OPTIMIZING SCIENCE-POLICY-PRACTICE INTERFACE FOR INFORMED WATER POLICY IN THE TRANSBOUNDARY MEKONG RIVER BASIN

	Sokhem Pech
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	Tohoku University
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	ソクヘム　ペチ
氏　　　　　　名	Sokhem Pech
授　与　学　位	博士（学術）
学 位 記 番 号	学術（環）第２１号
学 位 授 与 年 月 日	平成２４年７月３日
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論 文 審 査 委 員	主査　東北大学教授　風間　聡　　東北大学教授　境田　清隆 東北大学教授　藤崎　成昭　東北大学准教授　李　玉友

論　文　内　容　要　旨

The study focuses on the Mekong Region (MR) that is experiencing rapid changes from exponential increase in economic development activities potentially requiring that the development decision must be more knowledge-intensive and more participatory. The researchers, policy makers, basin managers and communities at large really need to know more and timely for ascertaining or convincing each other with plausible and accepted evidence about these complex relationships to build a consensus for action.

In the Mekong Region (MR), from the literature review, field survey, critical analysis and validation conducted by the present study, over the past 60 years numerous efforts have been undertaken by the Mekong countries and other Mekong related research groups aiming at producing and applying scientific and other knowledge related to water and related resources in various river basins in the Mekong Region. But in spite of that, the availability and permeability level of usable knowledge and tools in decision making remains one of major constraints facing the national and regional institutions in charge of sustainable development of this great international river basin.

While the lack of high amount and high quality of knowledge for informed analysis and decision makings remains critical, the gap in the evidence based or informed decision-making is considered by this study as the most critical one since it restricts the application of the available knowledge and tools and hence makes huge investment and efforts for knowledge management very ineffective.

There is an urgent need to explore, understand, and communicate the components of successful knowledge management for sustainable water development. In spite of non-linear and sometimes even illogical model of knowledge management, and diversity and priority issue, it has been recognized by many researchers, policy-makers and practitioners in the region that there is an urgent need for ensuring timely and better decision so that development can proceed smoothly and benefit and impacts are properly distributed and mitigated.

Interface is a key Concept of this study, and is generally referred to the point of interaction or communication between two entities such as information/knowledge producers, communicator and users. It covers how scientific knowledge and other validated knowledge are used to inform decision by the relevant decision-makers at different level and scale (from household, community, local, national, regional and global). The present study presents a first real systematic study for developing and trying the tools built around an appropriately standardized or custom-designed index to bridge science, policy and practice interface for sustainable development of the river basin's water and related resources in the Mekong Region, and potentially globally.

Chapter 2 provides a well-documented comprehensive analysis of the role of knowledge in designing and implementing activities and process contributing to effective transboundary environmental governance. The diagnostic analysis points to the required design principles and mechanism that have to rely on the intensive use of knowledge in the effective decision making and management.

The Mekong Region typology analysis demonstrates different ecological zones with prevailing difference in development potential and challenges, multiple scales and multi-stakeholders at regional, national, sub-national and local level, and diversity in social, political and cultural traditions and views. Diversity and harmony define the ranges of perspectives in Mekong Region's natural resource management and knowledge management. This diversity in harmony is taken into account in this study.

Secondly the review and analysis has found that the decision-makers perceived population growth and associated demand change associated with population and other fundamental social, economic, and political factors as the main justification for water and related resources rapid development. Appropriate assessment framework and usable knowledge, and assessment and monitoring tools are needed for considering at the earliest possible stage of planning, the impacts at a basin-wide level, predicting cumulative impacts over space and time, and supporting collaborative decision on mitigation and trade-off.

Chapter 3 provides qualitatively and quantitatively analyses the knowledge management practice and perception by selected three major groups of stakeholders that are considered representative enough for this diverse group of key actors in the Mekong science-policy-practice nexus or interface. The results testify the complexity and multiple linkages of various scientific disciplines and topics called for providing knowledge and

ascertaining facts for preventing and solving identified issues. It is worthy to note the uniformity of issues raised by researchers, policymakers and practitioners about poor permeability of knowledge into decision-making process are caused by multi factors – capacity and attitude, limited human resources and partnership, perception about relevance and salience, and prevailing political and cultural environment. The analysis concludes that an optimization of the interface and uptakes of knowledge for informed decision-making require a systematic approach towards improving readiness by relevant players and actors in the interface, capacity development, communication, engagement, and sustainable measures for instilling culture, political environment and behavior toward sharing, appreciating and applying knowledge in decision making.

