

MAINTAINING NATION SOLIDITIES THROUGH RENEWABLE ENERGY MANAGEMENT BASED ON MUTUAL COOPERATION

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Abstract - The community is one of the potential sources for building solidity, strength and defense for the Indonesian people. However, building on the condition of the Indonesian nation's solidity in the midst of current globalization has many challenges. One of them is by trying to condition people who are united in maintaining the solidity of the nation. The research method in this study used literature studies and previous research observation of the author. The result is an analysis of the role of community solidity in managing renewable energy towards energy independence supporting national defense forces, through the implementation of basic energy self-management including: (1) awareness of the importance of citizen solidity in managing renewable energy through solid community participation in a community so as not only normative appeals, but there needs to be clear regulations regarding the active involvement of the community in supporting the 23% renewable energy mix program in 2025; (2) the community becomes the driving force of solidarity in energy management that has succeeded in facilitating other communities in providing energy independently and contributing to the growth of people's economy in supporting national defense.

Keywords: Community Solidity, Energy, Self-Management

INTRODUCTION

A strong nation is a nation that has people who are unified, strong as a supporting component of the nation's solidity. But amid the current flow of globalization, the potential of the people as a strength of national solidarity needs to be optimized to make Indonesia a solid nation.

Indonesia with its history is a country with strong solidarity when struggling for its independence against colonialism during colonialism era up to the era where

we maintain the independence of the nation and the state from other countries' military threats. Indonesian people at that time were ready to sacrifice their lives and properties, to work hard, be willing to suffer, to maintain solidity, and unity of the nation¹.

However, the beginning of the era of reform order faced by Indonesia with the current challenges of globalization, made things go awry, and weakened the sense of solidarity of the Indonesian people.

¹ Faisal Affif, *Membangun Solidaritas Bangsa di Tengah Arus Globalisasi* (Indonesian), (Jakarta: Bina Nusantara University, 2013), p. 2

The ease of access to information media and advances in communication technology, such as the role of internet networks that have eliminated world boundaries in communicating and accessing information, facilitate the influx of foreign cultures, which actually accelerates the weakness of the nation's solidity and degradation. Indonesia's young generation is less aware of the understanding of the importance of the historical inheritance. Especially understanding the meaning, breath and ideals of our founding father in establishing the State of Indonesia.² Indonesia needs to revive the golden age of its past history including by maintaining the solidity of the nation through the cohesiveness and strength of its people.

To awaken the solidity of the Nation in a strong collective bond, cohesiveness efforts among the citizens who are members of a group of people is very necessary to maintain the spirit of all the Indonesian people as a great nation, united to form all the forces using our Natural Resources, including land, water and energy independently to realize

energy security to support national defense.

This state defense will function to realize the solidarity of the nation, namely a national unity that is able to protect the sovereignty of the country, the integrity of the region, and the safety of the nation from all forms of threats. The national defense system is essentially all universal defense efforts, which involve all citizens of the state, region and other National Resources and it is prepared in advance by the government and carried out in a total, integrated, directed, and continuing manner to uphold national sovereignty, territorial integrity and the safety of all nations from all threats³.

Indonesia has natural resources in the form of abundant renewable energy sources that can be utilized and managed by the community with unity and strength of solidity in supporting defense forces. Renewable Energy is one of Indonesia's potential resources to meet the main needs of its people in the current era of globalization, such as geothermal energy, sea, sun, wind, hydro (water) and other energy sources as part of the abundance of natural resources of Indonesia, such as

² *Ibid*, p.3.

³ President of the Republic of Indonesia I, Law No. 3 of 2002 concerning National Defense, (Jakarta: State Secretariat, 2015), p 1.

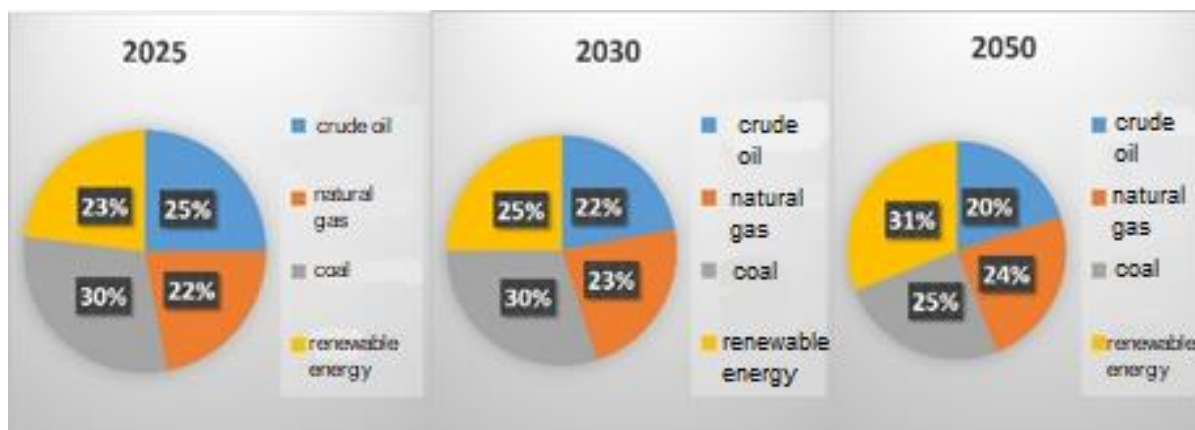


Figure 1. Energy Mix in National Energy Policy

Source: National Energy Council, Indonesian Energy Security, (Jakarta: Secretary General of National Energy Council, 2015), p. 9.

biomass energy (biogas, biodiesel, bioethanol), and briquettes.

