

Regional Approach for River Management : - Policy Implications From U.S. Experience? -

지방정부중심의 강 관리방안 - 미국의 지역협의체형태를 중심으로 -

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이 연구는 환경문제, 특히 여러 지방정부들이 서로 영향을 주고 받는 물오염문제를 어떻게 효과적으로 해결할 것인가를 논의한다. 다른 나라와 마찬가지로 한국도 최근에 와서 물과 관련한 지역적 갈등현상이 증가하고 있는데도 불구하고, 그동안 성공적인 지방정부간 협조체계나 기구들이 제대로 기능했다고 볼 수 없다. 이는 한국의 중앙집권적인 정부기능의 방향에서 주된 이유를 찾아 볼 수 있다. 이 논문은 지방정부들의 협력을 바탕으로 하는 지역적인 환경관리체계의 필요성을 강조하는데, 이의 구체적 논의를 위해서 미국의 몇몇 성공적인 수계관리사례들을 살펴본다. 이러한 사례분석을 통해서 한국에서 최근 일어나고 있는 강유역의 지방정부간 갈등현상들을 제도적으로 해결하기 위한 몇가지 정책적 방향을 제시하고자 하는데, 첫째는 수계관리기능의 조정 및 통합, 둘째는 중앙정부의 역할제고, 셋째는 시민참여의 방안 등이다.

주제어 : 미국수계관리, 지방정부적 접근, 정부간 환경관리, 지역협의체, 낙동강

I. Introduction

The need for 'regional' environmental management institutions is ever pressing, primarily because most environmental problems have geographic and intergovernmental implications. Due to physical linkages and interdependence of environmental system, an environmental change or occurrence in one area easily affects the other around the area. Regional cooperation at and between governmental levels, especially in the field of environmental management, has been discussed in terms of an institutional framework that usually includes laws, policies, and administrative structures and procedures. The need for water management institutions in particular has been underscored by increasing water scarcity, heightened concerns about water quality, and the growing interest of regions in their water resources (Thorson 1994). When a river, for example, flows through more than one govern-

mental jurisdiction in a country, transboundary water pollution can be one of the most controversial issues among governments along the river areas.

In Korea, however, national and local government agencies seldom have made collaborative regional water management decisions in a transboundary watershed. Lack of dialogue about region-based water management is not justified, considering a variety of regional environmental conflicts recently occurred in Korea. One of the prominent examples is shown in the Nakdong River basin area where upper and lower region of the river have been facing each other with a sharply contrasting regional concern.¹⁾ Because of an absence of discussion of current policy frameworks for intergovernmental joint water management efforts in Korea, it seems reasonable to explore another nation's experience in this field and then to see what lessons may be applied to transboundary river management policy. The U.S. has had several useful interstate management and planning schemes in a variety of policy fields. Despite the differences between U.S. and Korean political systems, successful resolutions of water management issues in the U.S. may suggest ways to resolve the water-related conflicts in Korea. This study investigates several institutional frameworks for regional cooperation in the field of water management in the U.S. In so doing, a few particularly successful examples of transboundary water management are briefly highlighted. This study then elicits policy alternatives that can be used for resolving the water disputes in a river area.

II. Centralization vs. Decentralization for Water Management

When a river flows through more than one political entity, the river has transboundary characteristics. From an ecological perspective, political boundaries are often arbitrary and, consequently, can constitute significant impediments to effective environmental management. In the U.S. federal system, there are two general approaches to environmental management in the intergovernmental transboundary context: federal governmental intervention and intergovernmental cooperation (Kennett 1997). These two approaches have different perspectives to effective environmental management.

1) The water quality of the Nakdong River was jeopardized because of the big industrial complex (Wichon Industrial Complex) that was planned to establish in the upstream region of the river. While the complex was expected to bring huge economic benefits to upper region of the river, it would result in serious water pollution in the downstream region of the river, which would evidently aggravate the quality of drinking water for lower region. The main conflict in the watershed culminated from different concerns and interests of several local governments involved in the water area: economic concern for upstream region, environmental concern for downstream region. After a long period of regional hostility between two river areas, the complex construction plan was recently dismissed because of the serious opposition of downstream regions toward the plan. Instead, the government in the upstream is planning to establish research and technology complex, leisure and recreational facilities, and a big new town complex. Experts say that the possibility of regional conflict still exists unless the new plan is purely 'pro-environmental'.

