P-ISSN : 2598-1277
E-ISSN : 2621-3966

JOURNAL OF GREEN SCIENCE AND TECHNOLOGY

INTEGRATING FLOOD RISK INTO URBAN PLANNING IN INDONESIA

Novid Gumelar*

***)** Lecture in Civil Engineering Departement of Universitas Swadaya Gunung Djati Cirebon

ABSTRACT

Flood is the disaster with the highest frequency occurrence in the world resulted in the greatest loss of both material and nonmaterial. This loss is exacerbated by the incidence of floods that occur in urban areas that have large population and asset values. Efforts to reduce the risk of urban flood disaster have been done, but this effort is still sectoral. This article examines how flood risks are integrated into urban spatial planning in Indonesia. The integration of floods in Indonesia is carried out with an environmental assessment approach in the development plan, with a Strategic Environmental Assessment/SEA (KLHS) attached to each development plan.

Keyword: *Flood risk, SEA, Urban Planning.*

I. INTRODUCTION

Sustainable development is a development that can meet the needs of the current population but still take into account the ability of future generations to meet their needs (LeGates et al., 2016). In order to achieve sustainable development three main pillars must be considered in every decision taken by stakeholders, namely harmonization of social life, economic well-being, and ecosystem balance (P. Sayers et al., 2013).

When one of the pillars is ignored it will not achieve sustainable development and will even lead to a decline in the ability of meeting human needs today. Increasing environmental problems and shifts in environmental quality make the concept of sustainability applicable to all aspects of social life (Yazar et al., 2012). One of the environmental problems that affect almost all aspects of life is flood disaster caused by river water flows. Flood disaster results in adverse effects on the social system, natural system or built environment (Merz et al., 2010).

Floods are one of the leading causes of deaths from natural disasters around the world and are responsible for 6.8 million deaths in the 20th century (Doocy et al., 2013). According to Doocy et al (2013), Asia is the most affected area of the flood, accounting for nearly 50% of deaths from floods in the last quarter of the 20th century. Since 1990, there have been more than 30 huge floods, - the material loss exceeds one billion USD, or the number of fatalities greater than 1000, or both (Svetlana et al., 2015). The biggest disadvantage when floods occur in urban areas, where the density of people, assets and infrastructure are haghly massive.

Structured approaches have been built to reduce loss and damage to floods with flood risk management. Flood risk management can be defined as "continuous and thorough analysis, assessment, and mitigation of flood risk" (Schanze 2006). There has been an effort to integrate risk reduction in the life of the community but still sectoral. One is the construction sector, according to (Bosher et al., 2007) in the construction decision process requiring an in-depth comprehensive understanding of how to avoid and mitigate the effects of emergencies and disasters.

In addition to the sectoral, flood risk reduction also integrates various perspectives, namely social and technical. This is stated by (Brown et al., 2002) that flood hazard management can be achieved by establishing better integration between the technical dimensions of hazard assessment and related social vulnerability issues. Further, still according to (Brown et al., 2002), that the notion of social vulnerability, which has so far been ignored in policy formulation, should take precedence over other technical issues such as hazard assessment, but the balance between the two must be balanced and the contention that they are mutually debated done the same in the context of research.

According to the statements above, then in disaster risk reduction must be done thoroughly to all sectors of life and in various perspectives, both social and technical. Interventions, including land use planning, run-off control, flooding, flood warnings, insurance, flood resilience property improvements, and flood defense maintenance operations, make flood risk management only newly started systematically analyzed (Hall et al., 2003). Thus, it is necessary to approach outside the physical aspect in disaster risk reduction.

II. LITERATURE REVIEW

In order to achieve sustainable urban development, urban planning involves the integration of many sectoral interests, but the risk of flooding is only one sector and is usually not considered most important (Herk et al., 2011). However, when considering the disadvantages and impacts caused by floods, the city should more take into account the risk of flood disaster in urban planning.

Cities that are susceptible to flood disasters not only rely on hard measures or structural approaches, but also soft measures should also be considered. The theory of urban resilience against floods argues that a conventional city policy that states cities can not live without flood control will eventually erode the city's resilience to the flood disaster (Liao 2012).

Several cities in the world have tried to integrate flood risk management into urban planning. In the UK the flood risk is an important factor that the Local Planning Authority should consider when preparing a local plan and this is the 'material consideration' to be taken into account by the Local Planning Authority when determining the implementation of the plan. However, planners are confronted with conflicting government goals: that is, a desire to encourage housing development and the need to protect people from flooding. There is a complex relationship between urban forms, floods and development processes. The impacts of floodplain development have been widely reported and the impact is increasingly evident (Howe et al., 2004).

However, there are many obstacles to integrating flood risk in planning. Urban planning sets out to integrate various needs and requirements on spatial and temporal scales. In this case, flood

risk management is usually not considered the most important need and service opportunity and utility. The 'external integration' of broader priorities is part of a general ambition to make planning processes more inclusive in many developed countries (Herk et al., 2011). Flood risk management is a long-term goal compared to many other planning considerations.

