TECHNICAL KNOWLEDGE AND POLITICS OF WATER MANAGEMENT DECISION MAKING: A CASE STUDY OF WATER ALLOCATION IN CHONBURI PROVINCE, THAILAND

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ABSTRACT

Decision-making on water allocation is a complex issue as decision makers need the support of technical knowledge to rationalize their decisions. However, it does not mean that science can provide a complete solution when it has to deal with different needs and concerns about water. Economics, values, politics and other factors also involve in water resources management. Government is usually the one who assesses water availability, plans and makes a decision on how water should be allocated, and ensures wide participation by stakeholder in decision-making. More involvement of stakeholder is very important for effective water policies, more equitable access and sustainable use. On the other hand, it may affect the use of technical knowledge. The study aims to take technical knowledge into consideration identifying what roles have technical and political regimes played in water allocation decision-making. From the eyes of water engineers, they suggest water allocation based on technical knowledge; however, their suggestions may not be the answer in practice. I intend to apply the concept of technical knowledge-policy relationship to identify how water in the case study of Chonburi province in Thailand should be allocated according to technical knowledge, and how water is actually allocated. A single-case study as qualitative research method and multiple methods are employed to collect both primary and secondary data including interviews, direct observations, and documentation. This study helps to bridge the gap between technical knowledge and politics; and gains a deeper understanding of water allocation decision.

Keywords: decision-making, technical knowledge-policy relationship, water allocation, water politics, water resources management

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INTRODUCTION

Water allocation is a sharing water resources among competing users with its constraint. It determines who take water, how much water they can take, from which locations, when and for what purpose (Speed et al. 2013). It aims to allocate water with equity, environmental protection, development priorities, balancing supply and demand, and promoting the efficient use of water. Government is usually the one who assesses water availability, plans and makes a decision on how water should be allocated, and ensures wide participation by stakeholder in decision-making. More involvement of stakeholder is very important for effective water policies, more equitable access and sustainable use.

Making decision on such a complex issue, decision makers need the support from technical knowledge and scientific information in terms of modelling and calculating, such as physical characteristics of the area, water availability, water demand assessment, and growth projection. Traditionally, technical knowledge is used to rationalize decision making in water resources management (Lemos et al., 2010), but it does not mean that science can provide a complete set of solution when it has to deal with different needs and concerns about water. Economics, values, politics and other factors also involve in water resources management; however, technical knowledge is still an essential part (Policansky, 1998).

Meanwhile, oftentimes, there are some complaints by scientists that decision makers ignore their information. On the other hand, others criticized that because the results of scientific research are not readily available or accessible, and presented in unusable form (Liu et al., 2008). Technical knowledge and advices from scientists can be determined as normative way of how water should be allocated, but what is actually decided by decision makers may be different.

MATERIALS AND METHODS

To illustrate the roles of technical knowledge in decision-making, Chonburi province is a suitable area to study, located in eastern region of Thailand, where has many reservoirs under control of the Royal Irrigation Department (RID) and competing demands from different water sector. There is one of the strategic areas where the government has promoted to be the Eastern Seaboard, an industrial hub of the country. Chonburi province is also the location of popular tourist attraction, such as Pattaya city. With strong support from government, land use in Chonburi has changed to industrial and urban areas affecting water availability and increasing water demand. The roles of technical and political regimes in water allocation decision-making are intended to study in this paper. Technical knowledge from water resources engineers is used to inform stakeholder about physical and environmental aspects, and support better informed decisions (Lemos et al., 2010). Nevertheless, in practice, decision on water allocation might depend less on technical knowledge due to politics.