Proponents of federal (central) governmental intervention or participation propose that local boundaries are often arbitrary from an ecological perspective. They agree that boundaries can constitute significant impediments to effective implementation of environmental law and policy. Dworsky (1991) is one of advocates of federal (or central governmental) intervention especially in the presence of spillover effects from one state to another in the nation's river basins. In the case of jurisdictional environmental dispute between local governments, there is no effective substitute for central government's participation. This argument is based on the capabilities of central (or federal in the U.S.) government in political, financial, and regulatory action for a variety of water management programs. These capabilities apparently enable central governments to take care of local disputes in an effective way. He also argues that fragmentation of responsibilities and lack of effective coordination in and among states and national water agencies are major obstacles to be overcome in the pursuit of an effective national water policy. This is the main reason that local governments want national government to be a member of a commission even in functional areas which are almost entirely within local jurisdictions. In the commission, central government is apparently expected to play a coordinating role among local governments. Furthermore, researchers who are supportive of centralized authority argue that the human threat to ecosystem health is so great that centralized governmental authority and power must protect and manage ecosystems for the future (Cortner and Moote 1999).

In reality, however, quite the contrary seems to have occurred. Despite some functional limitations of interstate cooperation as compared to national governmental intervention, numerous types of region-based approaches have been developed to deal with environmental management in both domestic and international contexts. Proponents of this perspective argue that a more decentralized approach to resource administration is needed so that people closest to the problems can take responsibility for local-level management. This approach assumes that when local communities are empowered to practice leadership, they can do so more effectively than can remote bureaucracies. Among the various types of region-based environmental management approaches are interstate compacts (Briggett 1991; Davis 1996; Kearney and Stucker 1985), regional councils (Gage 1984; Grigsby III 1996; Grossman and Wallis 1994), and special districts (Nunn and Schoedel 1997; Stephens and Wikstrom 1998). These institutional entities of regional governance address a variety of jurisdictional boundaries issues between states, cities, or counties (Marshall 1998; May, Burby, Ericksen, Handmer, Dixon, Michaels, and Smith 1996; Munro 1997; Weitz and Seltzer 1998).²⁾ Regional governance is an effort to coordinate and implement public sector activities in an area covering more than one local jurisdiction (Lim 1983).

2) As opposed to regional *government*, which addresses actual political units (Weitz and Seltzer 1998), regional *governance* is a broader concept referring to the collective capacity to assess needs and opportunities, and to mobilize and manage resources in response to them (Wallis 1994).

The U.S. is not the only ground in which regional governance has been implemented; indeed, a wide variety of regional-level strategies have been employed around the world (Albrechts 2001; Hansen, Higgins, and Savoie 1990; Marshall 1998; Munro 1997; Newman 2000). Regional approaches can be classified according to purpose (e.g. economic development, urban planning, land use regulation, resource management, or environmental management), type (e.g. interstate compact, commission, regional council, or special district), number of functions (e.g. general multi-purposes or single-function), and scale (e.g. metropolitan, bi-state, or multi-state). In spite of different types, functions, and roles, these regional approaches have common principles of, and directions for, environmental management. One of the commonalities is that less emphasis is placed on federal or central governments, especially when several local actors or parties are involved in environmental management. Instead, more emphasis is put on subnational units such as local governments, regions, basin areas, or districts.

Ⅲ. Types of Region-based Approaches

When it comes to the types of regional approach, there are interstate compacts, regional councils, and special districts. Table 1 shows the results of comparison of these three types of regional approach in this study. In the U.S., several institutions have formed to assist in the coordination of sub-national governments and/or in the resolution of interstate conflicts. The 'interstate compact' is essentially an agreement attempting to resolve conflicts over numerous issues concerning the participating states. Conflicts are not the only issues that make an interstate compact necessary. It is a valuable mechanism for promoting interstate cooperation (Zimmerman 1996). Three basic steps in launching an interstate compact are the negotiation of a draft compact by delegates from interested states, the ratification of the compact by the legislatures of states that wish to become part of the interstate group, and congressional consent to the compact (Kearney and Stucker 1985). Although congressional consent and federal representative membership in compact commissions are required, it is states that essentially initiate, negotiate, and implement the compacts. One feature that distinguishes interstate compacts from other types of regional cooperation is that interstate compacts empower states to take positive action (Barton 1967).