Renewable Energy is targeted to reach 23% of its energy mix target (figure 1) in 2025, and target of 25% Renewable Energy in 2030 and 31% Renewable Energy in 2050⁴ so that it further minimizes the use of fossil energy such as oil, coal and natural gas which the management and production is intended for domestic needs.

However, Indonesia's energy conditions show that the utilization of renewable energy is still low, namely 5.3% in 2013, 6.4% in 2014, 6.7% in 2015, 7.7% in 2016, 8.43% in 2017 and target up to 9% in 2018.⁵ One of the reasons is that local

resources such as the potential of the local communities are still minimally involved in self-management of renewable energy, including planning, construction, development, maintenance of renewable energy facilities. Local people are only passive players and are merely recipients of government projects so that many renewable energy projects are stalled and only last for a period of time. For example, in the 2017 Indonesian Supreme Audit Institution (BPK) report, there were 142 renewable energy projects worth 1.17 Trillion which were stalled from 2011-2017.

This condition becomes a challenge in the development of sustainable

⁴ National Energy Council (DEN), *Ketahanan Energi Indonesia* (Indonesian), (Jakarta: General Secretariat of National Energy Council, 2015), p.9.

⁵ Lidya Julita Sembiring, "Kementerian ESDM Targetkan Bauran Energi Terbarukan hingga 9%

di 2018, <http://economy.okeone.com/read/2017/12/12/320/1829342/kementerian-esdm-targetkan-bauran-energi-terbarukan-hingga-9-di-2018#lastread/>, accessed on 1 February 2019.

renewable energy to realize energy support for national defense.

In addition, the Indonesian Human Development Index (HDI) is at 70.81% in 2017 which indicates that Indonesian people have good quality for their human development potential, including being involved in self-management cooperation in overcoming various energy problems faced in their region.⁶.

Therefore, opportunities in the effort to increase national solidarity can be realized through the empowerment of Indonesian local communities in their local energy self-management, so that the noble values of the Indonesian people such as the mutual cooperation culture (Indonesian: gotong royong) are firmly embedded in the Indonesian territory as part of maintaining the nation's solidity. Therefore, the village as part of the Indonesian territory that still has a community that is unique with its mutual cooperation culture should be able to guide the implementation of energy self-management through community participation in developing renewable energy in community self-cooperation

systems in cooperation to maintain the nation's solidity in realizing the energy mix, mainly the use of Renewable Energy of 23% in 2025. Therefore, in this study, the solution to maintain the nation's solidarity is by implementing self-management of community-based renewable energy as a driver, booster and implementer of all potential renewable energy programs to be utilized from the region's energy potential.

RESEARCH METHODS

The type of this research is literature review, which is a series of studies relating to library data collection methods, or research whose research objects are taken from previous research observations through various library information (books, encyclopedias, scientific journals, newspapers, magazines and documents) which critically reviews the knowledge, ideas, or findings contained in the body of academic-oriented literature, and formulates its theoretical and methodological contributions to specific topics so that they are classified into review article.

⁶ Statistics Indonesia (BPS), "Indeks Pembangunan Manusia Indonesia" (Indonesian), <https://www.bs.go.id/ressrelease/2018/04/16/1535/indeks-embangunan-manusia--im--indonesia->

<ada-tahun-2017-mencaai-70-81--kualitas-kesehatan--endidikan--dan-emenuhan-kebutuhan-hidu-masyarakat-indonesia-mengalami-eningkatan.html>, accessed on February 1, 2019.

This research used secondary data. Secondary data are supporting documents from books and journals as well as relevant websites in this research. The literature review stages are carried out as follows ⁷:

1. Organize, namely organizing literatures to be reviewed. The reviewed literatures are relevant/in accordance with the theme raised. The stages in organizing literature are looking for ideas, general goals, and conclusions from the literatures by reading abstracts, several introductory paragraphs, and conclusions, as well as classifying literature based on certain categories;
2. Synthesize; namely to unify the results of the organization of literature into a summary so that it becomes a unified whole, by looking for interrelationships between the literatures;
3. Identify; namely identifying the issues of controversy in the literature. The issue of controversy in question is an issue that is considered very important to be analyzed, in order to get an interesting article to read;
4. Formulate; namely formulating findings that require further research.

⁷ Syaodih, Nana, *Metode Penelitian* (Indonesian), (Bandung: T. Remaja Rosdakarya, 2009), p. 5.

The data analysis techniques performed were analyzed by descriptive analysis method. Descriptive analysis method is conducted by describing the facts which are then followed by analysis, not merely describing, but also providing sufficient understanding and explanation⁸.

