

## GUARANTEE ACCESS TO INFORMATION OF CLIMATE CHANGE ON WATER RESOURCES BASED ON NATIONAL PLAN FOR CLIMATE CHANGE ADAPTATION IN INDONESIA

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### ABSTRACT

*Climate change is likely a heavy impact on water supply services both on supply and demand. In terms of supply, the existing tendency of changing rainfall patterns with implications for food production, water transportation, and various sources of livelihoods that rely on water. In the matter of demand, global warming will increase water needs of society and accelerating evaporation from the surface of the plant and from water sources such as ponds and lakes. Long term goal of this research to develop a model of construction regulations Integrated watershed management plans in order to meet guaranteed access to climate change information based national plan for climate change adaptation is a new strategy for strengthening the role of local governments in working out regulations Integrated Watershed Management in order to realize fulfillment of guaranteed access good information about climate change in the region.*

Keywords: Guarantee, Access to Information, Climate Change, Water Resources, National Plan

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### Introduction

Even sustainable development, as an overarching societal objective with obvious environmental connotations, reflects this goal oriented conception of environmental law and policy<sup>1</sup> Indonesia is the third largest contributor to emissions after the United States and China. Where about 72 percent of the tropical rain forests of Indonesia in 2007 has been damaged due to deforestation. Long term goal of this research to develop a model of construction regulations Integrated watershed management plans in order to meet guaranteed access to climate change information based national plan for climate change adaptation is a new strategy for strengthening the role of local governments in working out regulations Integrated Watershed Management in order to realize fulfillment of guaranteed access good information about climate change in the region. As we know that regulation is an area of strategic policy that has the highest legal force in the area. This means that if the model construction RPDAST regulations in order to guarantee the fulfillment of access to information-based climate change National Adaptation for Climate Change is really able to apply it is expected that every regulation as a legal umbrella in the region are no longer produced as its environmental damage is happening now. Targeted specifically, models generated in this study in particular has a purpose as an offer or alternative solutions legislative function well in the real of the executive and Parliament to produce regulations Integrated Watershed Management. Modeling construction in order to meet regulatory RPDAST guaranteed access to information based climate change National Adaptation for Climate Change is done by mapping existing condition phases of construction are used today. Regardless of mitigation measures, climate change is happening now<sup>2</sup> is expected to continue in the future<sup>3</sup>. This prompted the need for adaptation measures to climate change in order to reduce the potential negative and maximize the positive potential impact of climate change. The method that will be used through the stages include: mapping existing condition that during this construction is used, mapping of potential executives (leading sector) and the Council, evaluating regulations that have been produced so far (Year I), identifies and evaluates the constraints faced construction stage

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<sup>1</sup> Ebbesson Jonas, 2009, Introduction: Dimensions of Justice In Environmental Law, p. 1.

<sup>2</sup> Andersen, J., S., Hilberg, and K. Kunkel. 2012. *Historical Climate and Climate Trends in The Midwestern USA*, dalam J. Winkler, et al. (Ed) US. National Climate Assessment Midwest Technical Input Report.

<sup>3</sup> IPCC, 2007

policy, identify opportunities and formulate strategies and models that can be developed (Year II), draft guidelines and standard operating procedures, provide training, mentoring and monitoring for executives (leading sector) and legislators (Year III) Emphasis in order construction regulations do executive and Parliament to produce NPCCA based regulation. In Indonesia, the impact of climate change is indicated by an increase in frequency of climatic phenomena that can lead to droughts and floods. Climate phenomenon known as ENSO (EL-Nino-Southern Oscillation), which consists of occurrences of El Nino and La Nina greatly affect the distribution of rainfall in Indonesia. El Nino events identified with flood events. Indications are associated with reports of an increase in the frequency of droughts in Indonesia in the last 4 decades<sup>4</sup> and the incidence of flooding in many areas in Indonesia in the period 2001-2004<sup>5</sup>. In the document the National Action Plan for Adaptation to Climate Change (RAN-PI)<sup>6</sup> and Indonesia Country Report<sup>7</sup> summarized and reported various potential impacts of climate change on various economic sectors such as agriculture, forestry, fisheries, health, coastal, resource water power. Understand the potential impacts of climate change, efforts were made including preparing a legal device, among others issued Law No. 17 of 2004 on the Ratification of the Kyoto Protocol to the United Nations Framework Convention Over on Climate Change shows Indonesian government's commitment to reduce the rate of global warming. Regardless of mitigation measures, climate change is happening now<sup>8</sup> is expected to continue in the future<sup>9</sup>. This prompted the need for adaptation measures to climate change in order to reduce the potential negative and maximize the positive potential impact of climate change.