Decision-making is based on the knowledge available about the problem and possible solutions; therefore, knowledge is necessary as an input into a rational decision. Scientific knowledge is normally related to the natural and physical sciences but technical knowledge is not necessarily scientific. However, this research focuses on technical knowledge regarding science which is applied to make decisions on water allocation. Scientific knowledge plays a major role and a driver in environmental policy-making establishing the facts about environmental realities (Keeley & Scoones, 1999), and has the important roles in knowledge production and seeking solutions. Administrators, bureaucrats and agents implement technocracy and rational decisions created by science (Keeley & Scoones, 1999), on the other hand, using technical knowledge can reinforce traditional forms of technocratic decision-making and undermines good governance goals (Lemos et al., 2010).

Nowadays, scientific knowledge is more contest than its traditional image. Ideally, science would provide clear, uncontested information for policy makers to consider with other social, economic and political aspects (Corson-Rikert, 2011). Decision makers and public look to science for information and guidance because knowledge produced by scientists is advanced and reliable (Andresen et al. 1994). However, the interactions and relationship between technical knowledge and decision makers are much more complex than passing information from producers to users (Rice et al. 2009). Dimitrov (2003) argues that science is not a sole variable and can be divided into knowledge about extent, causes and consequences (as cited in Williams, 2012). Cash et al., (2003) suggest that stakeholders perceived scientific information as credibility (the scientific adequacy), salience (the assessment to the needs of decision makers) and legitimacy (the perception that science is respectful, unbiased and fair).

Policy is a product of a linear process through stages of agenda-setting, decision-making and implementation (Keeley & Scoones, 1999). Andresen et al. (1994) break down three stages of the policy process to see the role of science in each stage:

1) Problem identification and diagnosis (agenda-setting); at this stage science is expected to play an important role.

2) Selection of policy response (decision-making); this is the stage of bargaining and less role of research.

3) Implementation and enforcement, evaluation; science is more important than at stage 2), but less important than at stage 1).

To explore the science-policy interface, Gulbrandsen (2008) uses a rational-instrumental approach, a political-institutional approach and a political economy approach. In a rational-instrumental approach, scientific knowledge is viewed as a source of facts and theories that should guide policy-makers. The political-institutional approach sees scientific knowledge dependent of political context. On the other hand, Rice et al. (2009) argue science and politics are not separate spheres of knowledge and practices, but they are coproduced.

The use of scientific knowledge by policy makers does not get established in policy as a straightforward linear process (Keeley & Scoones, 1999; Wesselink et al., 2013). There are literatures criticizing the idea of rational, scientifically-driven policy-making because it is not always clear when a policy issue is going to be decide on technical arguments, and even how these choices should be made. Do decision makers use technical arguments and advices from technical experts to escape difficult issues? Scientific modelling may hide a range of uncertainty which sometimes may be ignored by both scientists and policy-makers. Scientific methodologies may themselves be problematic, with assumptions that appear to be hold true under one set of circumstances failing under alternative scenarios. Moreover, the literature on the 'risk society' again illustrates the problematic nature of science and policy interactions argued by Beck that science played the role of freeing societies from traditional constraints through the promise of greater control and management resulting in transforming industrial societies into risk societies. Scientific knowledge can no longer be taken as supporting social development unproblematically (Keeley & Scoones, 1999). Weingart (1999) argues that the 'scientization' of environmental issues privileges scientific experts as the one in charge of defining and assessing environmental problems as well as providing the knowledge and solutions to solve them (as cited in Wesselink et al., 2013).

RESULTS AND DISCUSSIONS

Water resources allocation in Thailand is mainly under the responsibility of the Royal Irrigation Department (RID), a government agency, established in 1904 to develop water resources for irrigation. Most of the reservoirs and irrigation projects are under RID's responsibilities which means RID controls a major water resources in the country. The irrigation dams were built in order to store water for consumption and agricultural use so that the priority of water allocation should be agriculture and domestic sectors. Nowadays, demands for water from the reservoirs are competing among different users that RID has to supply water in the reservoirs to various water users and purposes; e.g. domestic use, agriculture, industry, sufficiently with other functions of flood and drought mitigation, and environmental flow maintenance.