RESULTS & DISCUSSIONS

Solidity of the Indonesian Nation from Time to Time

a) National Solidarity Before Independence

The solidarity of the Indonesian people in its history was greatly strengthened and expressed at the beginning of Indonesian independence, which was demonstrated by our freedom fighters, who were able to foment the spirit to counter colonialism to the extent of the crystallization of the vision of Indonesia through the oath of youth towards the culmination of the proclaimed Indonesian state on August 17, 1945.

Aside, the struggle of the Indonesian people after independence was also obtained was not easy, there were still challenges and threats to defend Indonesia's independence from invaders who tried to win Indonesian

⁸ *Ibid*, p. 3.

independence. As Indonesian people who consist of and are blessed with a variety of ethnicities, the presence of a national spirit is important to create harmony and synergy in maintaining the independence that has just been seized. The conviction of Bung Karno, the founding father, would be the importance of maintaining the solidity of the Indonesian nation while still upholding the national spirit, manifested by strengthening the Pancasila as a state ideology reflected in his optimistic expression of the old order: "*samen bundeling van alle krachten van de natie*" , which means being together with all national strength⁹.

b) Solidity of the Nation of the New Order Era

Although Indonesia as a young country had succeeded in bringing forth the Pancasila ideology that was accepted by the majority of the nation's elites, but what economic system will be put forward to support the ideology had not been thought of. As the time went on, since the independence did not appear to have taken a serious step in

managing economic life until it resulted in the era of the old order, a decline in the level of the country's economy and the welfare of the Indonesian people until the improvement of the Indonesian economy began again in the New Order era ¹⁰ . Indonesia transformed from a country with economic limitations in the Old Order era, then tried to align itself as one of the countries that continued to catch up their economy backward.

However, the spirit of the nationality of the New Order era experienced challenges with the degradation of Pancasila values until the end of 1998. This was due to the single interpretation of escalated upgrading of the Guidelines for Instilling and Applying Pancasila (P4) held by the Board for Developing Education and the Implementation of Guidelines for Instilling and Applying Pancasila (BP7) and Program of Instilling and Applying Pancasila (P4) were just mere formality. Pancasila began to lose its sensitivity and spirituality of history which resulted in the weakening of the solidity of the

⁹ Nurcholis Madjid, *Islam, Kemandirian dan Kelindonesiaan* (Indonesian), (Bandung: Mizan, 1998), p. 78.

¹⁰ Faisal Affif, *op.cit*, p. 6

Indonesian people¹¹.

c) Solidarity of the Reformation Era

The reform era came after the end of the new order in 1998, when Indonesia also experienced a multidimensional crisis in all aspects and was increasingly challenged with the flow of globalization that was increasingly happening, so that everything became a big challenge in increasing the sense of solidarity of the Indonesian nation. Such a big threat to the solidity of the Indonesian nation is based on the problems of religious sentiment and regional sentiment in the midst of society, lack of attention to local culture, the use of regional potential by foreign capital.¹² It is time for the reform era not to keep repeating mistakes like what the old order and the new order did..

A multidimensional development strategy that focuses on the solidity of the Indonesian nation should be formulated in the form of a shared platform by all elements of the younger generation, including those who are active in government and outside, both those who favor mainstream views, religious, secular, agree to sit with their

minds and open heart, to formulate the platform.

As a consequence, a heartfelt commitment should be established, that whoever rules, whichever party wins elections in this country, must obey to run the platform for the sake of national solidarity so that one-dimensional development experimentation which is solely nationality-driven or market-driven will not repeat, which has been proven to inherit the image of failure of the old order and the new order, that it should be prevented from continuing in this era of reformation¹³.

The desire to find solutions in the current era and towards the aspirations of the future should be conducted by collaborating among national elements, as the most important one in developing platform excellence in the formulation of multidimensional development strategies that proportionally perceive aspirational dialectics of national nationalism and global markets, for the sake of the solidity of the majority of Indonesian people.

Good communication among components of the nation is very important in creating safe conditions in

¹¹ *Ibid*, p. 7.

¹² *Ibid*, p. 9.

¹³ *Ibid*, p. 14.

maintaining the solidity of the nation. This can be realized by familiarizing people with mutual respect and caring. The many differences and problems that arise due to the dynamics of current developments require that all parties must be more mature in attitude, and not just follow personal will without regard to and also consider the public interest. We must ensure that no one feels aggrieved by our statements and actions to the public by reflecting behavior that reflects national values.

National values include the values contained in Pancasila, the 1945 Constitution, the Republic of Indonesia and the Unity in Diversity (*Bhineka Tunggal Ika*). Pancasila as the basic foundation and fundamental basis for the administration of the Republic of Indonesia. Pancasila listed in the Preamble of the 1945 Constitution, which contains five (5) precepts which in its definition contain five fundamental values. The basic values of Pancasila are the values of Belief in the One and Only God, Fair and Civilized Humanity Value, Indonesian Unity Value, People's Value which is led by wisdom in

deliberation/representation, and the value of social justice for all Indonesian people¹⁴.

The development of national character as a systemic collective effort of a nation-state to realize the life of nation and state in accordance with the basis and ideology, constitution, state direction, and collective potential in the context of national, regional and global life that is civilized to form a solid, resilient nation competitive, noble, moral, politicized, collaborative, patriotic, dynamic, cultured, and science and technology-oriented based on Pancasila and imbued with faith and piety to the Almighty God. This situation must also be strengthened by the ability of human resources to defend themselves from all threats both from inside and outside.