One important element that is required in conducting impact assessments and vulnerability to climate change is climate information. Research on the construction of a model regulation Integrated watershed management plans in order to meet guaranteed access to climate change information based national plan for climate change adaptation is a new strategy for strengthening the role of local governments in working out regulations Integrated Watershed Management in order to realize the fulfillment of guaranteed access to good information about climate change become important area.

What is meant by climate change is the change in climate variables, particularly temperature and rainfall that occur gradually in a long period of time between 50 to 100 years. Besides, it should be understood that the change is caused by human activity (anthropogenic), especially those related to fossil fuel use and control of land use. So the changes are caused by natural factors, such as additional aerosols from volcanic eruptions, are not taken into account in terms of climate change. Thus the natural phenomena that give rise to extreme climatic conditions such as cyclones that can happen in a year (inter annual) and El-Nino and La Nina that can happen in ten years (inter-decadal) can not be classified into global climate change. Human activity is an activity that has led to an increase in greenhouse gas concentrations in the atmosphere, especially in the form of carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), and nitrous oxide (N<sub>2</sub>O). Gas-gas was then determine the air temperature increase, because it is like glass, which can forward the short-wave radiation that is not hot, but hold long-wave radiation that are hot. The pattern and distribution of rainfall occurred with a tendency that dry areas will become increasingly dry and wet areas becoming increasingly wet. Its consequences is that the sustainability of water resources will also be disrupted. In Indonesia, three kinds of distribution patterns of rainfall, the monsoon pattern (monsoonal), equatorial and local. First, the area which is heavily influenced by the monsoon rain patterns with the peaks. The hallmark of this pattern is the rainy season and the dry crisp and each lasts for approximately 6 months, i.e from October to March as the rainy season and from April to September as the dry season. Secondly, an area close to the equator is affected by the system equatorial rain pattern has two peaks (bimodal), ie in March and October when the sun is near the equator. Third, the area with the local rainfall patterns, characterized by the shape of unimodal rainfall pattern with peaks reversed compared to the pattern of the monsoon rains mentioned above. Climate change (especially temperature and precipitation) not only cause changes in the volume of deficit or surplus of water, but also the period of the region have a surplus or a deficit. In a study of the hydrological watershed (DAS) in the equatorial regions such as Sulawesi, climate change (with the concentration of atmospheric CO<sub>2</sub> concentration 2-fold compared to pre-industrial era are only 280 ppm) will cause the watershed is not in deficit while the surpluses rose twice fold. Being a watershed in the monsoon areas such as Java, surplus water is only about 30% of the deficit period that is shorter than if the climate does not change<sup>10</sup>.

The agricultural sector will be affected by a decrease in food productivity caused by increased sterility of cereals, which can be irrigated acreage decline and decrease the effectiveness of nutrient absorption and spread of pests and diseases. In some places in the developed world (high latitudes) increase in CO<sub>2</sub> concentration will increase productivity because of increasing assimilation, but in the tropics that most developing countries, the increase was not significant compared assimilation respiration were also increased. Overall if adaptation is not done, the world will experience a drop in food production by 7 percent. However, with further adaptation level, meaning that the cost is high, food production can be stabilized. In other words, stabilization of food production on climate change will take a very high cost, for example by improving irrigation facilities, provision of inputs

<sup>4</sup> Boer, R. and Perdinan. 2008. Adaptation to Climate Variability and Climate Change: Its Socio Economic Aspect. Makalah dipresentasikan pada Workshop on Climate Change: Impacts, Adaptation and Policy in South East Asia di Nusa Dua Bali Indonesia 13-15 Februari 2008.

<sup>5</sup> MOE 2007

<sup>6</sup> Badan Perencanaan Pembangunan Nasional (BAPPENAS). 2012. *National Action Plan for Climate Change Adaptation (RAN-API)*. Jakarta: Bappenas.

<sup>7</sup> *ibid*

<sup>8</sup> Andersen, J., S., Hilberg, and K. Kunkel. 2012. *Historical Climate and Climate Trends in The Midwestern USA*, dalam J. Winkler, et al. (Ed) US. National Climate Assessment Midwest Technical Input Report.

<sup>9</sup> IPCC 2007

<sup>10</sup> Murdiyarto, D., Ridayati R. 1994. *Model Simulasi Proses-Proses Hidrologi Berdasarkan Perubahan Iklim dan Tata Guna Lahan*. Bul. Agromet. I:34-45.