To address this (Herk et al. 2011) suggests a transition to 'horizontal and interactive' planning, as opposed to 'vertical institutions' to encourage a flexible and dynamic planning regime. It must be flexible enough and dynamic to cope with contemporary and complex challenges - such as flood risk - that combine spatial qualities with democratic legitimacy. Multi-objective decision making decisions used in urban planning are complex and require decision-makers who are able to plan an urban area that can accommodate an uncertain future. Action is needed in the short term with short-term gains to bring about the changes needed to deliver long-term plans to make urban areas tough (Hamin et al., 2009).

However, in the complexity of the planning process there is no single group of stakeholders with final or absolute control over urban or spatial development (Herk et al., 2011). This multi-actor arrangement further explains how flood risk can be adequately addressed in the planning process. Other obstacles include increased uncertainty about changes in flood risk (Milly et al., 2008) and a lack of shared understanding or perception of the effectiveness of non-standard response actions (Adger et al., 2005). This lack of understanding also contributes to technical locks-for structural solutions, such as action actions (Adger et al., 2005).

III. METHODOLOGY

The purpose of this article is to describe the understanding of integrating flood mitigation risk management planning into urban spatial planning in Indonesia so that it is expected to reduce the risk of flood disaster.

This article begins with an introduction explaining that flood disaster can lead to unsustainable life, especially in urban areas, because the flood disaster has had a major loss due to the frequency and magnitude of the disaster. It is therefore important to undertake flood disaster risk management efforts integrated with urban planning. In the second to fourth sections respectively explain the urban planning system in Indonesia, how the concept of flood disaster risk management planning, how the urban planning process and the concept of the integration. Finally, this article concludes with a picture of integration of Flood risk into Spatial Planning in Indonesia.

IV. DISCUSSION

4.1. Indonesia's Urban Planning System

Urban planning system can not be separated from national regulation of planning. In the law no. 25 Year 2004, the National Development Planning System is defined as a unity of development planning procedures to produce long-term, medium- and annual development plans implemented by the state and community organizers at the central and regional levels.

Law No. 25 of 2004 has a very broad goal, namely to:

a. supporting coordination among development actors;
b. ensure the creation of integration, synchronization and synergy both between regions, inter-space, inter-time, between government functions and between the Central and Regional Governments;
c. ensure the linkage and consistency between planning, budgeting, implementation and oversight; optimizing community participation; and
d. ensure the achievement of efficient, effective, equitable and sustainable use of resources (Article 2).

In Law no. 25 of 2004 on National Development Planning System, explained about the approaches in the planning process that is:

a. The political approach considers that the election of the president / regional head is the process of preparing the plan, because the people choose to make their choice based on the development programs offered by each presidential candidate / regional head. Therefore the development plan is the elaboration of the development agenda offered by the president / regional head during the campaign into the medium-term development plan.
b. Planning with a technocratic approach is carried out using scientific methods and frameworks by the agency or work unit functionally assigned to it.
c. Planning with participatory approach is implemented by involving all stakeholders on development. Their involvement is to gain aspiration and create a sense of belonging.

d. While the top-down / top-down and bottom-up approaches in planning are carried out according to the governmental level. The top-down and bottom-up result plans are aligned through deliberations at national, provincial, district / city, sub-district and village levels.

Development planning based on Law no. 25 Year 2004 consists of four (4) stages, namely:

a. Planning
   Implemented to produce a complete plan of a plan that is ready to be set which consists of four steps, namely the preparation of the development plan that is technocratic, comprehensive and measurable, each government institution prepares a draft work plan based on the draft development plan that has been prepared, involving the community (stakeholders) and harmonize the development plans generated by each level of government through the deliberation of development planning and the last is the preparation of the final draft of the development plan.
b. Determination of the plan
   Establishment of a plan to establish the legal basis for the development plan generated during the planning stage.
c. Control of the implementation of the plan.
   The control of the implementation of the development plan is intended to ensure the achievement of the development objectives and targets set forth in the plan through correction and adjustment activities during the implementation of the plan by the Ministry / Institution / Local Government Work Unit leadership.
d. Evaluate the implementation of the plan
   Evaluation of plan implementation is part of development planning activities that systematically collect and analyze data and information to assess achievement of development goals, objectives and performance. This evaluation is carried out based on the indicators and performance targets listed in the development plan document. Indicators and performance targets include inputs, outputs, outcomes, benefits and impacts.

Moreover, in Law no. 25 Year 2004 there are some scope of development planning both nationally and region, that is:

a. long-term development plan (RPJP), with a 25-year period;
b. medium-term development plan (RPJM), with a span of 5 years; and
c. annual development plan.