CHAPTER 4 presents the process and outcomes of the development and trialing of the tool for evaluating and measuring improved interface for knowledge uptakes for decision making. This measurement tool proposed by this study is called "Best Knowledge Management Practices Index (BKMPI).

It is challenging to assess qualitatively and quantitatively the direct social and economic impacts of the knowledge utilization, as the permeability of the knowledge depended on a number of key indicators. To measure enabling condition, it would require employing behavioral study approaches (neuroscience) using systematically measured variables, and statistical techniques. To qualitatively and quantitatively assess the interface and capacity (enabling environment) to affect behavior change for informed decision-making, at least four basic parameters: 1) attitude of all key players toward knowledge management; 2) communication/transmission quality, 3) institutional and regime effectiveness where policy makers and communities are able to appreciate knowledge to address existing and emerging problem; and 4) users' capacity and attitude to appreciate and apply them - are deciphered from the collated data and information. Quality of knowledge (vigor, trust, relevance etc.), communication, dialogue and or involvement at various stages of research such as setting research questions and priority, commissioning of research, and validating and communication of the findings. Such assessments can be derived from multiple data sources, including documentary evidence, data-sets, surveys and interviews and in-depth case studies.

The study applies a conceptual model of a multi-directional and multi-faceted interaction and connectivity among key actors in science-policy-practice interfaces in knowledge production (research design, planning and implementation), transmission and application, and other influencing factors, namely push and pull factors. Table 4.2 in the dissertation presents the indicative dimensions, indicators, variables and means for verification, as well as the examples of evidence, defined, refined and fine-tuned through the development and trialing process during this study from August 2009 to May 2010.

The BKMP Index is a mathematical aggregation of dimension, indicators and variables that are important to forming a view on the overall effectiveness of the interface at each point in the knowledge management life cycle. Its aggregation is done by combining all relevant components by scaling and weighting processes. Its development has benefited from the

BKMPI process tree that comprised of four inter-related phase, namely, i) setting goals; ii) nomination phase; iii) analysis phase; and iv) action phase.

The study attaches careful thought on how numerical indicators of interface performance were to be used. The study uses numerical indicators as tin openers to aid judgments, and to facilitate comparison. It is primarily based on scoring perceptions using a coding system which can then be quantitatively analyzed.

Each indicator receives a score from level 1 to 5. For some indicators, there are multiple variables' (means for verification) scores which were aggregated to determine the indicator score. The indicator scoring required identification and comparing against the benchmarking or evidence/body of evidence that had to be met to receive a particular score. It is important that it is retrievable or reproducible, is not influenced by emotion or prejudice, and is based on facts obtained through observation, measurements, documentation, tests or other means. The personal observation and assessment can be then validated through facilitated Delphi method.

For sensitivity analysis, the criteria weighting coefficients can be assigned both equal weight, and different priorities weighting scenarios. The users may change the set of variables and indicator, and their weights (weighting coefficients) as they consider appropriate. In this study, for ranking of overall score, the study applied "weighted summation" technique where the performance measures are multiplied by the weights, and then summed for each option to obtain an overall or global intensity index of each related issue.

The overall outcome of the assessment could be presented in a summary table and as a standard figure presenting the high and low variable scores for each indicator. The indicator scoring bars also show an asterisk indicating where the level of effectiveness, efficiency, reliability and quality score (lowest and highest of all variables) is, as well as the predominance of the scoring level.

From its trialing, it is clear that BFKMPI has the potential to play an important role in enabling relevant stakeholders to monitor and redesign their knowledge management strategies and programs relying on factual, reproducible, objective and verifiable evidence to meet sustainable development objectives and for improving performance and promoting dialogue.