The fields in which an interstate compact has been used are numerous and varied: including crime control, pollution abatement, conservation of fishery resources, forest fire protection, flood control, and recreation. Despite the diversity of their subject matter, the compacts generally contain several common elements: the legal basis of the compact, a statement of conditions which motivate the compact, the compact's goals, the obligation of the compact in terms of correlative rights and duties, definitions of terms used in the compact, a provision for the alteration of the compact, a statement of the time at which the

compact takes effect, and the means by which the compact may be terminated or a termination date (Thursby 1953).

With respect to types of compacts, Florestano (1994) reported that since 1970, there has been a marked increase in the number of river waters and management, environmental, and transportation compacts. The Council of State Governments (1983) confirms that water-related interstate compacts are the most common type. As of 1983, out of a total of 121 interstate compacts, 34 (28 percent) deal with water-related subjects such as water apportionment, water resources and flood control, or water pollution control (Council of State Governments 1983). Among the prominent examples of interstate compacts for water management are the Upper Colorado River Compact, the Ohio River Valley Water Sanitation Compact, the Delaware River Basin Compact, and the Great Lakes Basin Compact. These water-related compacts will be discussed briefly in the next chapter.

<Table 1> Comparison of Types of Regional Governance

| | Interstate Compact | Regional Council | Special District |
|--------------------------------------|---|---|--|
| Political power of local governments | Powerful (congressional consent not required) | Less powerful (initiation by federal government) | Initiation by state legislature |
| Causes of formation | Dispute resolution / interstate cooperation | Rapid growth of urban area | Unsuitability of existing governmental functions |
| Number of functions | Mostly single | Multiple | Single, a few or multiple |
| Examples | Delaware River Compact | Metropolitan Regional Council in New York | Metropolitan districts / school districts |
| Regional extensiveness | Interstate | Metropolitan area | Covers several cities or counties |
| Scale | Bigger than the other two | Smaller than interstate compacts | Smaller than interstate compacts |
| Limitations | Inflexibility / slowness in negotiation | Too much reliance on federal government / fragmentation of governmental functions | Politically less accountable |

Another type of region-based approach is 'regional council'. Regional councils have formed to meet challenges posed by changing conditions, such as rapid metropolitan growth and restructuring. The concerns that regional councils typically address include land-use programs, economic development planning, human and health service delivery systems, pollution mitigation initiatives, waste management planning, and water pollution control. Two characteristics distinguish regional councils from other region-based entities. First, regional councils are dependent upon federal policy decisions. Despite the past laxity of its influence on regional, the federal government recently has offered many incentives to local jurisdictions to create and operate regional councils, primarily by making funding available

through categorical grant programs (Grigsby III 1996). Regionalism that comes by a national regional policy and process, is not a path that guarantees independence in an inter-governmental partnership (Grossman and Wallis 1994). Second, while interstate compacts usually address a single agenda (e.g., water supply, flood control, or water quality) concerning two or more states, regional councils, as a network, have multiple types of programs functioning as coordinating agencies (Gage 1984).

The 'special district' is another example of regional governance. The rise of special districts is perhaps the most salient feature of the U.S. local government structure (Axelrod 1992). Like other forms of regional governance, the special district is also able to surmount the geographical, financial, and political barriers commonly associated with local governments. It is not under the jurisdiction of any city or county, nor is it under the direct jurisdiction of a state agency. A district encompasses several cities and has territory within several cities and provinces. The special district is, therefore, a legally constituted governmental entity established for the purpose of carrying on specific activities within defined boundaries. The important roles that regional districts normally play lie in the integrated provision of local services such as water supply, sewerage, fire protection, hospitals, education, waste disposal, air quality, housing and community development, and drainage and flood control (Hawkins and Hendrick 1997). The frequent usage of special districts in these areas has to do with the fact that special districts are highly concentrated in a metropolitan area, in which public service delivery and economic development are main concerns.

In contrast to other types of regional governance, the distinctive features of special district lie in the motivation of its creation: the distrust of existing general-purpose local governments (Porter 1994; Stephens and Wikstrom 1998). There may be legal or operating inadequacies, or unwillingness by a government to perform certain functions (Bollens 1957). When provision of a particular service to residents does not fall to any existing local government, the functional need would be satisfied if a service area were to cover several existing units or boundaries. Special districts are not created primarily for dispute resolution in transboundary areas between local governments, which has been one of the main motivations for the creation of interstate compacts. Unlike interstate compacts, special districts usually cover several cities or suburbs (e.g., metropolitan districts), not state governments.