In addition, the Government of Indonesia has established a Presidential Work Unit for Pancasila Ideology Development (UKPPIP) in collaboration with the legislative (MPR) and the Ministry of Home Affairs to disseminate 4 pillars in all regions of Indonesia. The MPR also carried out socialization of Pancasila to cadres of temporary political parties at the

¹⁴ Ryamizard Ryacudu, *Buku Putih Pertahanan Indonesia* (Indonesian), (Jakarta: Ministry of Defense of Republic Indonesia, 2015), p 48.

Ministry of Home Affairs (Kemendagri) focusing on bureaucratic socialization so that it could be coordinated with all Indonesian government bureaucracies.

It should be that Indonesia is currently focusing on building the nation's solidity through National Resources in the form of Human Resources such as active community involvement and Natural Resources such as sources of energy raw materials that can be beneficial and manageable. Energy as part of Natural Resources, with its potential contained in the earth, water, and aerospace in its original form, can be used for the sake of national defense in the form of solidity of the nation.

National Defense

The national defense system involves all components of national defense, consisting of the main components, reserve components, and supporting components. The main component is the Indonesian Armed Forces, which are ready to be used to carry out defense tasks. The reserve component is National Resources that have been prepared to be mobilized through mobilization to enlarge and strengthen the strength and capability of

the main components. The supporting component is National Resources which can be used to increase the strength and capability of the main components and reserve components¹⁵.

The supporting component is a forum for the community to utilize natural resources, artificial resources and infrastructure facilities that are prepared early to strengthen the main components and reserves in national defense.¹⁶. The reserve component as part of National Resources needs to be built, maintained and developed so that its readiness can be realized so that it can be used to increase the strength and capability of the main components. Looking at the conditions of readiness, the reserve component currently faces the nature of the threat as an impact of the development of a rapidly changing strategic environment. Therefore, the realization of the reserve component, one of which can synergize Human Resources, Natural Resources, Artificial Resources and facilities in the form of national solidarity, including the use of Natural Resources such as local energy potential by the local community in meeting their energy needs.

The component of national defense

¹⁵ Sutrimo., *o.cit*, p. 19.

¹⁶ *Ibid*, p. 17.

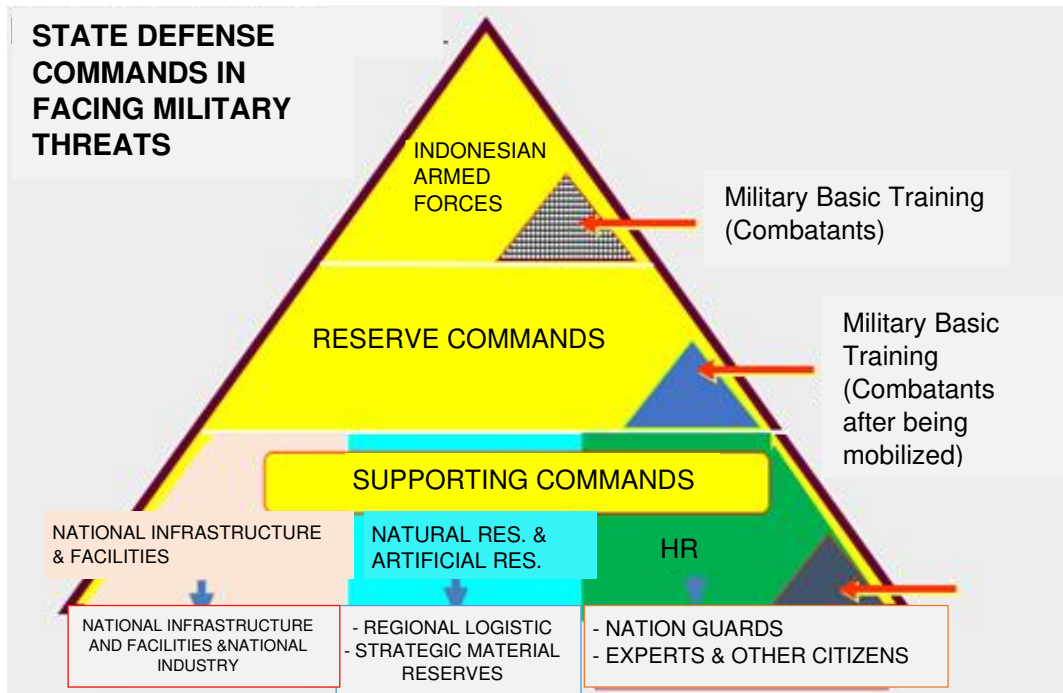


Figure 2. Component of National Defense in Facing Threats
 Source: Sutrimo, “Implementasi Peran Komponen Cadangan dan Komponen Pendukung” (Indonesian), (Bogor: Defense University, 2017), p. 16.

in facing threats is as shown in Figure 2.¹⁷ Methods section describes the steps followed in the execution of the study and also provides a brief justification for the research methods used. It should contain enough detail to enable the reader to evaluate the appropriateness of your methods and the reliability and validity of your findings. Furthermore, the information should enable experienced researchers to replicate your study.