Nationally, the National RPJP is an elaboration of the objective of the establishment of the Government of the Republic of Indonesia which is included in the Preamble of the 1945 Constitution of the State of the Republic of Indonesia, in the form of vision, mission and direction of national development. While Regional RPJP contains the vision, mission, and direction of regional development that refers to the National RPJP.

The National RPJM is an elaboration of the vision, mission, and program of the President whose compilation is guided by the National RPJP, which contains the national development strategy, general policy, Ministry / Institution programs and cross.

Ministries / Institutions, regional and cross-regional, as well as macroeconomic framework covering the overall economic picture including the direction of fiscal policy in the work plan in the form of regulatory framework and indicative funding framework.

Regional RPJM is an elaboration of the vision, mission, and program of the Head of Region whose compilation is guided by the Regional RPJP and concerning the National RPJM, contains the direction of regional financial policy, regional development strategy, general policy, and the program of regional apparatus Work Unit, and territorial programs accompanied by work plans within the indicative framework and funding framework that are indicative.

The Government Work Plan (RKP) is an elaboration of the National RPJM, contains development priorities, a macroeconomic framework design covering an overall economic picture including the direction of fiscal policy, as well as programs of Ministries / Institutions, across Ministries / Agencies, regionalities in the form of a regulatory framework and funding framework indicative and The Regional Government Work Plan (RKPD) is an elaboration of the Regional RPJM and refers to the RKP, contains the regional economic framework, regional development priorities, work plans, and funding, whether implemented directly by the government or pursued by encouraging community participation.

In addition to the development plan, there are also regulations on the implementation of spatial at every level of government, namely Law Number 26 Year 2007 on Spatial Planning. In accordance with Law Number 26 Year 2007 on Spatial Arrangement Article 11 paragraph (2),

mandates the local government of regency / city authorities to implement the spatial arrangement of the districts covering the spatial planning of the district, the utilization of the space of the district, and the control of the spatial use of the district .

The district or city spatial plan (RTRW) contains the objectives, policies and spatial planning of the district (regency); district space structure plan; the district spatial plan; the determination of the district strategic area; direction of district area utilization; and provision for controlling the utilization of district space.

The functions of local RTRW are:

1. Reference in the preparation of the Regional Long Term Development Plan (RPJPD) and the Medium Term Development Plan of the Region (RPJMD).
2. References in the utilization of space / development of regency / municipal areas;
3. Reference to realize the balance of development within the district / city;
4. Referral of investment location within the district / municipality territory undertaken by government, community, and private;
5. Guidelines for the preparation of detailed spatial plans in regencies / municipalities;
6. The basis for controlling the utilization of space in the regulation / development of regency / municipal areas which includes the establishment of zoning regulations, licensing, incentives and disincentives, and the imposition of sanctions;
7. References in land administration.

4.2. Flood Risk Management Planning

Floods according to (Schanze 2006) can be defined as temporary water inundation on land with water beyond their normal limits. This can occur in small and large river basins, in estuaries, on the coast and locally (pluvial). In addition to these general conditions, floods can be systematized according to the causes of events, such as floods due to winter precipitation, summer convection storms that cause floods, melting snow, ocean waves and tidal floods, tsunamis, increased groundwater floods, flooding urban waterways, dam breaks or reservoir control floods (Schanze 2006).

Many settlements are located in areas prone to flooding near rivers or beaches. To protect these settlements, technically the dikes have been built and these dikes have significantly reduced the likelihood of flooding. However, according to (Neuvel and Brink 2009) in the risk management literature, there is a growing consensus that, in addition to reducing flood probabilities, reductions in the consequences of floods are also needed. Further still according to (Neuvel and Brink 2009) spatial planning is increasingly considered as an important instrument to support the reduction of flood impact.

Flooding is caused by natural factors or by a combination of natural and human factors. Risk (BNPB 2008: Tingsanchali 2012) is the probability of loss and can be expressed as follows:

$$RiskDisaster = Hazard\ x\ \frac{Vulnerability}{Capacity}$$

Hazard	:	Climatology and land use factors
Vulnerability	:	the vulnerability of the people living and living on the flood plains
Capacity	:	the capacity of the population in the face of danger, whether in the form of mitigation or adaptation.

To reduce disaster risk and support sustainable urban development, where urban areas have the highest risk, it is necessary to integrate flood risk management planning to increase the value of capacity and reduce vulnerability.

Flood disaster risk management planning is done by various approaches. According to Ran and Nedovic-Budic 2016 the flood risk management approach emphasizes the importance of hazard control and reduces social vulnerability to its impact, while traditional methods are only trying to control hazards. Flood risk management, therefore, is related to outcome, which is a combination of the probability of occurrence and the impact associated with the event. This is reinforced by opinion (P. B. Sayers, Hall, and Meadowcroft 2002) that defines risk-based flood management as an overall system approach that assesses and compares structural and non-structural ways to pursue optimal amelioration effects.