(seeds, fertilizers, insecticides / pesticides) extra. In Indonesia, the scenario of CO<sub>2</sub> concentrations double the current rice production will increase to 2.3 percent if irrigation can be maintained. But if the irrigation system is not improved rice production will have declined by 4.4 percent<sup>11</sup>. Warmer temperatures will cause a shift in vegetation species and ecosystems. Mountain regions will lose many species of native vegetation and replaced by low-lying vegetation species. At the same time the condition of water resources comes from the mountains will also be impaired. Furthermore, the stability of the soil in mountainous areas also disturbed and difficult to maintain the existence of the original vegetation. This impact is not so noticeable in low latitude areas or areas of low elevation. If more and more forest fires are common in Indonesia, a bit difficult to connect between these events to climate change, because most (if not all) the incidence of forest fires are caused by human activities related to land clearing. That happened simultaneously with the El-Nino events since this phenomenon provides dry weather conditions that facilitate the occurrence of fires. However, as described above El Nino is a natural phenomenon associated with extreme climate events in climate variability, not climatic change in the sense described above.

The increasing number of people put pressure on the water supply, especially in urban areas. We have had many urban residents who have difficulty getting clean water, especially those who are income or low skilled and educated. The impact of climate change is causing changes in temperature and rainfall will impact the availability of water from surface runoff, groundwater and other reservoir shapes. In the year 2080 there will be 2 to 3.5 billion people will experience water shortages. In some watersheds (DAS) is important in Indonesia surface water availability is expected to increase due to increased surplus and decrease the deficit. The Citarum, West Java, the increase reached 32%, in the Brantas River Basin in East Java 34%, and in the watershed Saadang, South Sulawesi 132%<sup>12</sup>.

As a consequence the incidence of flooding will increase due to the declining capacity of the river due to an increase in surface runoff and decreasing the capacity of rivers and reservoirs due to increased erosion and sedimentation. Some infectious diseases is strongly influenced by climatic factors. Parasites and vectors of disease are extremely sensitive to climatic factors, particularly temperature and humidity. Diseases spread by vectors (vector-borne diseases, VBDS) such as malaria, dengue fever (dengue) and elephantiasis (schistosomiasis) need to watch out because the transmission of diseases such as this will increase with climate change.

Some 33,500 people in Asia have been interviewed to determine their perceptions and insights on climate change. Climate Institutions Asia, the largest study in the world on the experiences of everyday people in Asia related to climate change and expose in Jakarta. BBC Media Action together with the British Embassy in Jakarta initiated Asia Climate study by surveying citizens of Bangladesh, China, India, Nepal, Pakistan, Indonesia and Vietnam. It was found that citizens of Indonesia is the lowest level of his insights on how to respond to environmental changes due to climate change and also in terms of willingness to change lives. The survey data taken in June to November 2012 showed that 17 percent of the total respondents and 6 percent of Indonesian respondents categorized Surviving, they feel the impact of climate change, but it is difficult to adapt and do not know how. They do not feel integrated with the community and it is one reason why they do not take action. By 21 percent of the total respondents and 23 percent of Indonesian respondents categorized Struggling, they feel the impact of climate change and realize that the impact will increase in the future, but they do not worry. They do not take action because of a lack of money and information. Amounting to 20% of the total respondents and 11% of respondents in the category Adapting Indonesia, they feel the impact of climate change with greater insight and have greater income. They take action in both the long and short term. 19% of total respondents and 32% of respondents in the category Indonesia Willing, their well educated, broad-minded, access to good information, and open to make life adjustments related to the impact of climate change. they are willing to make changes, but has yet to take action at this time. Amounting to 23% of the total respondents and 27% of respondents in the category Unaffected Indonesia, they do not feel affected by climate change and feel they have other priorities more important. They do not make any changes in his life. "Climate Asia designed to put people's personal experience in the heart of the climate change efforts in the future. This survey shows that while the information dissemination efforts have reached a population in urban areas, there are still many rural communities or rural areas and small towns are facing a real challenge in responding to changes in the environment and want to do more," said Damian Wilson, Director of the Asia Program at the conference Climate Asia at Wisma Antara, Jakarta. Data from the study also openly accessible on the portal BBC Media Action.

## Problems

Based on the above arguments, the important question is how the evaluation of the guarantee access to information climate change on water resources based National Plan For Climate Change Adaptation?

