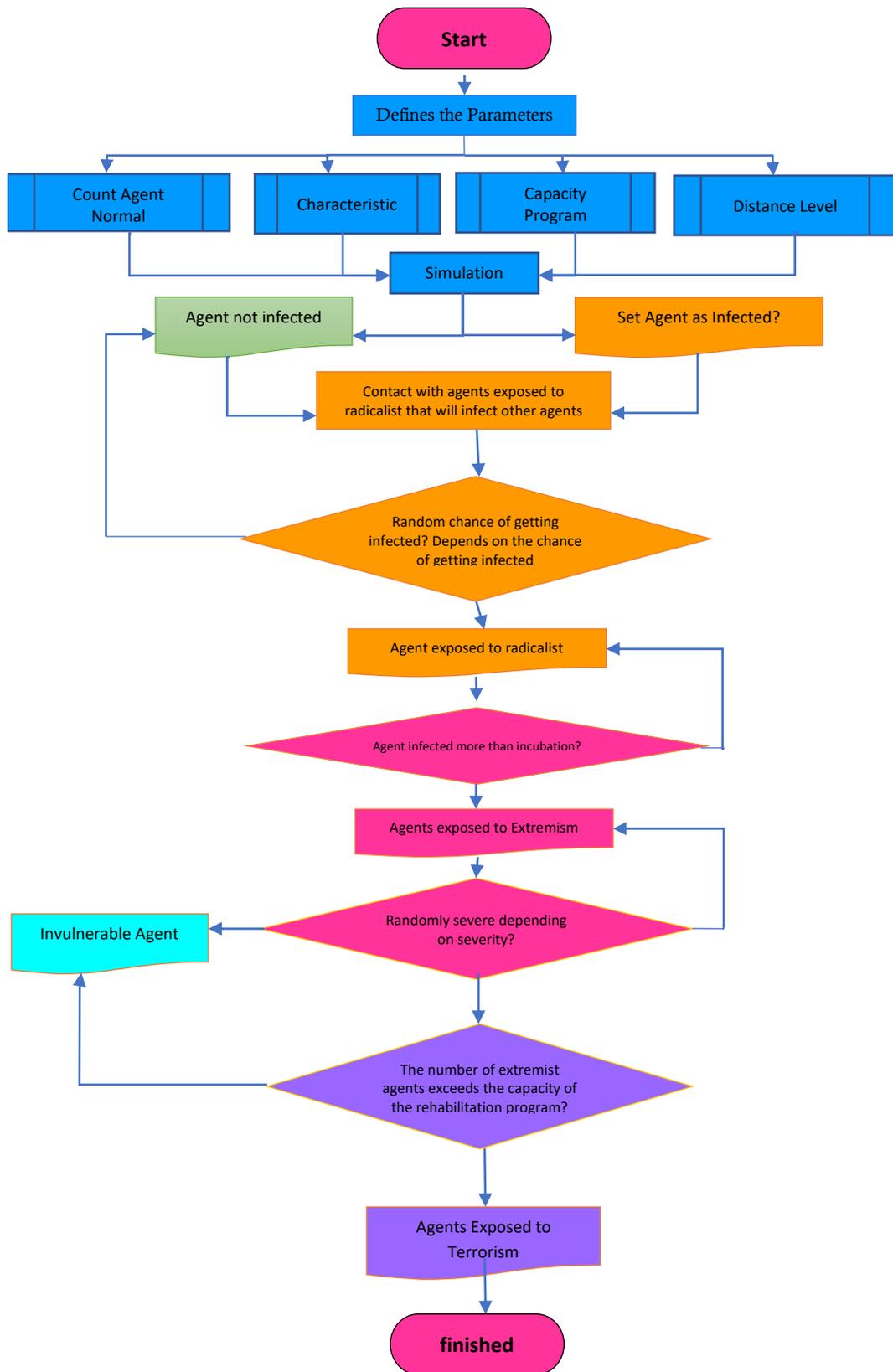
Figure 3. Flowchart simulation spread of RET