The Concept of Self-Management of Community-Based Renewable Energy Development

a) The Concept of Self-Management

Based on Presidential Regulation No. 54/2010, self-management is the procurement of goods/services with planned works, carried out and supervised by the parties who carry out their work themselves¹⁸. Self-management has been implemented in

¹⁷ President of the Republic of Indonesia., o.cit, p. 1.
¹⁸ President of the Republic of Indonesia. Presidential Regulation of the Republic of

Indonesia Number 54 of 2010 concerning the Procurement of Government Goods/Services, (Jakarta: Secretariat of Republic of Indonesia, 2010), p. 28.

rural areas to independently develop their own villages. The village government forms a village activity implementation team that actively engages the community social groups, such as the creation of implementation schedules, work plans, financing and plans of required technical specifications, as well as the availability of raw materials that have potentials to be developed in these villages¹⁹.

Self-management of renewable energy development can be implemented through active community participation in the development of renewable energy in terms of planning, management and maintenance so as to support sustainable development. The sustainable development is community based ²⁰ through community empowerment grouped as an important element in village communities through the application of participatory approaches, which are believed to be more able to approach the community, because from the

beginning the community process is actively involved and becomes part of making various decisions.²¹.

b) Community Involvement

Some activities that use this approach are related to the determination of local community team groups, the establishment of implementation of renewable energy development, the determination of regional locations that involve all parties taking into account the sustainability aspects through the development of Human Resources (HR) and the environment. Such as monitoring the development of institutionalization of community organizations that have been developed so that they can continue to play a role in community empowerment. Instruments of the rules of the game, governance and other collective agreements and entrepreneurial vision are one of the main parts that can guarantee the sustainability of community organizations. And, the role of the actors / actors who play a role so that

¹⁹ Sartono Kartodirdjo Mubyarto, *Pembangunan Pedesaan di Indonesia* (Indonesian), (Yogyakarta: Liberty, 1988), p. 36.

²⁰ Ditjen EBTKE. "Patriot Energi. May 2 edition (Indonesian)". (Jakarta: Ministry of Energy and Mineral Resources., 2016)

²¹ Tewu Mikael, *Peranan Sumber Daya Manusia Dalam Meningkatkan Aktivitas Kelompok Tani Di Desa Tember* (Indonesian). Jakarta: Jurnal Acta Darna Vol IV No 3, 2015), p. 5.

the organization can run and budget policy is another supporting element to ensure sustainability²².

c) Self-Management of Community-Based Renewable Energy Development

The importance of developing renewable energy must be in line with the interests of social development and environmental preservation. The key to success is through implementing programs that increase community capacity and participation in social change that can provide economic benefits (creation of productive employment, poverty alleviation), social benefits (increasing environmental awareness in social integration), and the environment benefits (efficient use of natural resources)²³.

In developing community-based renewable energy as a community, the aspects that influence it include technical aspects, financing aspects, social aspects²⁴:

1) Technical aspects: including operations and infrastructure that affect the development of

renewable energy, such as system conditions that are in accordance with the natural conditions of the region (topography). Natural conditions that determine the potential of renewable energy available such as areas that have high biomass sources, adequate sunlight intensity, and potential water sources. An environment that is maintained and maintained will guarantee the sustainability of sources of potential renewable energy

2) Financing aspects, including financing needed during the development of renewable energy, such as research of potential Renewable Energy Sources, development of supporting infrastructure, training of Human Resources involved in the development, maintenance and preparation of new investments for the development of renewable energy in the future. The funding needed can come from developer investment, institutional community

²² Kemala. *Meningkatkan roduktivitas Masyarakat edesaan Melalui Energi Terbarukan* (Indonesian), (Yogyakarta: Lakesdam-BNU, 2017), p. xii.

²³ *Ibid.*, p. 11.

²⁴ IMIDA. *Pedoman Studi Kelayakan Komerehensif Berkelanjutan* (Indonesian), (Jakarta: Directorate General of Electricity and Energy Utilization, Ministry of Energy and Mineral Resources, 2009), p. 5.

service grants, as well as village development funds owned by the local government as well as voluntary cooperative contributions of renewable energy communities that are affordable to the community so as to support the community's economy.

3) Human resource aspects, including community assistance, community participatory level, level of education, increased social welfare.

a) community assistance; communities in implementing renewable energy programs must always be encouraged and developed in stages, continuously and sustainably. The soul of community participation is the spirit of social solidarity, namely social relations which are always based on feelings of togetherness in terms of morals, beliefs and ideals. Community participation from the beginning of the program will further guarantee the success and sustainability of the program. Community participation needs to be done

in the right approach and the project mechanism that supports participatory patterns. It needs careful planning and process guidance that is appropriate to the local context;

b) participatory community; community participation in a renewable energy program, including aspects of project planning, implementation and monitoring. The success of a renewable energy project is largely determined by community participation in decision making, implementation, resource mobilization, shared use and evaluation;

c) level of education; Community understanding of education will influence the ability of the community to understand the management of renewable energy such as Micro Hydro Power Plant (MHP), solar cells. A good quality of education will have a major influence on improving the quality of Human Resources. Education in an organization is a process

of developing capabilities in the direction desired by the organization. Training is part of an educational process, which aims to improve the abilities or special skills of a person or group of people;

- d) improving social welfare; Social welfare conditions are created by the compromise of three elements, namely the extent to which social problems are regulated, the extent to which social needs are met and the extent to which opportunities for improving living standards can be provided. All levels of society have what are called social problems but depend on how they manage the problem. The social conditions of the community influence the self-management of renewable energy development which describes the pattern of life of the community. Humans as resources for an organization do not have the same characteristics as natural and financial resources. Human Resources as God's creation

are complex creatures and body and soul integration, which cannot be seen similar as the other two sources in business activities. An organization must have a competitive Human Resources, so that it does not experience setbacks.