## Methods

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11 Matthews RB, Kropff MJ, Bachelet D, Van Laar HH. *Modelling the impact of climate change on rice production in Asia*. 1995. Executive summary. CABI in association with IRRI, 13.

12 Murdiyarso, D., Ridayati R. 1994. *Model Simulasi Proses-Proses Hidrologi Berdasarkan Perubahan Iklim dan Tata Guna Lahan*. Bul. Agromet. I:34-45.

This research used empirical research on law (ELR). ELR seeks to understand and explain how law works in the real world. ELR has become a recognized part of the social science research environment. The results of empirical research on law are central to the concerns of the academic analysis of Law<sup>13</sup> as well as more generally to understanding the role of law in modern society<sup>14</sup>.

The approach used in the research problem is to use an empirical approach and normative Juridical. Juridical empirical studies with the aim to see problems in the field that can be resolved or legal reference. The study documents the analysis consists of legislation and various policies Relating to the subject matter and report results from a variety of meetings, seminars, public hearings. The Data used in this study can be classified into two types, the data primary and secondary data. The primary sources of data such as interviews and observations from the field. Secondary sources of data include the primary legal materials, secondary and tertiary. Methods of Data Collection To Obtain the Data of primary legal materials and secondary legal materials as well as materials tertiary law, business studies conducted with documents or literature that includes a data collection Efforts by visiting libraries, reading, literature review and study materials that have a strong link with the subject matter.

## Analysis and discussion

### 1. Legal Perspective

The legal aspect of guarantee access to information climate change on water resources contained in the Constitution of the Republic of Indonesia Year 1945 Article 33 (3) and Article 28 (H) states that the earth and water and natural resources contained therein shall be controlled by the state and used for the greatest prosperity of the people. In this regard, the management of the watershed as an ecosystem is essentially intended to benefit from natural resources, especially forests, land and water for the welfare of the community while preserving the watershed itself. Clearly in the Forestry Act, wrote that the purpose of the implementation of forestry is to increase the carrying capacity of watersheds and covering 30% of the total area of the watershed in the form of forest area. Meanwhile, the use of protected forest area, forest conservation and forest production should be done with caution. Similarly, use of forest products and environmental services to all functions of protected forest areas must be done in a sustainable manner without interfering with the preservation of the forest ecosystem so that the forest as part of the DAS helps to improve the carrying capacity of the watershed. DAS is defined in detail and then the watershed became part of the River Basin (WS) namely the territorial integrity of water resource management in one or more watersheds and / or small islands covering an area of less than or equal to 2,000 km<sup>2</sup>. Act Water Resources and its implementing regulations are more concerned about conservation, development, utilization / utilization, distribution and control of water damage and water resources institutions. In Act No. 26 of 2007 on Spatial Planning, noted that the planning use of space / area based protection functions and cultivation, carrying capacity and carrying capacity of the region, alignment, alignment, balance, and harmony between sectors. Spatial planning (RTRW) performed within the administrative boundaries of national, provincial, district / city to district, but consideration of the watershed as a whole ecosystem across administrative areas is still very less attention even though the definition of DAS. Provincial government authorities organized watershed management across districts / cities and Regency / City shall manage the watershed scale district / city. Several other laws and regulations related to watershed management, among others, Law No. 5 of 1990 on Conservation of Natural Resources and Ecosystems, Act No. 25 of 2004 on National Development Planning System, Regional Government Act, Law Number 27 Year 2007 on the Management of Coastal Areas and Small Islands, Regulation No. 44 Year 2004 on Forestry Planning, PP No. 6 Year 2007 jo Government Regulation No. 3 of 2008 on Forest Arrangement and Preparation of Forest Management Plan and Forest Utilization, and Government Regulation No. 76 Year 2008 on Forest Rehabilitation and Reclamation. Implementation of watershed management is also strongly associated with global issues that have become the world's attention as the Convention on Climate Change (UNFCCC), biodiversity (UNCBD) and land degradation (UNCCD), which have all been ratified by the Indonesian Government. Besides the legislation mentioned above is the basis in the implementation of watershed management, the implementation is very necessary commitment and political support of the parties, especially the head of government decision makers both at the central, provincial and district / city (executive element), parliament, legislature local (legislative elements) and law enforcement (judicial elements). Political support can be realized in watershed management mainstreaming into policies, programs and budgets at all levels of government.

The principles on which the reference for integrated watershed management, among others:

- a. Watershed management is done by treating the watershed as a whole ecosystem from upstream to downstream, one plan, one management system.