Flood disaster risk management planning approaches are often carried out with spatial planning, since flood risk management strategies no longer depend primarily on structural measures and, instead, incorporate structural and non-structural actions, ie one by land use arrangements (Ran and Nedovic- Budic 2016).

Refers to the definition of planning according to (Davidoff and Reiner 1962), planning is a rational and systematic process for guiding public and private action and influencing the future by identifying and analyzing alternatives and results. Thus spatial planning in flood disaster risk

management planning can be interpreted as planning related to the arrangement of physical space and guide future activities in it in accordance with conformity and other accepted principles (Kidd 2007).

In flood-prone areas, spatial planning is expected to contribute to flood mitigation primarily because it can affect flood events and consequent damage by regulating the location of activities, types of land use, developmental scale, and physical structure design (White and Richards 2007). For example, the approach adopted in Germany and the Netherlands's 'Making Room for the River' approach emphasizes land use to prevent floods by preventing attacks on the plain water catchment areas (Krieger 2013). By contrast, still according to (Krieger 2013), the UK's 'Making Room for the River' project emphasizes the consequences that affect the risk equation and the impossibility of preventing food shortages, while the French spatial planning system is similar to the British model's goal (ie, less exposure than probability prevention) , but relatively ineffective.

Often, discussions about improving long-term flood risk management refer to spatial planning as one of the most promising policy instruments (non-structural measures), especially after flood disasters such as Dresden in August 2002 (Hutter 2007). However, until now, the evidence is limited to indicate that spatial planning is used intensively and systematically for long-term flood disaster management, for example, to reduce vulnerability in flood-prone areas by controlling floodplain developments and allowing development in non-hazardous areas Burby et al., 2000).

(Hutter 2007) argues that for the long term spatial strategic planning is more appropriate for flood disaster risk management. Further (Hutter 2007) states that strategic planning is one of 'for future professional leadership' methods to improve long-term flood disaster management. This is an important contribution to the current debate in flood disaster risk management research with the use of spatial planning as this study often narrows the planning down to regulatory practices. Instead, referring to 'strategic (spatial) planning' (Albrechts 2004) leads to a broader understanding of how planning for improving long-term disaster risk management floods.

In this regard (Hutter 2007) put forward some suggestions on how to use strategic planning in a regional strategy-making episode to influence local-level planning in the context of significant experience with flood risk management. This suggestion is based on three assumptions:

1. Strategic Planning as a Discipline Business:
   Planning is not necessary, first and foremost, an attempt to discipline collective action to implement strategic intentions, such as the opinions of some people (eg (Mintzberg 1994)). Consistent with the idea that increasing variations in planning leads to 'diversity benefits' in strategy development, strategic planning can be understood as a disciplined, disciplined undertaking to think and use different types of documents for strategy-making (eg, development plans, 'strategic studies' (Friedmann 2004)).
2. Strategic planning and learning to create strategies:
   Planning is, by definition, about the future, some say primarily about 'the desired future' (Albrechts, 2004b). However, empirical theory and research on strategic spatial planning suggests that planning is embedded in history, local trajectories, and contingencies. Thus this reflects by using the difference between learning as the exploitation of what is already known and the exploration of what might be known in the future is useful to consider the uncertainty of the flood risk as a product of physical and community conditions and the process of formulating strategies to reduce the risk of flooding , primarily through the reduction of potential damage. in flood prone areas with spatial planning.
3. Strategic planning and strategy development.
   It is advisable to learn to strategize in a regional planning episode. This leads to implications for the development of strategies at the local level without claiming to provide a thorough analysis of the relationships between these strategies at the regional and local levels. Strategy development in the context of complex governance conditions at a multi-spatial level, in different spheres of society, and with reference to various timeframes is best understood through comparative longitudinal case studies.

4.3. The Relationship between Urban Planning and Flood Risk

According to (Smith 2007) urban planning in the earliest cities has two components. The first component, coordination between buildings and spaces in a city, is based on Carter's definition of planning, and the second component is inter-city

standardization, based on Ellis's definition. Standardization in terms of urban architecture inventory, spatial, orientation, and metrology.

In developed countries, urban planning has grown rapidly with the early development of the Industrial Revolution. Backed by the emergence of awareness of policy makers for spatial planning resulting from rapid industrial growth and impact on the amount of urbanization (Pontoh and Kustiwan 2009).

Some planning approaches predominate in urban planning pracces. According to Soegijoko (2002) in (Pontoh and Kustiwan 2009) the dominant planning approach is comprehensive planning, incremental, advocacy, strategic planning, and equity planning.

Comprehensive planning is one of traditional planning, usually aiming primarily for urban physical development. According to Fainstein and Fainstein 1971 the main purpose of this planner is the development of an orderly urban environment, and the main purpose of the plan comes from the standards that should measure the desired physical arrangement. So, for example, the amount of land that will be devoted to the park will be calculated based on a fixed ratio between green space and population density. Comprehensive (traditional) planning assumes that the goal of orderly development of the environment is in the public interest and that planners are in the best position of any group to determine the objectives of the plan. The use of common standards allows the setting of planning objectives without reference to groups in the community.