- 4) Management and institutional aspects, including institutions for managing renewable energy in the form of organizations and management that are formed based on village consultations, associations, village unit cooperatives and other existing and legal entities. The goal is to obtain institutional support and institutional oversight from internal and external, such as stakeholders. The main things to do are:
- a) Organizational formation, because management's success must be preceded by the organization's success;
 - b) A management system must be clear and this includes the task of each person appointed to be responsible in the organization, the system of

relations or communication between the people responsible, and the decision-making system of the organization such as voting to resolve problems;

- c) The financial system must be built including a tariff system, collection of energy costs according to the tariff system, accounting, financial management methods;
- d) Rules and regulations will be needed to put each of the above mentioned in the form of a law as a rule and or order. All appointed individuals and members of the organization must comply with these regulations.

Energy management activities can be started with self-management through community involvement and participation as a component of human resources in managing natural resources in the form of energy potential that is owned by the local area in an organized manner and using self-management guidelines for energy development.

The optimal model for self-management of renewable energy development can be conducted by integrating technical aspects, human resources, institutional management and funding more optimally. Optimization of self-management of renewable energy development such as briquettes, biogas and solar power can be carried out in accordance with energy management theory (Figure 3))²⁵ through the process of village planning and development (musrenbang), related to the energy sector as can be seen in Figure 3.

- 1) Energy plan includes: (a) begins with planning what energy priorities will be developed and who is responsible for implementing the renewable energy development by integrating implementation responsibilities in the community, academics, developers, support of regional government and the central government; (b) identify the situation of people's energy needs. The importance of developing renewable energy must be in line with the interests of social development and environmental preservation. The key to success is through

²⁵ PT. Energy Management Indonesia (Persero), *Pengantar Manajemen Energi* (Indonesian), (Jakarta: Ministry of Industry, 2011), p. 11.

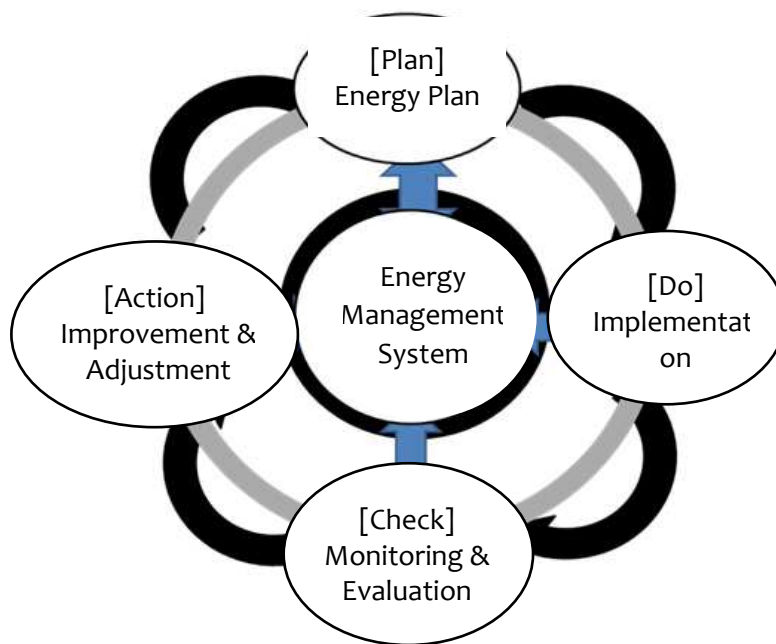


Figure 3. Energy Management System

Source: PT. Energy Management Indonesia (Persero), Pengantar Manajemen Energi (Indonesian), (Jakarta: Kementerian Perindustrian, 2011), p. 11.

implementing programs that increase community capacity and participation in social change that can provide economic benefits (creation of productive employment, poverty alleviation), social (increasing knowledge of environmental awareness in social integration), and the environment (efficient use of natural resources); (c) integrating the needs of funds needed on a priority scale that supports the procurement of technology that facilitates the implementation of renewable energy development; (d) integrating organizations that have been formed between central and regional

governments up to energy foundations and the role of academics and local village facilitators as facilitators;

- 2) Implementation (Do) includes: (a) Program Preparation consisting of: (1) Program targets to be implemented Organizational structure and personnel needed; (2) Program implementation consists of: (a) Increasing awareness of optimizing and managing the use of energy sources effectively and efficiently among related parties (central-regional government, energy developers, academics and community members); (b) Conducting periodic

- training to improve program development competencies to local communities who will directly play a role in the implementation of the program; (c) Conducting pilot projects of the programs that have been set; (d) Conducting direction, supervision and monitoring of pilot projects in collaboration with relevant agencies; (e) Preparing supporting equipment and technology;
- 3) Monitoring and Evaluation (Check), covers activities such as: (a) effective and efficient energy management.; (b) fostering the entrepreneurial spirit of the development of Renewable Energy from potential resources in place;
 - 4) Improvement and Adjustment (Action), consisting of: (a) Priority grade from the results of monitoring and treatment; (b) The focus of monitoring and analysis is the implementation of fulfilling sufficient energy needs for areas that need the energy.