In the watershed as a whole ecosystem there are upstream-downstream linkages, the watershed resource management activities and their impact ("on-site" or "off-site impact"). This is because the presence of water as a natural resource watershed that flows from upstream to downstream. Upstream-downstream linkages is also underlies the use of watershed ecosystem as the best unit in the ecosystem-based resource management. For that there must be an integrated watershed management plan from upstream to downstream so that there is a watershed resource management system agreed by the parties involved to ensure the preservation of the watershed in the long term.

- b. Integrated watershed management involves multi-stakeholder, coordinated, holistic and sustainable. DAS natural resources are very diverse (biological and non-biological) is a complex system that integrated watershed management requires the participation of various sectors and multi-stakeholder approach to inter-disciplinary, cross disciplines and across administrative areas of government. The authority of resource management in the watershed are on more than one

<sup>13</sup> McCrudden, 2006. Legal Research and the Social Sciences. Law Quarterly Review 122: 632-50.

<sup>14</sup> Martin Partington, 2010. Empirical Legal Research and Policy Making.

sector. Therefore, integrated watershed management requires coordination, integration, synchronization and synergy between stakeholders both in setting policy, program planning and activities as well as in the implementation and control of the implementation of watershed management. Management also includes not only the utilization / utilization of natural resources but also must contain the activities of the protection and conservation of natural resources so that benefits can be sustained and control efforts against the destructive force that may arise / caused by the extreme conditions of a natural resource, because it must watershed management done in a holistic, comprehensive and sustainable.

c. Watershed management is adaptive to changes in dynamic conditions and in accordance with the characteristics of the watershed. DAS is a dynamic ecosystem where the elements of biophysical (eg: flora, fauna, climate, land, water, building infrastructure), social, economic, and cultural communities are always changing over time. Therefore, if there is a change elements of the ecosystem in the watershed will require a response from the organizers of the watershed management both in terms of policy and implementation of programs and activities that watershed management goals can be achieved.

d. Watershed management implemented by the division of tasks and functions, costs and benefits equitably among multi-stakeholders. In watershed management there are many parties involved and the many beneficiaries of watershed goods and services at the same time there are also those who create pollution or damage to the watershed ecosystem. Financing the implementation of watershed management is not fair if only borne by the government, but also to be financed by the beneficiaries of goods and services watershed and ecosystem pollutants DAS mainly for the rehabilitation, restoration and / or reclamation of forest resources, land and water for the benefit of the watershed ecosystem sustainability themselves in order to improve the welfare of society at large. The principle of fairness should also consider linkages upstream and downstream watersheds where there is often the upstream watershed must undertake forest conservation, soil and water conservation for the benefit of water resources in the area downstream of the watershed.

e. Watershed management is based on stakeholder accountability interests. Watershed management is basically the integration across sectors and administrative area in the management of resources within the framework of sustainable development. To benefit the optimum benefits from natural resources to human and other life on an ongoing basis is needed accountability of each sector or stakeholder.

## **2. National Plan for Adaptation to Climate Change.**

To the threat of climate change and global warming, Indonesia included in highly susceptible. As an island nation with a very long coastline, has millions of poor people with high dependence on natural resources for their food security days, Indonesia undoubtedly suffered enormous impact both in scale and complexity of the pads turn is potentially catastrophic and conflicts that endanger the continuity and integrity of the nation. Climate change and global warming that is now occurring around the world, including Indonesia, is a phenomenon in the sense that globally, anywhere. How a society or a nation to manage the levels of carbon emissions will affect the quality of nature and the environment around the world. The impact of climate change and global warming threatens the lives of human beings and other living organisms. Facing this problems, the Indonesian government has prepared a plan of mitigation of climate change impacts in a National Action Plan (NAP). RAN is a reference base for all components of the nation Indonesia in facing and addressing the threat of climate change and global warming. Despite the RAN has had a comprehensive scope, including on the scheme Mechanisms Clean Development (CDM), there are some aspects that could be improved in the RAN concept, among others:

- a. Approach cluster develop adaptation strategies and where there are clusters are groupings based on the special characteristics (both sector, geographical, type of disaster due to changes in climate, and socio-economic) and their specific strategies according to the characteristics of each cluster.
- b. Positioning carbon-emission-reduction (CER) not as liability community and the business world, but as an investment.
- c. stronger focus urban planning and development, and not solely focused pads Management of waste. This is because the cities and urban areas contribute to increasing carbon emissions.
- d. sharper strategy to develop a program in which the CDM small scale, medium, and large managed to optimize the benefits for the deduction of poverty and increased prosperity for the people of Indonesia.
- e. Focus on communication down-to-earth that clearly describes how critical actual nature of the impact of climate change and the warming of the earth, who will be the victims, where, and so on.