In the past, water management in Thailand has concentrated on supply-side management by constructing of irrigation dams and water distribution systems to respond to the early stage of development. Water resources management is currently shifting to demand-side and more comprehensive strategy emphasizing on the organizational and institutional managements with respect to environmental sustainability (EDMS, 2007). To find out the previous and current water allocation policies, the National Economic and Social Development Plans prepared by the National Economic and Social Development Board (NESDB) every five-year as the strategic development plan have been reviewed. From the First Plan (1961-1966) to the Third Plan (1972-1976), there have been no comprehensive plans and policies regarding water resources allocation. Before the Eighth Plan, water resources management has been emphasized on supplying agricultural sector, and afterwards water sources have been developed and created for other sectors (e.g., industrial use; transportation; and consumption). Therefore, in the Ninth Plan (2002-2006), encourages effective use of water and equitable water allocation. Overall, there are no clear master plans or water allocation policies in the National Economic and Social Plans, but there are only broad water-related policies.

The basic definition of water allocation is the sharing of water among users. Sharing water is more complicate than sharing other natural resources. Another definition is the combination of actions which enable water users and water uses to take or to receive water for beneficial purposes according to a recognized system of rights and priorities (Economic and Social Commission for Asia and the Pacific, 2000). ESCAP (2000) defines the elements of water allocation into legal basis; institutional base; technical base; a financial and economic aspects; the public good; participation; and structural and development base. The strategy of water allocation is allocating water fairly to all sector with clear guidelines and regulation for sustainable water resources management. Good water governance exists where government bodies responsible for water establish an effective policy and legal framework to allocate and manage water in ways responsive to national, social and economic needs, and to the long-term sustainability of the resource base (Asheesh, 2007). There are no fixed formula for water allocation; therefore, decision on water allocation is ultimately made by politics (Speed et al., 2013).

Nowadays, water allocation is not only sharing water in order to meet the demand but also relates to the need for reallocation, environmental need, and climate change. Speed et al. (2013) define objectives of water allocation including equity, environmental protection, development priorities, balancing demand and supply, and promoting the efficient use of water. To decide on how water will be allocated, water resource availability; environmental requirements; existing water use and future demand; and priorities are needed to be assessed. These assessments are identified based on technical knowledge, i.e. collecting hydro-meteorological data, and mathematical modelling to develop scenarios for water balance.

The Royal Irrigation Department (RID) and the Electricity Generating Authority of Thailand (EGAT) are two agencies which play an important role in water allocation in Thailand. RID is responsible for water distribution within irrigation system and water sources development. EGAT has role releasing water from the major dams for hydropower generation by coordinating with RID. In the area of this study, Chonburi province, there are no dams or reservoirs under the responsibility of EGAT. Bulk water in Chonburi has been distributed to water users, namely, the Provincial Water Works Authority (PWA) to supply for domestic consumption; the East Water which is the only one private company supplying raw water for both domestic and industrial uses; and farmers in the irrigated areas. Eastern Water Resources Development and Management Public Company Limited (East Water) is a private company which was initially established according to the Cabinet's Resolution on September 12, 1992 to be responsible for the development and management of raw water pipeline systems due to the Eastern Seaboard project. East Water currently supplies raw water from RID's reservoirs through pipeline systems to industrial area and waterworks.

Demands in water for consumption, industry and service sectors in Chonburi province are still raising; therefore, there is necessity to have an appropriate water allocation system to reduce conflict with agricultural sector. The Regional Irrigation Office 9 (RIO 9) which has Chonburi as one of the responsible areas is a main organization cooperating with water users in making water allocation decision from the reservoir. Every year RID formulates water allocation and cultivation plans for dry and wet seasons under the principle of sustainable water resources management by allocating water based on supply in the reservoirs to support every water use activities throughout and fairly. To allocating water, RID determines the priorities for water allocation into:

1) domestic consumption and water supply (tap water);
2) ecological conservation, i.e. salinity, and pollution control;
3) agriculture;
4) industry.