Despite the rapid growth of region-based approach, and their contributions toward the effective integration of intergovernmental problem-solving and service delivery, there are limitations to these region-based approaches. Interstate compacts have been criticized for their inflexibility and for the inherent slowness of negotiation and amendment decision making in the compact basically requires unanimity among the states involved, and a common denominator in the prescription of standards. And reliance on federal (or central government) funding can be another controversial issue between independent decision-

making power and lack of financial resources (Atkins and Wilson-Gentry 1992). In addition, fragmentation of government function means, in effect, that the entity has the potential to become yet another layer of ineffective government. This also is the case with special districts. Because their members typically are not elected, special districts are politically less accountable than other forms of government. Special districts, therefore, may weaken the ability of citizens to control government agencies or remove citizens from the decision making process (Hudson 1996).

Nevertheless, these potential drawbacks do not justify rejection of region-based approach to river management. The rationale for river-basin management (Martin et al. 1960) stems from the concept of a river as an organic system characterized by physical linkages and interdependence. This might be one of the reasons that environmental management on a basin-wide scale has expanded in number and scope in recent years (Rabe and Zimmerman 1995). River-basin water management requires a region-based approach, particularly for dispute resolution between river area governments. Furthermore, the river environment is tied to the lives of local communities, which means that management of the local environment should be undertaken with the perspectives of local communities in mind.

IV. Region-based Water Management

We have discussed the general features of region-based management approaches. Now it is time to focus on the field of water management. There are four general categories of water-related intergovernmental transboundary cooperation: water allocation, pollution control, flood control, and comprehensive water regulation and project development (Muys 1971). Among these, water allocation (water quantity) and pollution control (water quality) have been the most pressing concerns of water resource compacts. Indeed, these two issues have the foci of most of the previous water-related conflict resolution research in the disciplines of sociology, anthropology, economics, political science, and physical science (Mumme 1982).³ In most cases, water quality and quantity issues are interrelated. For example, water management system has usually relied on water from rivers, supplemented by regional water supplies. As a result, an increase in water demand in one region causes others to suffer from water shortages. As industrialization and population growth increase, river quality deteriorates, which aggravates the water-shortage situation.

Water-related compacts have used various approaches to ameliorate conflicts. While some of these have been simple water allocation or pollution protection compacts, others have

3) As for water quantity, the focus has been on the pressures on water supply due to increasing demands associated with industrialization, urbanization, and growing populations. Typical policy alternatives have been to develop water storage projects to serve watersheds, to control floods and to provide hydropower. As for water quality, groundwater quality degradation and pollution from industrial, agricultural, and urban wastes have been the main causes of water-related conflicts (Dinar and Loehman 1995).

been more sophisticated and comprehensive water planning and management agreements with commissions (e.g. the Delaware River Compact). While some compacts have only state members (e.g. the Great Lakes Basin Compact), others include the federal government as well (e.g., the Upper Colorado River Commission, the Ohio River Valley Water Sanitation Commission, and the Delaware River Basin Commission). Several prominent interstate compacts that have dealt with water management in the U.S. are examined in the following section (The comparison among them is shown in Table 2).

〈Table 2〉 Comparison of Interstate Compacts for Water Management

| | Colorado River Compact | Ohio River Valley Water Sanitation Compact | Delaware River Compact | Great Lakes Basin Compact |
|--|--|---|--|--|
| Involved parties (basin states or nations) | AZ, NV, CA, CO, UT, WY, and NM | IN, WV, OH, NY, IL, KY, PA, and VA | DE, NJ, NY, PA, New York city, Philadelphia, and federal government | IL, IN, MI, MN, WI, PA, NY, and OH |
| Main disputes or functions | Water supply issue due to constructing dam | Contamination of drinking water | Flood control, water supply, and treatment works | Water quality problems |
| Commission | Upper Colorado Basin Commission | Ohio River Valley Water Sanitation Commission | Delaware River Basin Commission | The Great Lakes Commission |
| Role of commission | Determining compliance of states with water allocation formula | Setting standards, performing assessments, monitoring, and conducting studies | Constructing and managing projects, apportioning water resources among states, and approving diversions and discharges | Stabilizing lake levels, measuring pollution, coordinating action in regulations, and diverting of water |