The assessment can be conducted either internally for self-assessment or externally as part of auditing process by the independent auditor(s) or assessor(s). As other scientific tools there are both potentials and limitations. The potential users and uses include the researchers, scientific groups, knowledge managers and users, governments, potential financiers, other decision-makers, private sectors, and civil society organizations involving in the knowledge production, communication and application. However, it is best to be used by individual who are a specialist of relevant knowledge management and scientifically informed policy process topic and also receive special training for applying BKMPI. In application of the tool,

credibility of the assessment depends on how much information is disclosed by the assessed entity to the assessors.

To minimize diverse viewpoints with regards to attributes and aspects subjectively (personal preference, education and cultural background and institutional affiliation), the assessment results have to be challenged through rounds of additional peer-pressure and review process using evidence-based collaborative deliberation.

Key Recommendations

It has become increasingly obvious that there is an urgent need for greater cooperation in the Mekong Region, and greater interface between science policy and practice. The effective mechanisms for such cooperation and interface need to be further strengthened or established. Appropriate assessment framework and usable knowledge and prediction and monitoring tools are needed to support and enable decision-makers and practitioners in mapping actions and working toward achieving the broad concept of sustainable development and equitable utilization.

This study has informally tested and trialed this BKMPI in an academic and informal setting leading to the finalization of this dissertation. It is important that a more concerted effort should be made to conduct trialing and familiarizing the tools in a more formal and semi-official setting. This undertaking will need a functional program and regional center to lead and coordinate the trialing process and document the outcomes.

The key players and funding agencies operating in the Mekong River Basin have to consider and secure programme for promoting this systematic assessment tool – BKMPI - to generate and widely share with the donor community, research community, policy makers, and broader community for monitoring the interface and improving uptake of knowledge for decision making and practice. The role of mechanical and social means for communication and interaction for data, information and knowledge sharing and exchange and the skill and capacity for communicating and absorb required knowledge should be the key focus for any future knowledge management programme.

More research is required to explore best modality and options for improving the characteristics of policy making styles that would support a strong recourse to and use of knowledge and scientific advice within the social and political context of the Mekong countries.

論文審査結果の要旨

　メコン域は急速な発展によって生態系の破壊と水紛争の可能性を秘めており、政策決定には、より確かな知識に裏付けられた利害関係者参加型が求められている。そのために、水資源と関連資源の持続可能な開発のための科学、政策、実務間のインターフェイスの橋渡しをするツールの開発と試行、検証を実施した。

　第1章は、序論である。

　第2章は、過去のメコン流域における意志決定と政策実施の過程やその問題点を収集し、本研究の重要性と独創性について言及した。

　第3章では、流域開発において様々な知識の活用の評価を、メコン域の人口増加と環境への取り組みに関する科学的議論の分析により実施した。その結果、都市化に関する理解不足と自然資源開発に頼る経済発展における成長は、メコン域における自然・社会システムの影響と変化について不確実性を増加させていることと、人口規模は土地利用変化の重要な決定因子の一つであることが示唆された。メコン河の開発シナリオの影響評価は、水力発電推進者と意思決定者によって広く共有されていない。また、モデルが氾濫域の変動と推定された漁獲量の変動傾向を合理的に見つけることを示した。

　第4章では、まず、科学―政策―実務間の接点（インターフェイス）での知識の伝達と適用において、要素間の多方向で多角的な相互作用および接続性の概念モデルを開発した。その中で、プッシュ（知識提供）要因とプル（知識受容）要因は重要な提案である。
最適知識管理実務指標（Best Knowledge Management Practices Index(BKMPI)）の開発では、接点性能の数値指標への利用について慎重に検討し、その点数化を実地調査によって行った。数値化と順位化によって、様々な指標の変数に重み係数が与えられる。ユーザーは適切な検討のために変数と指標、重み係数のセットを柔軟に変更することができる。評価手法の試行結果、BKMPIは、寄贈者、研究コミュニティ、政策決定者が知識管理戦略の経過を把握し、修正できるよう事業が持続的な開発に沿うようにするために重要な役割を果たすことが明らかになった。この評価は、組織内部の自己評価または外部の監査過程の一部として実施することができる。

　第5章は、結論である。

　以上要するに本論文は、政策決定の評価のためにより客観的かつ定量的なBKMPIを開発し、その有効性を示した。本手法の成果は、メコン河に代表される国際河川の政策決定に大きく貢献できる成果であり、本論文は博士（学術）の学位論文として合格と認める。