## **3. Factor influence the legal guarantee access to information**

There are some factors that also influence the legal guarantee access to information climate change on water resources based National Plan For Climate Change Adaptation: first, substance factors. A number of substance or act were born during 2007 as Act (Act) No. 24 of 2007 on Disaster Management, Law No.26 of 2007 on Spatial Planning, Law No.30 of 2007 on Energy, Law 27/2007 on the Coastal Area Management Small Islands, it does not have the ability to be utilized as an instrument in the prevention, protection of the environment and the carrying capacity of natural resources tend even more to facilitate the process of exploitation of natural resources. Act No. 32 of 2009 on Environmental Protection and Management Act. The fact in Indonesia frequent environmental disaster, reached more than 60 environmental disaster 2010-2014, the more shows that the existing laws have not been able to accommodate these issues. The second role of the judiciary. Judicial decision which frees offender shows that the judiciary as the spearhead of law enforcement, it was not sensitive to the environmental crisis and sense of justice and is still too formal and procedural correctness forward compared with extracting substantial justice. Third International agreements in the framework of environmental protection and trade in which Indonesia was involved has not been optimized in order to save the environment and ensure that people are not harmed. According to the Indonesian context, realizing good governance consistently require an overhaul and revamping of social, political and legal. Improvements to be carried out

include the provision of legal guarantees and access to information, participation in decision making and access to justice to achieve the balance of power between the elements of the state, private sector and civil society. Sustainable development calls for equitable resource management, both economically, socially and environmentally for the current generation and generations to come. To realize the intra and inter generation justice, the sustainable development based on good environmental governance (Good Governance Sustainable Development) became very absolute. The right to access information at the core of each person is entitled to obtain full information, accurate and up to date for a variety of purposes. Access to information guarantee access to information climate change on water resources based National Plan For Climate Change Adaptation is divided into two types, called the right people get the information and public officials are obliged to provide information without having preceded the request of the public (access to information for certain), the public's right to receive information and the public authorities shall make and give information if there is a request from the public (access to information actively). The right of access to justice is to strengthen the access permissions and access rights of participation information. Justice is the right of people to ask for compensation or cost recovery should their rights to information, to participate and to get a good environment. The right to a healthy environment actually been guaranteed in the 1945 Constitution Article 28 H. While the right to information and participation forms of expression as expressly provided for in Article 28F and 28C paragraph (3). Right to justice has also been guaranteed in Article 28C paragraph (2). The forth is culture. Some people in Indonesia still have bad culture in environmental protection. Some kinds of factor that influences are economics and knowledge. Some programs that also influence the legal guarantee access to information climate change on water resources based National Plan For Climate Change Adaptation are:

- 1) The need for policies expressly mandated in the form of legislation Policy efforts to integrate climate change adaptation into development policies will be more effective if the policy expressly mandated in the form of legislation. At the national level, more appropriate if the policy is formed in the Presidential Decree level or higher on it, because climate change policy is cross sectoral and can not be only focused by one department. At the local level, even though the rules at the level of heads of regions considered sufficient, but it would be better if the regulation established in the form of local regulation in order to force a stronger.
- 2) The need for the establishment of working groups or commissions climate change at the local level. The establishment of working groups or commissions related to climate change more precisely formed at the local level. This is because the region better understand the situation and conditions as well as the vulnerability of the area to the adverse effects of climate change, as well as local governments to better understand where the priorities of development in their respective areas. In addition, the process of community engagement will be more easily applied at the local level because people in the area that will be felt the direct impact of a policy. Centralized policy will not be effective in dealing with pluralistic state in Indonesia, especially in the context of overcoming the negative impacts of climate change in order to achieve sustainable development in Indonesia.

## Conclusion

Based on the description, it can be concluded that:

- 1) Local governments better understand the situation and real conditions in the field and it is they who can make an assessment of the need for adaptation and vulnerability to climate change in their respective areas.
- 2) Urgent to make a commission in local government. The establishment of the commission is more appropriate climate change formulated in the form of local regulation, because it is a form of legislation which is more concrete and legally binding.
- 3) The central government should encourage efforts to integrate climate change adaptation into national development policies through policy development so that each area of climate change policy is more fundamental and appropriate.

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