The Colorado River system was among the most hotly contested river basins. The River system was affected by two water compacts: The Colorado River Compact of 1922 and The Upper Colorado River Basin Compact of 1948. The 1922 Colorado River Compact was the first water allocation compact. Disputes among seven states along the river originally arose when the federal government proposed the construction of a dam in the lower basin (Arizona, Nevada, and California) to alleviate the problems of flood, drought, and sedimentation, and to provide hydroelectric power and other benefits. The proposal was opposed by the upper basin states of Colorado, Utah, Wyoming, and New Mexico for fear that it would endanger their rights to water from the river. The 1922 Compact contributed to the resolution of the conflict by creating an upper and lower basin apportionment formula (Thorson 1994).⁴⁾ Arizona’s failure to ratify it required the states to resume meetings

to reach an agreement to the compact. In 1948, the Upper Colorado Basin Commission was created after a water allocation formula was signed by the delegates of Colorado, New Mexico, Utah, Wyoming, and Arizona. The 1948 Compact was an improvement on the 1922 Compact, in that it established a permanent interstate agency, the Upper Colorado Basin Commission, consisting of one member from each of the participating states. The compact directs the commission to determine state compliance with the water allocation formula contained in the compact (Barton 1967).

In addition to water quantity, the water quality of the Colorado River has been a concern of both the Mexico and United States. At issue is water pollution due to the discharge of untreated or poorly treated sewage and industrial waste, resulting in widespread contamination or degradation of groundwater supplies. The problem stems from the lack of coordination capacity of the International Boundary and Water Commission (IBWC, a previously created bi-national institution) in the international boundary areas (Gaines 1995). A major source of dissatisfaction among U.S. border residents is that Mexican investment in sewage treatment lagged significantly behind that of the U.S., which caused serious pollution and imposed the substantial extra burden of treating Mexican sewage. The newly designed institution, BECC (Border Environment Cooperation Commission) was better at managing the international water pollution issue. One of the most distinctive features of the new commission is that regional communities play a major role in the river management. The governance structure is expected to consult with localities, non-governmental organizations, and other members of the public.

In the valley of the Ohio River, the intensive concentration of people and industry and consequent discharge of raw sewage and industrial wastes had produced serious pollution problems throughout the region by 1930 (Muys 1971). The problem became more serious with severe droughts of 1930s, which lowered the river's flow and made it unsafe as a source of drinking water (Berman 1962). In the face of these problems and regional disputes, the eight river basin states (Indiana, West Virginia, Ohio, New York, Illinois, Kentucky, Pennsylvania, and Virginia) finally ratified the Ohio River Valley Water Sanitation Compact in 1948. The compact created the Ohio River Valley Water Sanitation Commission (ORSANCO), which was entitled to exercise the powers and fulfill the duties specified in the compact. The commission operates programs to improve water quality in the Ohio River and its tributaries, including setting wastewater discharge standards; performing biological assessments; monitoring the chemical and physical properties of the waterways; and conducting special surveys and studies. The commission also implements several community involvement programs such as Friends of the Ohio, RiverWatchers, and River Sweep (www.orsanco.org). These programs encourage active citizen participation in caring for the Ohio River Basin. The main participating groups are, residents in the river's neighborhood, general public concerned about water quality, and other civic groups. The mission of

4) For details about the allocation formula, see Barton 1967.

Friends of the Ohio is to protect the natural beauty of the Ohio River. Friends create educational and recreational opportunities for the river's neighbors and inspire widespread commitment to this magnificent natural resource. RiverWatchers is a citizen volunteer monitoring program for the Ohio River and selected tributaries. The program includes 28 groups consisting of students and citizens who are concerned about water quality issues. Finally, River Sweep is an interstate water pollution protection agency for the Ohio River Valley, along with environmental protection and natural resource agencies from Illinois, Indiana, Ohio, Kentucky, West Virginia, and Pennsylvania. During 2001 and 2002, tens of thousands of volunteers from public organizations, civic groups, recreational clubs, and the general public in the six states, came together to collect thousands of tons of trash and other debris from the banks of the Ohio River. Overall, these programs are designed to educate the public about the nature of the pollution problem in the valley and to make the citizens and their governmental representatives concerned with environmental protection action.

As a domestic interstate water management compact, the Delaware River Basin Compact has been one of the most frequently discussed compacts in the U.S. (Martin et al. 1960). This compact has two distinctive characteristics. First, it is a comprehensive basin plan with an extensive management authority. The compact set forth agendas for basin-wide water planning, and coordinated development and management water resources. Thus, the compact covers both water quantity and quality issues: flood control, water supply, recreation projects, regional sewage collection, and treatment works for the basin. Second, this compact is the first federal-interstate water compact, in that it provides for an administrative entity with state and federal representation as well.