In incremental planning, policymakers make decisions by weighing the benefits of a number of alternatives. This plan does not work in terms of long-term goals but moves forward through a gradual or per section approach (Fainstein and Fainstein 1971). In this case planners tend to abandon comprehensive planning and pursue realistic short-term plans (Pontoh and Kustiwan 2009). While the disadvantage of this plan is to assume that short-term responses can take over the existence of vision and theory.

Advocacy planning questions the existence of a single common interest (Pontoh and Kustiwan 2009). (Davidoff 1965) holds that a planning body is unlikely to represent the diverse needs of society. Here Davidoff wishes to express that a comprehensive plan that prioritizes the interests of land use from the perspective of planners should be shifted to the socio-economic interests of the people. In other words, planning is not only technocratic but also must be socially concerned about the voice of the people.

Another planning approach in urban planning is strategic planning. Strategic planning, as described previously, focuses on clear and specific strategic tasks, in contrast to the broad and unfocused goals of comprehensive planning (Pontoh and Kustiwan 2009). Although it is doubtful of its ability to plan for the benefit of the whole community, this plan has actually been used in the traditional planning process, although not specifically highlighted.

In contrast to strategic planning that is oriented towards fighting for the needs of the community directly to reduce inequalities, equity planning holds that planners should be a part of the plan (not outside) and fight for equal rights between majority and minority. According to (Krumholz 1982) equty planning is a way to overcome poverty and racial segregation, the root cause of the crisis in many American cities at the time. Further, still according to (Krumholz 1982), an important step to develop an active role lies in the application of clear objectives, the taking of equity objectives requires that planners focus on the decision-making process, and focus on it not with rhetoric but with difficult and relevant information . To be an effective part of the decision-making process, planners must participate in an issue for a relatively long period of time and planners should have hope that change to justice is more likely and that his work can contribute to that change.

Often the integration of flood disaster risk management planning and city planning is integrated into spatial planning alone. But actually, there are other characteristics that distinguish spatial planning in flood risk management. For example, spatial planning can affect crucial factors on a spatial scale, from local-level plans to national or even international strategic plans (White and Richards 2007). According to White and Richards 2007, planning authorities are generally given more power than agencies at risk of flooding on land use planning and development control in flood-prone areas.

Although the potential for spatial planning in flood mitigation is recognized, some practical barriers impede integration into mitigation plans (Ran and Nedovic-budic 2016). In the English context, (Howe and White 2004) found that added value to flood risk management by spatial planning was limited by the lack of integration between these two areas and inadequate coordination between spatial scales. A further study, conducted by (Wynn 2005), suggests that great pressure for development in Britain has impeded the effectiveness of development controls in flood-prone areas. (White and Richards 2007) claim that

the UK is far from translating the main guidelines into local planning practice with respect to flood mitigation. In the Netherlands, (Neuvel and Brink 2009) show that spatial planning is rarely considered a flood prevention measure and that countermeasures, especially those dealing with adaptation and recovery from flood hazards, are not usually applied in planning practice.

Therefore, the relationship between flood planning and risk management systems is weak and should be strengthened and more coordinated. Engage more stakeholders with an interest in improving the quality and implementation of existing plans (Baker, Hincks, and Sherriff 2010).

In practice, integration often refers to approaches to strengthen inter-sectoral linkages, inter-sectoral cooperation, or policy interconnection. Integration is often suggested as an approach to solving the most challenging contemporary issues that can not be addressed by a single jurisdiction or from a single perspective (Kidd 2007). For example, researchers have suggested an integrated approach to disaster mitigation.

Researchers sometimes use different terms to show the same integration dimensions. Moreover, the conceptual boundary between dimensions is not strictly described. For example, sequential integration (Kidd 2007) means 'integration of various public policy spheres' and 'integration of public, private, and voluntary sector activities in a region'. Thus, sectoral integration (Kidd 2007) lies between the 'issues' dimension and the 'actor' dimension of the conception (Underdal 1980). Therefore, sectoral integration (Kidd 2007) can be understood as a combination of 'sectoral policy integration' and 'sectoral sectoral integration'. The blurred boundary between the integration dimensions indicates that these dimensions are closely related. First, the territorial dimension tends to influence the policy integration approach. By expecting the effects of the territorial dimension, (Vigar 2009) adopted a 'governance line' methodology for analyzing cottish policies. This method allows investigators to spatially assess the interrelationships between vertical policy processes and spatial horizontal policies. Secondly, policy integration can not be achieved without efficient coordination among agencies and actors. As identified by (Stead and Meijers 2009), important institutional or organizational factors, but both can impede and facilitate policy integration.