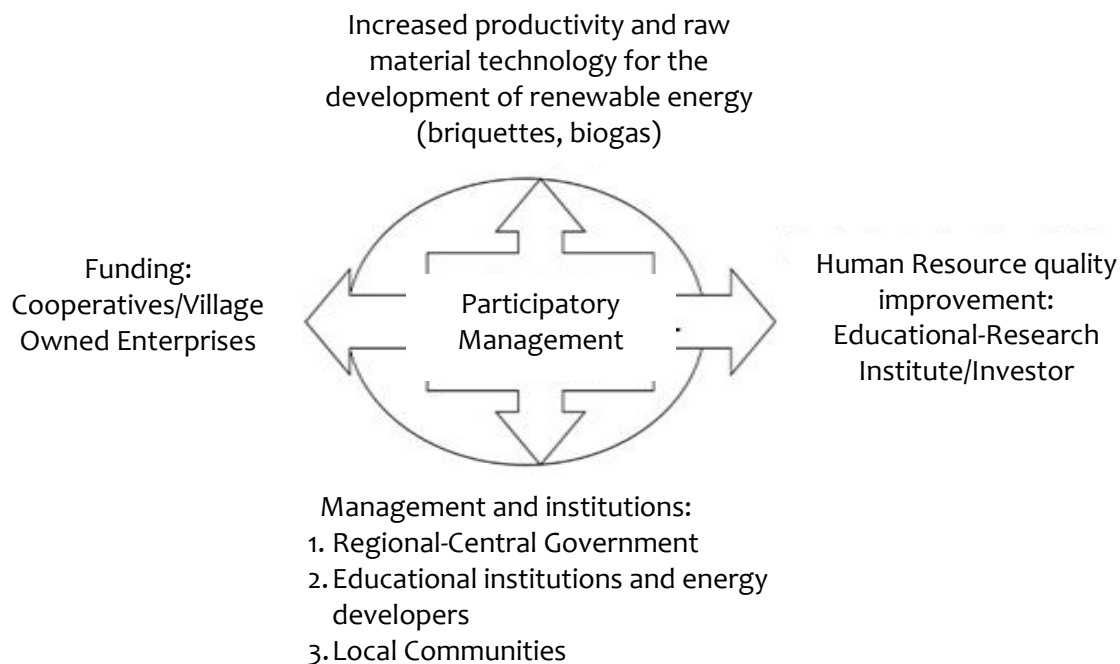
The success of the renewable energy program will depend on the extent to which the government's good will is supported by the central government, the private sector, and the community in an area. This commitment is expected to be

realized in the form of policies, comprehensive and integrated planning, and implementation, as well as monitoring and evaluating programs consistently and responsibly (all out) in the renewable energy development from agricultural and livestock waste as shown in Figure 4.

Methods section describes the steps followed in the execution of the study and also provides a brief justification for the research methods used. It should contain enough detail to enable the reader to evaluate the appropriateness of your methods and the reliability and validity of your findings. Furthermore, the information should enable experienced researchers to replicate your study.

Implementation of Maintaining Nation Solidity through Community-Based Energy Management

One example of the solidity of the Indonesian community in managing the development of renewable energy can be seen from the geographical area that shapes the pattern of life of the people, such as: (1) the Sukaati village community, Singasari Village, Jonggol District, which lives in agricultural and animal husbandry areas that use agricultural waste such as rice straw to be a source of briquettes and cattle farm waste as biogas; (2) the people



Energy Sustainability

Figure 4. Optimization Model of Self-Management of Renewable Energy Development

Source: Khotimah, Khusnul, Analisis Swakelola Pengembangan Energi Terbarukan (Indonesian), (Bogor: Defense University, 2018),

of Bangun Sari Village, Negeri Kato District, Pesawaran District, Lampung Province who used tapioca flour from the remaining production of tapioca flour from cassava and corn farms; (3) the people of Krueng Kala Village, Aceh Besar District, Aceh Province, with their lives building micro-hydro power plants (MHP) from Suhom Waterfall, after the 2004 tsunami.

The Sukaati village community, Singasari Village, Jonggol District, manages the potential of the region which

is an area of agriculture and animal husbandry as his livelihood. Agricultural waste used to be left alone without being used economically by the community. This condition is an opportunity for the utilization of waste as a more economical briquette product that can be carried out self-managed by the community, carried out by researchers with a team of academics in the Department of Energy Security, who have approached the community in farmer groups, livestock groups and home industries. (home

industry) by disseminating programs that will be developed.