The compact was approved in 1961 by Delaware, New Jersey, New York, and Pennsylvania. Two cities (New York City and Philadelphia) and the federal government also joined the compact. Far from limiting federal government participation to granting consent, this compact allowed the government to enter into the agreement as an equal partner of the states. The single federal representative, unlike the federal representatives on other commissions such as the Upper Colorado River Commission, has taken on the responsibility of representing federal interests not of a single or a few agencies, but of all federal agencies (Berman 1962).

The compact vests the commission with the authority to construct and manage projects determined to be necessary, convenient or useful for the purposes of this compact (Thorson 1994). This includes the power to equitably apportion water resources among the basin states and to approve diversions and discharges beyond certain threshold amounts. A study by the U.S. Comptroller General concluded that the Delaware River Basin Commission has successfully managed a severe regional drought, adopted and implemented basin-wide water quality standards, and established basin-wide water policies (U.S. General Accounting Office 1981).

Another advanced type of regional water management coordination is represented by the Great Lakes Basin Compact. The basin area includes the greatest agricultural and industrial development regions in the country. Like the Colorado River area, the Great Lakes have both national and international agreements regarding basin area management. In 1972, the U.S. and Canada signed a Great Lakes Water Quality Agreement to address water quality problems resulting from land-based human activities (Colborn et al. 1990). A 1978 revision made the agreement more comprehensive. The new agreement took an ecosystem approach to the problems of the Great Lakes waters, recognizing that many solutions required programs focusing on the physical, chemical, and biological relationships among air, land, and water. Similar to the international commission of the Colorado River basin, this agreement paid much attention to citizen concerns and encouraged citizen participation in implementing the agreement.

The national compact went into effect in 1955, following ratification by five states: Illinois, Indiana, Michigan, Minnesota, and Wisconsin. Pennsylvania, New York, and Ohio joined by 1963. The concerns of The Great Lakes Commission, the compact's executive agency, are the stabilization of lake levels; measures to combat pollution, beach erosion, and floods; uniformity of navigation regulations; the coordination of action in fishing laws and regulations; the diversion of waters from and into the Great Lakes Basin; and the recreational use of water resources (Ridgeway 1971).

Like several previous river compacts, the Great Lakes Basin Compact emphasizes the roles of regional institutions in fostering integrated environmental management on a regional basis. One distinctive characteristic of this compact is that while in other compacts, state or local governments are motivated to create an interstate compact for the purpose of acquiring the power to act independently of the federal government, this regional approach intended to overcome regulatory fragmentation in the environmental management of several Great Lakes basin areas (Rabe and Zimmerman 1995).

V. Policy Implications for Region-based River Management

Water-related disputes have been one of the most salient natural resource management issues (Carroll and Hendrix 1992; Gladwin 1980). U.S. experience is saying that when the dispute occurs in a transboundary river area, a region-based river management approach, particularly interstate compact, is appropriate. Focusing on structural and procedural aspects in the abovementioned U.S. river management cases, policy directions of this study consider the coordination of river management, the role of national government, and public participation.

1. Coordination of river management functions

Intergovernmental joint efforts toward river management will require comprehensive coordination of the existing environmental management systems and agencies. When administrative or managerial entities are fragmented and have limited capacities in individual local governments, they are not easy to coordinate effectively, which could impede the region-based river management plan.

Several U.S. water management cases have focused on the promotion of coordination among agencies involved in water resources administration. Coordination has been one of the most pressing issues in water management in the Great Lakes Basin area. In the Great Lakes Water Quality Agreement between U.S. and Canada, the coordination issue became more complex when multiple levels of different national governments were included. In both countries, many of the daily tasks of environmental management and pollution control were in the hands of a large number of municipal and other local governments in each nation (Colborn et al. 1990). For example, the Council of Great Lakes Governors and the Great Lakes Commission lack any formal representation from the Canadian federal government. This environmental regulatory fragmentation might impede more integrated environmental regulation because it results in a fairly limited capacity to compel individual states, provinces, or industries to act in an integrated fashion. Those involved in regional policymaking face the challenge of fostering institutional coordination and providing greater direction toward integration of the various existing environmental management systems (Rabe and Zimmerman 1995).