There are many approaches used to recruit someone to become a terrorist or extremist. Gerwehr and Sara suggested that one of the traditional ways to do this is to infect by including an agent in a population. When the target population is difficult to reach, 'agents' can be included to pursue recruitment from within, using direct and personal appeal. Social bonds between recruiters and targets can be strengthened by raising complaints, such as marginalization or social frustration (Gerwehr & Daly, 2006; The United Nations, 2017, p. 13). The simulation display is shown in Figure 4.
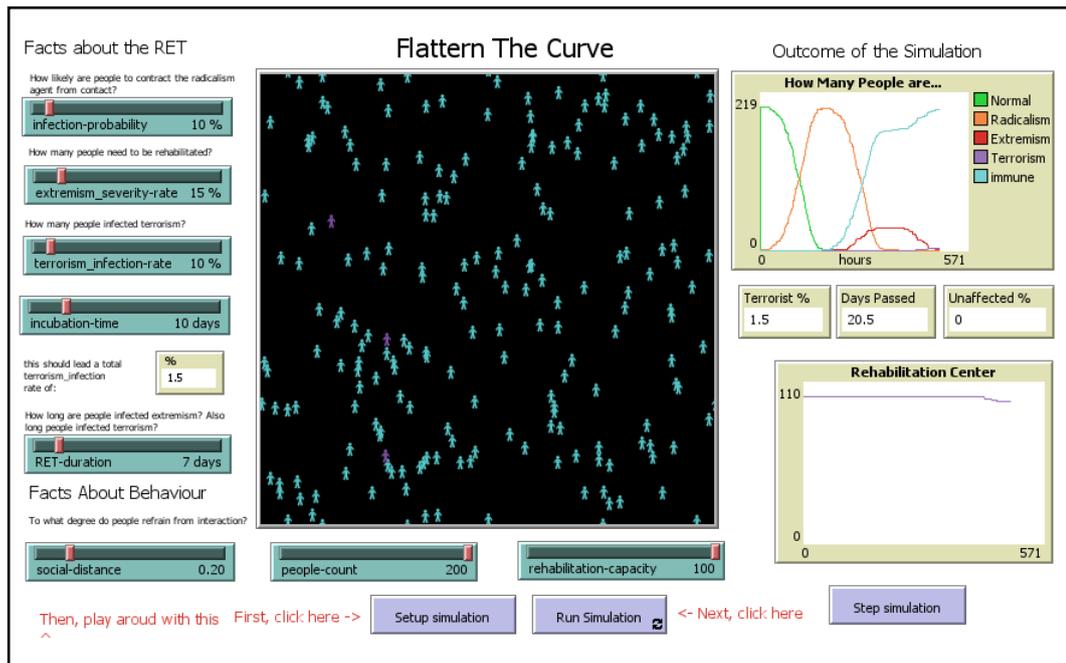

Figure 4. Agent-based simulation results in the spread of RET

The picture above is an agent-based simulation for RET spread with infection parameters of 10%, extremism severity rate of 15%, terrorism infection rate of 10%, incubation time of 10 days, RET duration of 7 days, and capacity rehabilitation center of 100%. The result is 1.5% exposed to terrorism. The percentage value of agents exposed to terrorism depends on the values of the specified parameters. Evaluation of RET spread can be seen on the graph with color indications for each condition of the agent.

Important conditions to prevent the spread of RET

The possibility of infection by radicalism can be estimated based on the resilience of the community's ideology (Lemhannas RI, 2020). It is also closely related to religious knowledge. In addition, socialization and literacy of nationalism and defending the country are important keys to the spread of RET in Indonesia. How likely a person is to be exposed depends on the deradicalization program carried out by the government. The better the deradicalization program, the lower the possibility of transmission of radicalism that will potentially become extremists. In this radical change to extremism also pay attention to the incubation period. This is based on research conducted by the SETARA Institute (2015) that

deradicalization must also be directed at radical groups. If the group is ignored, it is the same as facilitating the incubation of radical groups to become terrorists.

The severity of extremists is based on the assistance and rehabilitation program carried out by the Government (Setiawan, 2021). Rehabilitation is a process carried out in making individuals return to normal. The definition of behavior is concerned with changing the way a person behaves which involves an intervention to eliminate an individual's tendency, desire, or need for something (Robinson & Crow, 2009, p. 2). This requires an ongoing program of people exposed to extremism. Without this program, it will increase the level of distribution of cooperation in the community. In addition, the availability of rehabilitation will have an impact on the development of terrorism in the community.