Self-management activities began with the collection of rice straw material as a residual rice crop by the community, dried and cut into small sizes to do the process of rice straw briquetting which is heating in a closed container.²⁶ The self-management was followed by conventional briquette making in mutual cooperation by residents to make briquettes to meet energy needs.²⁷

The briquettes that have been carried out by the previous process are then mixed with glue to form a dough in order to be transformed into briquettes. The resulting briquettes are then dried manually under the sun for a long time depending on the weather conditions and the length of the sun's rays.²⁸

The community has understood the management of renewable energy from the potential of rice straw waste to briquettes that can implement energy self-management (Figure 8) in optimizing the potential of available local Energy Resources. The involvement of the

community as an empowering, inspiring, evocative and revitalizer of the local wisdom culture will result in the transformation of fossil energy-based management paradigms to non-fossils, such as the use of 54.89 tons/year briquettes that can spend 20 kg of briquettes/month so as to reduce dependence on 3 kg LPG gas which spend 3-4 tubes/month while 3 kg LPG costs Rp. 25,000/tube, as well as the use of firewood in their household needs with 10-15 kg of wood/month, with electrical energy requirements of around Rp.100,000/month from the total of 247 households in the village of Sukaati.²⁹

In other areas such as Bangun Sari Village, Negeri Katon District, located in Pesawaran District, Lampung Province also uses tapioca waste to become biogas. The community of Bangun Sari Village consists of farmers. Agricultural commodities from this sub-district include cassava and corn³⁰.

In this sub-district there is a semi-finished food processing mill such as processing tapioca flour which produces

²⁶ Khotimah, Khusnul, *Analisis Swakelola Pengembangan Energi Terbarukan* (Indonesian), (Bogor: Defense University, 2018), p. 69.

²⁷ *Ibid*, p. 70.

²⁸ *Ibid*,

²⁹ *Ibid.*, p. 6.

³⁰ Energy and Mineral Resources Research and Development Agency, *Bergerak dengan Energi Terbarukan* (Indonesian), (Jakarta: Energy and Mineral Resources Research and Development Agency, 2014), p. 34.

large enough waste water reaching 4-5 cubic meters per ton of cassava every day so that this waste water produces an unpleasant odor.³¹

In 2008, the Ministry of Energy and Mineral Resources (ESDM) and Lampung State University (Unila) conducted a research to convert tapioca processing waste into biogas. Biogas results of this study initially only to supply biogas residents around the factory for cooking purposes.

The biogas manufacturing process was carried out jointly by the community by adopting the Cover Lagoon Anaerobic Reactor (CoLAR) system starting from the construction of the reactor, installing biodigesters to the entire biogas installation. The biogas is used by residents around his PD Semangat Jaya factory to cook³².

The next village which has the potential for solidarity of the nation was developed in Krueng Kala Village, Aceh Besar District, Aceh Province, successfully rebuilt its territory after being hit by a devastating tsunami wave fifteen (15) years ago. After the village was hit by a tsunami, all infrastructure was damaged, dark without lighting. Together with other

survivors, the community worked together to rebuilt the village without waiting for help from the Government for long time³³.

In the consultations of the leaders of three villages, namely the villages of Baro, Teunong and Meunasah, all agreed to seek assistance in funding the construction of a Micro Hydro Power Plant (MHP) by utilizing waterfall of Suhom river located not far from the three villages.

It did not take long, the construction of the MHP with a product capacity of 25-35 KW, a total capacity of 50 KVA installed units, could be realized in 2006 thanks to funding from Coca Cola and the Nurani Dunia Foundation. The local community builds a MPH generator house in a communal manner and collaborates to meet the region's energy needs.

Around 300 houses inhabited by more than 1,500 people in three brightly lit villages have electricity powered by Suhom waterfall. At the beginning of the operation, the management of the MHP turbine was familial with inter-community management as the implementer and maintenance coordinator of the MHP equipment.³⁴

³¹ *Ibid*, p. 34.

³² *Ibid*, p. 35.

³³ *Ibid*, p. 36.

³⁴ *Ibid*, p. 51.

After the village is electrified, the behavior of people's lives changes, both social, economic and religious. This indicates that there is a diversification of people's livelihoods from purely agrarian to traders so as to increase people's income. Community social activities also increase, such as the religious recitation of women, a clean and frugal lifestyle, and awareness of environmental sustainability. This is what strengthens the solidity of the nation built by the people of Aceh after the tsunami that damaged the living infrastructure of the region³⁵.

CONCLUSION

The role of the community in maintaining the solidity of the nation through self-management of renewable energy towards energy independence supporting the forces of national defense, through the implementation of basic energy self-management includes: (1) awareness of the importance of citizen solidarity in managing renewable energy through solid community participation in a community so as not only normative appeals, but there needs to be clear regulations

regarding the active involvement of the community in supporting the 23% renewable energy mix program in 2025; (2) the community as a driver of self-management of renewable energy has succeeded in facilitating other communities in providing energy needs independently and contributing to the growth of the people's economy in supporting national defense.

SUGGESTIONS

Some considerable aspects (a) The need for awareness of the community as an important part in realizing the solidity of the nation; (b) The need for self-management principles that are synergistic between human resources (community) and natural resources (energy) supporting the strength of national solidity through the role of sustainable energy where the potential of natural resources in each region varies according to geographical conditions and can be utilized with community plurality in managing energy to support national defense.

³⁵ *Ibid*, p. 55.

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