Taking into account the characteristics of flood disaster risk management planning and complex urban planning, integrated and collaborative planning should address these barriers and involve, facilitate the complexity of decision-making. Governance and network theories show that stakeholders become more actively involved in decision-making to develop common definitions of potential problems and responses and to share interests, goals, and ambitions; and also to learn together. Interactive decision-making is expected to result in better policy proposals that can be implemented more efficiently and thus increase democratic legitimacy of decisions (Herk, Zevenbergen, Ashley, et al., 2011).

Collaborative planning is one of the forms of communicative rationality planning carried by Habbermas in 1984, which sees the old paradigm called subject philosophy is no longer in line with current conditions of plurality. The paradigm of communication theory, no longer comprehend subjectivity as an isolated subject, instead comprehending subjectivity and science as the result of intersubjective communication processes. Knowledge is the result of consensus with other subjects. This is the concept of communicative rationality (Sufianti 2014).

According to (Healey 2010), environmental planning has been understood as a process for collectively, and interactively, dealing with and working out how it should act, with regard to common concerns about how far and how to 'manage' environmental change. Nevertheless, the ongoing process of debate on environmental issues has created a contemporary, contemporary 'mindset' wherever, however liquid and critical, elements of the substantive agenda. This diverts attention from the substantive goals of environmental planning to the practices by which goals are set, actions identified and followed.

Collaborative planning is a decision-making process where multiple stakeholders, looking at issues from different angles, sit together to explore their differences constructively, then look for solutions, and to get more out of what is gained if only looking for individual solutions (Sufianti 2014). This process is a process of mutual learning between actors, so that each gain knowledge of the problems encountered through a structured dialogue, which will ultimately be mutually beneficial.

In collaborative planning the planning process largely determines the outcome. From some examples of collaborative planning implementation mentioned above, there is a process that requires dialogue, participation, and ultimately results in an agreement (Sufianti 2014).

Collaborative planning is expected to overcome barriers to integration and involve facilitation of decision-making complexities.

Government and network theory show that stakeholders become more actively involved in decision-making to develop a common definition of potential problems and responses and to share interests, goals, and ambitions; and also to study together (Herk et al., 2011). Interactive decision-making is expected to result in better policy proposals that can be implemented more efficiently and thereby increase democratic legitimacy of decisions.

V. CONCLUSION

5.1. Approaches for Addressing Flood Risk Reduction

Based on the mandate of Law Number 26 Year 2007 on Spatial Planning, all local governments (provinces, districts and municipalities) shall prepare a Regional Spatial Plan (RTRW) which is further legalized into a Regional Regulation (Perda), with a validity period of 20 years and reviewed back every 5 years. In relation to disaster risk reduction efforts, the current spatial plan should also include a disaster risk assessment to identify vulnerabilities, threat levels, vulnerability levels, and capacity levels in a region. Incorporating disaster risk reduction efforts into spatial planning, including spatial planning, spatial use, and spatial use control, should be the Government's priority in providing protection to the livelihoods and livelihoods of the people, particularly the poor and vulnerable, and siding with the conservation of the environment .

Meanwhile, Law No. 32 of 2009 on Environmental Protection and Management (UU PPLH) regulates the strategic environmental assessment (KLHS) defined as a series of systematic, comprehensive, and participatory analyzes to ensure that the principle of sustainable development has become the basis and integrated in the construction of a territory and / or policies, plans, and / or programs. In Law no. 32/2009 states that KLHS is one of the instruments to prevent pollution and / or environmental damage (article 14). Therefore, the Government and the Regional Government shall make KLHS to ensure that the principle of sustainable development has become the basis and integrated in the development of a region and / or policies, plans, and / or programs (article 15, paragraph 1).

For the preparation and evaluation of policies, plans and / or programs related to spatial planning, the obligations of KLHS implementation are inherent to Government Regulation (PP) No. 15/2010 concerning the Implementation of Spatial Planning. In this regulation, it is stipulated that the preparation of the spatial plan should pay attention to the carrying capacity and the capacity of the environment through the Strategic Environmental Review (KLHS). In the regulation mentioned that the formula of spatial planning conception must pay attention to one of the factors of carrying capacity and environmental capacity (article 27 for Provincial RTRW, Article 32 for district RTRW, and Article 35 for RTRW Kota). Furthermore, KLHS becomes a tool in determining the carrying capacity and capacity of the environment (articles 27, 32, 35, 61 and 67). This is in accordance with the UU PPLH which requires the implementation of KLHS in the preparation and evaluation or review of the spatial plan by considering the carrying capacity and the capacity of the environment.

The key issues to consider in the KLHS are:

1. climate change
2. damage, deterioration, and / or the extinction of biodiversity
3. increased intensity and coverage of flood disaster areas, landslides, drought, and / or forest and land fires;
4. quality degradation and abundance of natural resources
5. increasing the function of forest and / or land area
6. increasing the number of poor or threatened sustainability the livelihood of a community; and / or
7. an increased risk to human health and safety.