The simulation takes place randomly by generating several possibilities that are adjusted with interchangeable parameters. From the simulation, it was found that the basic importance of taking action is to reduce the possibility of exposure through increasing several literacy and socialization programs related to religion, a sense of nationalism, and defending the country to various levels of society to provide resilience or immunity to recruitment from radicalist agents. The absence of a deradicalization program is an incubation period for radical agents who will become extremists and even terrorists (Ismed, 2021).

The severity of extremism must be minimized through the legal process to provide a deterrent effect for extremists. The provision of rehabilitation centers is also important for extremist actors so that they do not become terrorists. In addition, the percentage level of exposure to terrorism in the community must be anticipated, for example through intelligence activities, forming public opinion about the dangers of terrorism, and implementing equitable development in various regions in Indonesia. The implementation of this development is closely related to justice which is an important key in the emergence of terrorism.

Evaluation of the spread of RET in strengthening Indonesia's defense

RET is defined as a non-military threat to be aware of (Indrawan and Efriza, 2017). Several events in Indonesia continue to live the life of the nation and state. This is a must for the government to be proactive in dealing with the spread of RET. By using a defense approach, the threat of RET spread is a non-military threat that will be handled with non-military defense.

Evaluation of the spread of RET is carried out in achieving a strong non-military defense. The emergence of separatism seems to be a problem that has not been resolved until now. For example, terrorism in Papua is still a domestic problem in Indonesia. Acts of terror carried out by the KKB caused widespread casualties, damaged public facilities, caused anxiety, and threatened the safety and security of the people of Papua and West Papua (Kurnianingrum, 2021). Another thing that comes to the fore is that religious extremism, be it Islam, Jews, Protestants, Catholics, Hindus, or Buddhists, has the phenomenon of extremism in its adherents. Even the Buddha, who is not extreme by many, is now also associated with extremism as happened with his Rohingya ethnicity in Burma (Hasyim, 2017). This needs to be a common thought about reducing the spread of RET in various parts of the country.

Program evaluation is the process of systematically gathering empirical data and contextual information about an intervention program—specifically answers to what, who, how, whether, and why questions that will assist in assessing a program's planning, implementation, and/or effectiveness (Chen, 2014). In another word, Evaluating the programs means reviewing the programs that have been carried out by the government in dealing with the threat of the spread of RET. The program to prevent the spread of RET with proactive methods such as increasing religious understanding, socialization, and literacy of nationalism and defending the state, as well as community empowerment, must continue to be improved (Yasa, Hamad, Syauqillah, and Puspitasari, 2022). The reason is that all forms of radicalism, extremism, and terrorism greatly interfere with state sovereignty and hinder the achievement of the goals of the Indonesian state and nation. In other words, a strong non-military defense will have implications for the continuous development and achievement of Indonesia's goals.

Conclusion

In this article, several conclusions can be drawn, namely:
1. Agent-based simulation in preventing the spread of RET is carried out with the help of NetLogo software. Flowcharts are used to create a suitable model for preventing and anticipating the spread of RET.
2. In this study, an agent-based simulation was carried out to see the effect of the incubation period, the possibility of being exposed to radicalism, the severity of extremism, the availability of rehabilitation centers, and the level of influence of terrorism on the spread of RET. The simulation results show that these five parameters greatly affect the percentage of agents exposed to radicalism, extremism, and terrorism. The simulation results provide empirical evidence on matters that need to be considered by policymakers and the public by defining the possibility of being exposed to radicalism, the severity of extremism, and the level of influence of terrorism. These three things are defined as increasing religious knowledge in the community, literacy on nationalism, and defending the state and community empowerment through economic activities in improving people's welfare.
3. Evaluation of the spread of RET is very closely related to improving Indonesia's defense, especially in the sphere of non-military defense. RET is very influential in achieving the goals of the Indonesian nation and state. The fewer spread of RET the better Indonesia's defense will be.

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