According to reviewing the RID's water allocation and cultivation plans for wet season in 2015, the RIO 9 allocated water from twelve reservoirs in Chonburi for agriculture, domestic consumption, and industry, respectively. On the other hand, water allocation for dry season in 2014/2015 was given firstly to domestic consumption, industry, and agriculture, respectively (Office of Water Management and Hydrology, 2015, 2014).

Traditionally, water resources has been mainly managed by scientific and technical approaches, i.e. hydrology, water engineering, and meteorology. Social science has been widely recognized in water resources management after the concept of integrated water resources management (IWRM) has been developed. However, science is still the significant tool supporting decision making. In the NESDB's plans, water resources information system has been encouraged to support planning and policy formulation regarding to water allocation. Hydrological and hydrological modelling is necessary to understand the natural flow and water availability under different scenarios; and considering with physical characteristics of the basin, population, and current and future demand. RID's water resources management depends largely on hydrological modelling to simulate and forecast rainfall-runoff based on the previous statistical data which it is now facing with uncertainty of climate change. Water balance model is being used in water allocation for large and medium scale reservoirs. The model is a calculation of daily inflow-outflow and the remaining water volume in the reservoirs by inputting water demands, supply, inflow from runoff, evaporation, and leakage. Lack of enough scientific data may limit decision-making. Despite these technical considerations, the political power tend to involve in making water allocation decision that favor the allocation to particular sectors in the reality.

Water engineering in Thailand has been rooted since 1902 when the Royal Irrigation Department (RID) was established and started planning the irrigation projects. RID also found their own school teaching in the field of irrigation diploma to be an irrigator for RID. This irrigation school has latter cooperated into the Faculty of Engineering of Kasetsart University with the curriculum on hydrology and civil engineering (Sangkhamanee, 2010). For a century, RID has played a significant role in Thailand's water resources development and management, particularly irrigation system. Having full authority to construct and manage most of the reservoirs in the country; therefore, RID themselves is both technician and water decision-maker. Sangkhamanee (2010) argues that scientific and technical knowledge is chosen and applied for political, social and economic reasons rather than scientific rationale itself. Accordingly, Wesselink et al. (2013) reason that environmental discourses such as ecological modernization or sustainable development are not neutral, but are in practice based on human and political interpretations of technical knowledge by powerful interests. As Neumann (2005) explains, discourses shape policy priorities and power relations and produce social and environmental effects (as cited in Wesselink et al., 2013).

Water resources management in Chonburi can be classified into three ways as follows:

1) Privatization: partly selling water to private sector
2) State water agency: technical bureaucratic management
3) Public liberation: public participation among water users

Technical knowledge used by RID is not only legitimacy for their knowledge and decisions but it can also intimidating others. Many political ecologists argue that there are no purely technical and neutral in environmental science. The assessment based on hydrological modelling is also problematic dealing with uncertainty and limitations on the definition of the parameters, the quality of the input data, and the conceptual framework of the model, moreover, power relations or people are excluded from the model. This hydrological assessment can be shaped and used by government water resources agency before, during and after production which allow them to make desired decisions in resources management (Budds, 2009).

CONCLUSION

Water resources management has shifted from the traditional scientific-based approach, and has been integrated with different fields of knowledge, for instance, natural scientific, environmental, social, and economical aspects for sustainability. Technical knowledge is less important in many studies on water resources management. However, scientific and technical knowledge is the crucial part in supporting the planning and management of water resources. This study helps to bridge the gap between technical knowledge and politics; and gains a deeper understanding of water allocation decision. With the framework of technical knowledge-policy relationship, the study indicates the roles of science and politics in water allocation which is not solely based on technical knowledge. Finally, the research recognizes the significance of technical and political regimes in urban water resources management which is unable to be considered separately.

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