Related to disaster, Permen LH No 09/2011 concerning General Guidance of KLHS does not explicitly indicate its relation with disaster management. However, substantially 7 (seven) key issues considered in KLHS screening are highly relevant to disaster components. This indicates that KLHS is in line with disaster management planning.

VI. REFERENCES

Adger, W. Neil, Nigel W. Arnell, and Emma L. Tompkins. 2005. “Successful Adaptation to Climate Change across Scales.” *Global Environmental Change* 15(2): 77–86.

Albrechts, Louis. 2004. “Strategic (Spatial) Planning Reexamined.” *Environment and Planning B: Planning and Design* 31(5): 743–58.

Baker, Mark, Stephen Hincks, and Graeme Sherriff. 2010. “Getting Involved in Plan Making: Participation and Stakeholder Involvement in Local and Regional Spatial

Strategies in England." *Environment and Planning C: Government and Policy* 28(4): 574–94.

BNPB, Badan Nasional Penanggulangan Bencana. 2008. *Pedoman Penyusunan Rencana Penanggulangan Bencana*.

Bosher, Lee et al. 2007. "Integrating Disaster Risk Management into Construction: A UK Perspective." *Building Research and Information* 35(2): 163–77.

Brown, James D., and Sarah L. Damery. 2002. "Managing Flood Risk in the UK: Towards an Integration of Social and Technical Perspectives." *Transactions of the Institute of British Geographers* 27(4): 412–26. http://doi.wiley.com/10.1111/1475-5661.00063.

Burby, Raymond J., Robert E. Deyle, David R. Godschalk, and Robert B. Olshansky. 2000. "Creating Hazard Resilient Communities Through Land-Use Planning." *Natural Hazards Review* 1(M2): 99–106.

Davidoff, Paul. 1965. "Advocacy and Pluralism in Planning." *Journal of the American Institute of Planners* 31(4): 331–38.

Davidoff, Paul, and Thomas A. Reiner. 1962. "A Choice Theory of Planning." *Journal of the American Planning Association* 28(2): 103–15.

Doocy, Shannon, Amy Daniels, Sarah Murray, and Thomas D Kirsch. 2013. "The Human Impact of Floods : A Historical Review of Events 1980-2009 and Systematic Literature." *PLOS Current Disasters* (October 2012): 1–31.

Fainstein, Susan S, and Norman I. Fainstein. 1971. "City Planning and Political Values." *Urban Affairs Review* 6(3): 341–62.

Friedmann, John. 2004. "Strategic Spatial Planning and the Longer Range." *Planning Theory and Practice* 5(1): 49–67.

Hall, Jim W, Ian C Meadowcroft, Paul B Sayers, and Mervyn E Bramley. 2003. "Integrated Flood Risk Management in England and Wales." *Natural Hazards Review* 4(3): 126–35.

Hamin, Elisabeth M., and Nicole Gurran. 2009. "Urban Form and Climate Change: Balancing Adaptation and Mitigation in the U.S. and Australia." *Habitat International* 33(3): 238–45.

Healey, Patsy. 2010. "Planning through Debate Tne Communicative Turn in Planning tneory2." 63(2).

Herk, Sebastiaan V, Chris Zevenbergen, Richard Ashley, and Jeroen Rijke. 2011. "Learning and Action Alliances for the Integration of Flood Risk Management into Urban Planning : A New Framework from Empirical Evidence from The Netherlands." *Environmental Science and Policy* 14(5): 543–54. http://dx.doi.org/10.1016/j.envsci.2011.04.006.

Herk, Sebastiaan V, Chris Zevenbergen, Jeroen Rijke, and Richard Ashley. 2011. "Collaborative Research to Support Transition towards Integrating Flood Risk Management in Urban Development." *Journal of Flood Risk Management* 4: 306–17.

Howe, Joe, and Iain White. 2004. "Like a Fish Out of Water : The Relationship between Planning and Flood Risk Management in the UK Like a Fish Out of Water : The Relationship between Planning and Flood Risk Management in the UK." *Planning Practice and Research* 19(4): 415–25.

Hutter, Gérard. 2007. "Strategic Planning for Long-Term Flood Risk Management: Some Suggestions for Learning How to Make Strategy at Regional and Local Level." *International Planning Studies* 12(3): 273–89.

Innes, J.E., and D.E. Booher. 2010. "Beyond Collaboration Democratic Governance for a Resilient Society." *Planning with Complexity, An Introduction to collaborative rationality or public policy*: 196–215.

Kidd, Sue. 2007. "Towards a Framework of Integration in Spatial Planning: An Exploration from a Health Perspective." *Planning Theory & Practice* 8(2): 161–81. http://www.tandfonline.com/doi/abs/10.1080/14649350701324367.

Krieger, Kristian. 2013. "The Limits and Variety of Risk-Based Governance: The Case of Flood Management in Germany and England."

Regulation and Governance 7(2): 236–57.

