

Water tenure analysis in Nui Coc Irrigation System in the Red River Basin, Vietnam

Le Van Chinh¹

Abstract: Vietnam is considered to have a sound legal systems for water resources management but the enforcement of these systems remains limitations. This weakness and its causes were reported in various studies on institutional arrangements. However, the clear relations among stakeholders with respect to water resources, or water tenure, and level of implementation of water tenure governance which are related to these limitations remain undocumented. Using the new approach on water tenure analysis to identify issues and conflicts related to water tenure arrangements in a pilot area in Vietnam is the aim of this study. Most of the types of possible formal (8) and informal (7) water tenure arrangements were identified in the pilot area. The analysis of the water tenure governance in terms of 14 aspects and assessment of water tenure security were conducted in the study area. The study results illustrate the needs to improve the implementation of law enforcement and to strengthen the process of water tenure governance. Based on the analysis results, several relevant solutions are recommended including review and update of current legal framework and strengthening the enforcement of current legal regulations in Vietnam.

Keywords: Water tenure, institutional arrangements, governance.

1. Introduction

Improved water resources monitoring, allocation and management is important for addressing water scarcity in the context of climate change and socio-economic development in Vietnam (2030 WRG, 2017). As water is a vital factor for life on earth, it is relied upon by numerous sectors and users (Faurès et al., 2003). Thus, effective water resources management requires sufficient information and understanding about these different water uses and users. In fact, this significant information is often lacking leading to unsound decisions on water resources management. In addition, although legislation framework for water resources management exists in most countries, the extent of implementation of the framework is often not

clear. Also, many shortcomings in the legal recognition of communities' water rights have been indicated in current studies (Blake and Robins, 2016).

Although there is growing awareness of the urgent need to address water scarcity challenges, information is often lacking about how people access and use water resources in practice. At the same time, although legal and policy frameworks for water resources management exist in most countries, the extent to which these frameworks are implemented is often unclear. Nor is it always obvious how well such frameworks are effective or adapted to the local reality of managing and using water resources and facilitating equitable access to water. A commonly used definition of *water tenure* is that it is “*the relationship, whether legally or customarily defined, between people, as individuals or groups, with respect to water resources*” (Hodgson, 2016). In other words, water tenure arrangements determine how

¹Thuyloi University
Received 29th Sep. 2022
Accepted 2nd Nov. 2022
Available online 31st Dec. 2022

people, communities and organizations can access and use water resources on the basis of rules, rights, custom, practices and procedures (hereafter described as 'water tenure arrangements').

With the impacts of climate change and continued population growth, demand for water and water resources is projected only to increase. The issue of water tenure, and more specifically water tenure security has never been more important. Not only do weak and insecure water tenure arrangements lead to the risk of conflict, but they also constrain economic growth, given that people without secure water tenure are usually less likely to invest in developing water resources (Hodgson, 2016). Weak and insecure water tenure arrangements can also threaten the very livelihoods of those who depend directly upon water resources for inland fishing, agriculture and ecosystem services.

There have been a number of studies in institutional arrangements on water resources with a relation to water tenure. The management and development of water resources must follow a participatory approach involving stakeholders, especially users and policymakers at all levels (Miguel and Villarreal, 1999). In 2000, Bandaragoda proposed the idea of developing a contextually appropriate and adequate institutional framework, essentially through a participatory approach involving all stakeholder groups. Hussain et al. (2007) argue that as water scarcity is increasing, more effective organization and management is becoming a very important issue. Meanwhile, the studies of Lorite et al. (2007), of Murat Kilic and Suer Anac (2012) suggest that the management of water resource exploitation serves multiple purposes and on a large scale that requires the management organization to start from the planning for exploitation management at

regional and river basin level with the participation of stakeholders.