Another example can be seen in the Delaware River Basin Compact, in which an executive commission has been instrumental in coordinating and integrating various functions. The administration of the Delaware River Basin Compact was placed in the hands of a five-member commission consisting of the governors of New York, Pennsylvania, New Jersey, and Delaware, and an appointee of the President to represent the federal interest (Martin et al. 1960). The commission was granted substantial administrative powers to coordinate the activities of all other agencies with water programs, and to integrate these programs into a comprehensive plan for developing and controlling river basin resources. The main functions of the commission are to plan, to design, to construct, to develop, to operate and to maintain all projects, facilities, activities and services. The commission also conducts and sponsors research: it collects, analyzes, and reports data on water resources and uses. In addition, the commission handles problems and issues that may arise between involved parties. Among these issues are whether to permit another party (or parties) to join the compact, and how to come up with a cost-sharing structure for environmental management.

2. Role of national government

Another coordination issue involves the relationship between local and national govern-

ments. The U.S. Congress identifies four areas of policy failure that have exacerbated water problems. One is lack of coordination between national and local programs dealing with water quantity and quality (Congressional Quarterly 1981).⁵⁾ Proponents of importance of the role of national government in the region-based river management contend that when and if intergovernmental water management takes an issue out of the hands of federal intervention, it might not be able to deal with all aspects of water management including representing a variety of interests, addressing various water quantity and quality issues, and the financial burden of management. Facing this, the U.S. federal government has involved in interstate water management (Davis 1996). However, federal involvement has made it difficult for states to protect their interests against the control of federal government.

How, then, can an interstate compact diminish the influence of federal regulation dealing with the state water? In the U.S., federal-interstate compacts have provided an answer to this question. The Delaware River Basin Compact is one of oldest and the most successful examples of federal-interstate compacts (Martin et al. 1960). In the compact, there was no danger that the federal government would control and regulate the compact because each of the four state representatives and their federal counterpart were equal partners (Briggett 1991). The advantages of federal participation in the interstate compacts are increased financial (e.g., cost sharing) and other resources (such as research on the Delaware River area). For example, the federal government, along with the other signatory states in the Delaware River Compact, undertook to bear a portion of the commission's annual and operating expenses budget (Muys 1971). It was agreed that Pennsylvania, New York, New Jersey, and the United States each were to assume 24 percent of the total budget, and Delaware, 4 percent.

National government participation can facilitate effective relations with other national governmental entities. The involvement of the national government in the committee could increase the likelihood that the plan would be approved by Congress. Furthermore, the representative of the national government could play an important role: that of liaison among the many agencies of the national government and state-run corporations.

3. Public participation

In the development of cooperative region-based solutions to localized water problems, a program of public participation would be particularly important. People are more likely to be interested in localized issues when they find these issues relevant and share common concerns with them. In the region-based river management, the free flow of information and ideas between stakeholders (e.g. residents in river area) and government officials can be an

5) The other three are: 1) The failure of water agencies to recognize the interdependence of groundwater and surface water; 2) Government policies that discourage conservation; and 3) The proliferation of cost-sharing arrangements for federal grants that have led cities to solve their least pressing water problems first.

essential element in the development and implementation of water policy in the river area.

The case studies examined in this study indicate the importance of channels of communication with the public. One of the U.S.-Mexico border environmental institutions presents one example: the Border Environment Cooperation Commission (BECC), a recently created U.S.-Mexico agreement, emphasizes local participation in its decision making process. The agreement calls on the commission to establish procedures to ensure public access to information and decision making: public availability of documents relating to any project in the Colorado River area, written notice and opportunity for public comments on certain crucial decisions, and a procedure for receiving complaints from groups affected by any project.

In another international context the Great Lakes Water Quality Agreement public participation has been a salient issue. There has been an increase in the number of basin-wide nongovernmental organizations and the use of stakeholder groups in developing environmental policy options. For example, the Center for the Great Lakes and Great Lakes United have assumed prominent roles in water management, not only as governmental watchdogs but as a means to practice vital functions (Donahue 1987).

The Ohio River Valley Water Sanitation Commission (ORSANCO) has developed community involvement programs such as Friends of the Ohio, RiverWatchers, and Ohio River Sweep. These efforts encourage active citizen participation in caring for the Ohio River Basin. The commission has produced several additional programs for the purpose of public education and public relations: for instance, pollution abatement program films were made available for group showings in the community (Barton 1967).