Krumholz, Norman. 1982. "A Retrospective View of Equity Planning Cleveland 1969–1979." *Journal of the American Planning Association* 48(2): 163–74. http://www.tandfonline.com/doi/abs/10.1080/01944368208976535.

LeGates, Richard T, and Frederic Stout. 2016. *The City Reader Sixth Edition*. Sixth. New York: The Routledge Urban Series.

Liao, Kuei-hsien. 2012. "A Theory on Urban Resilience to Floods — A Basis for Alternative Planning Practices." *Ecology and society* 17(4).

Merz, B, J Hall, M Disse, and A Schumann. 2010. "Fluvial Flood Risk Management in a Changing World." *Natural Hazards and Earth System Sciences* 10: 509–27.

Milly, P C D et al. 2008. "Stationarity Is Dead : Whither Water Management ?" *Science* 319(5863): 573–74.

Mintzberg, Henry. 1994. "THE FALL AND RISE OF STRATEGIC PLANNING." In *New York : The Free Press*,.

Neuvel, Jeroen M M, and Adri Van Den Brink. 2009. "Flood Risk Management in Dutch Local Spatial Planning Practices." *Journal of Environmental Planning and Management* 52(7): 865–80.

Pontoh, Nia K, and Iwan Kustiwan. 2009. *Pengantar Perencanaan Perkotaan*. Bandung: Penerbit ITB.

Ran, Jing, and Zorica Nedovic-budic. 2016. "Computers , Environment and Urban Systems Integrating Spatial Planning and Fl Ood Risk Management : A New Conceptual Framework for the Spatially Integrated Policy Infrastructure." *CEUS* 57: 68–79. http://dx.doi.org/10.1016/j.compenvurbsys.2016.01.008.

Ran, Jing, and Zorica Nedovic-Budic. 2016. "Integrating Spatial Planning and Flood Risk Management: A New Conceptual Framework for the Spatially Integrated Policy Infrastructure." *Computers, Environment and Urban Systems* 57: 68–79. http://dx.doi.org/10.1016/j.compenvurbsys.2016.01.008.

Sayers, P. B., J. W. Hall, and I. C. Meadowcroft. 2002. "Towards Risk-Based Flood Hazard Management in the UK." In *Proceedings of the Institution of Civil Engineers - Civil Engineering*, , 36–42. http://www.icevirtuallibrary.com/doi/10.1680/cien.2002.150.5.36.

Sayers, Paul et al. 2013. *Flood Risk Management : A Strategic Approach*.

Schanze, Jochen. 2006. "Flood Risk Management–a Basic Framework." In *Flood Risk Management: Hazards, Vulnerability and Mitigation Measures*, , 1–20.

Smith, Michael E. 2007. "From and Meaning N the Earliest Cities : A New Approach to Ancient Urban Planning." *Journal of Planning History* 6(3): 3–47.

Stead, Dominic, and Evert Meijers. 2009. "Spatial Planning and Policy Integration: Concepts, Facilitators and Inhibitors." *Planning Theory and Practice* 10(3): 317–32.

Sufianti, Ely. 2014. "Kepemimpinan Dan Perencanaan Kolaboratif Pada Masyarakat Non-Kolaboratif." *Jurnal Perencanaan Wilayah dan Kota* 25(1): 78–96.

Svetlana, Dobrovicová, Radovan, Dobrovic, Ján, Dobrovic. 2015. "The Economic Impact of Floods and Their Importance in Different Regions of the World with Emphasis on Europe." *Procedia Economics and Finances* 34(15): 649–55.

Tingsanchali, T. 2012. "Urban Flood Disaster Management." *Procedia Engineering* 32: 25–37. http://dx.doi.org/10.1016/j.proeng.2012.01.1233.

Undang-Undang No. 25 Tahun 2004 tentang Sistem Perencanaan Pembangunan Nasional

Undang-Undang No. 26 Tahun 2007 tentang Penataan Ruang

Undang-Undang No. 32 Tahun 2009 tentang Perlindungan dan Pengelolaan Lingkungan Hidup

Underdal, Arild. 1980. "Integrated Marine Policy What? Why? How?" *Marine Policy* 2(3): 159–69. http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv%3Al66049.

Vigar, Geoff. 2009. "Towards an Integrated Spatial Planning?" *European Planning Studies* 17(11): 1571–90.

White, Iain, and Juliet Richards. 2007. "Planning Policy and Flood Risk: The Translation of National Guidance into Local Policy." *Planning Practice and Research* 22(4): 513–34.

Wynn, Peter. 2005. "Development Control and Flood Risk: Analysis of Local Planning Authority and Developer Approaches to PPG25." *Planning Practice and Research* 20(3): 241–61.

Yazar, Kadir Hakan, and Okan Murat Dede. 2012. "Sustainable Urban Planning in Developed Countries : Lessons for Turkey." *International Journal Sustainable Development Planning* 7(1): 26–47.