Based on the administrative schemes for public participation discussed above, several policy directions can be provided as following. First, as shown in the Colorado River case, a commission can be responsible for an extensive public participation program which encourages the involvement of the public in the planning process through formal and informal meetings such as special public hearings and neighborhood meetings. Second, like the Ohio River case, diverse policy communities might be useful to exercise influence over numerous aspects of environmental management in the basin area. This group consisting of a variety of environmental policy professionals may provide public with technical reports or summaries concerning environmental management. Finally, the most important thing is that in order to better get public involved in the river management process, their awareness and consciousness for the environmental management are needed. Residents of a river not only can review the draft of reports about the river management plan but also can assist authorities by looking out for surreptitious release of pollutants by industries in the area.

VI. Conclusion

In a transboundary river area, a region-based approach would play an important role, in that the river can cross municipal or regional boundary lines. The approach makes it possible to shift the river management functions from the national government to regional local governments. The rationale for regional governance stems from the concept of a river as an interdependent organic system where effluent pollution in one part of a river may well affect the quality of water in other areas.

Recently in Korea there are several cases where harsh regional conflicts have been revealed among local governments particularly in environmental issues. The Naktong River is one of the examples experiencing a serious regional conflict between upper and lower regions. Unfortunately, the region-based approach has not been easy in Korea. The concentration of power in the central government in the past several decades prevented Korea from exhibiting regional cooperation in managing disputes. Stephens and Wikstrom (1998) found that a greater level of state centralization of services is negatively associated with region-based governmental activity. This tendency has led to serious shortcomings in the protection of environmental systems (e.g., rivers), especially those that have transboundary characteristics.

It is, therefore, not surprising that in Korea, few major mechanisms or institutions have been created for the purpose of intergovernmental cooperation on important environmental issues. As intergovernmental environmental disputes are increasingly occurred, we need to look for regional governance as a means of resolving those disputes. Recently 'watershed management committees' were established in four major river areas in Korea. One of the main roles that these committees are expected to play is to improve the water quality and resolve disputes by making intergovernmental cooperative efforts among governments in river area. It is too early to evaluate the contribution that these committees have made for river management. Instead, it might be meaningful to discuss what policy alternatives are recommended to implement for regional cooperative river management.

Comparison among the three region-based approaches for water management suggests that interstate compact is the most relevant for river management, especially for resolving regional dispute in water area. Comparing with others, interstate compact gives more political power to local governments. Sub-national governments such as state or local governments are entitled to wield the power for initiation, negotiation, and implementation of compacts in dealing with their regional issues. Increasing number of interstate compacts indicates usefulness and relevancy of this structure. During the last over 30 years, interstate compacts have experienced a marked increase in the field of river management, which suggests that interstate compact seems to be an appropriate tool in the management area.

By contrast, regional council does not guarantee independence from national government in an intergovernmental partnership between local and national governments. It means that

regional council is not a proper organization to draw any consensus for regional environmental cooperation from 'regional' viewpoints. Special district has also a functional limitation because of a geographical issue. Special district is not created primarily for dispute resolution in transboundary areas between local governments because the district usually covers several cities or suburbs, not state governments.

However, drawbacks of region-based approaches exist. First, there is an inherent limitation that usually occurred when multiple stakeholders are involved in decision making process. Interstate compacts are slow in negotiation and amendment because decision making in the compact basically requires unanimity among the states involved. Secondly, the compact contributes in creating another layer of government, which may make the previously existed government function ineffective. Nevertheless, the recent expansion in number and scope of the regional approach shows that those limitations are not enough to reject the region-based approach for river management.

After surveying examples of water management in the U.S., several policy directions for the region-based intergovernmental cooperative river management were presented: integrated river management, involvement of national government, and public participation in river management. U.S. experience has found that those policy alternatives are also useful for resolving water disputes in a river area. These policy directions can hopefully show ways that can be properly applied to settle any intergovernmental environmental disputes in water area.

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김기환 : 2002년 인디애나 대학교에서 행정학박사를 취득하고, 현재 연세대학교 도시문제연구소 연구원으로 있다. 주요관심분야는 공공관리와 환경정책이고, 주요논문으로는 Measurement of Water Quality At Work: Looking For Policy Implications of Contingent Valuation Method for Water Management, Exploring the Role of Representation in Employment Mediation at the USPS, International Regime for Trade in Hazardous Wastes 등이 있다.