In Vietnam, there are a number of relevant studies on water tenure in terms of formal laws at the national and river basin levels. Nam et al. (2013) and Tien et al. (2016) provided an assessment of institutional arrangements and confirmed that the establishment and enforcement of a legal framework is a critical factor in a government's efforts to achieve sustainable water resources and socio-economic development. Also, as stipulated by the current law on water resources, at the river basin level, water resources was managed by River Basin Organizations (RBOs) under Integrated Water Resources Management (IWRM) approach (Nam et al. 2013). However, in practice, it was indicated by a study by World Bank (2019) that the implementation of IWRM in river basins in Vietnam has confronted with many challenges and obstacles. There have been no formal ROBs in Vietnam, although some large river basin as Red, Dong Nai and Mekong delta have an organization of river basin planning management (MONRE, 2021). Moreover, MARD (2021) reported that actual roles and functions of these organizations were limited without decision-making in water management, and only focusing in sharing information via meetings and seminars.

At the lower water management level, Tuan and Thinh (2015), in their study on improving the efficiency of water management in Gia Binh irrigated area, Bac Ninh province, proposed a participatory management approach at on-farm water management including aspects of development of system management strategy, improvement of the decision-making process in construction investment, rehabilitation of water facilities and capacity building of water user organizations. Loi (2014) suggested that institutional arrangements and policy were important measures for improving the

performance of current water facilities. Chinh (2020) recommended several solutions to policy and institutional arrangements for enhancing water use efficiency in irrigated agriculture via a study on water policy and institutional aspects in 14 provinces in Vietnam. However, so far, there have not been any studies on the comprehensive assessment of water tenure and level of implementation of water tenure governance in Vietnam.

Although there were a number of researches related to water tenure, so far, there have not been any comprehensive methods for water tenure analysis apart from the one, which recently has been developed by Food and Agriculture Organization of the United Nations (FAO, 2020). This approach will be described in detail in the methodology section.

Thus, this study is to carry out a water tenure

assessment in an irrigation system in the Red River Basin (RRB) aiming to figure out the types of water tenure arrangements, the enforcement of current legal framework related to water tenure arrangements, as well as identify any issues and conflicts related to water tenure. Furthermore, the recommendations for the revision of legal framework and improvement of law enforcement are given.

2. Methodology and materials

2.1. The methodology

The aim of a water tenure assessment is to identify and analyse water tenure arrangements in an assessment area. For this purpose, the research framework including both desk-study and field investigation to identify existing issues on water tenure in the study area is applied (Fig.1).

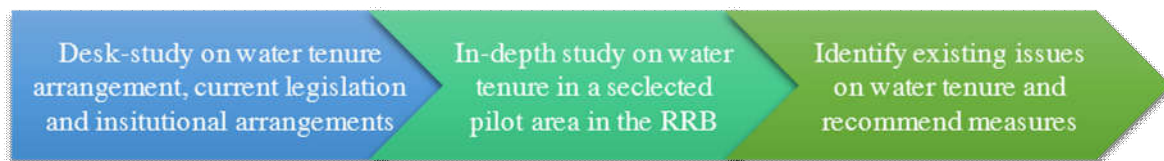


Fig. 1. Research framework of water tenures assessment in Vietnam

The detail methodology of water tenure arrangements was developed by KnoWat project by Food and Agriculture Organization of the United Nations (FAO, 2020). The methodology sets out a six-step process for the undertaking of a water tenure assessment as follows.

Step 1 - Preparation: During this step the assessment team, is assembled and trained, proposals regarding the assessment area and research areas are finalised and preliminary legal, water use, water user, governance and field research is undertaken.

Step 2 - Scoping: The initial findings from the preliminary research, including the proposed field research areas, are presented to key stakeholders at a scoping meeting. The step

aims at identifying the scope and the guiding questions of the water tenure assessment.

Step 3 - Research: More in-depth legal and governance research (desk study, interviews, field visit) is undertaken and two rounds of field research.

Step 4 - Analysis: In this stage the findings are assembled and evaluated, a range of analysis activities will be undertaken on the basis of six separate tasks.

Step 5 - Validation: The findings of the water tenure assessment are presented for feedback, comment, and revision to different groups of stakeholders.

Step 6 - Reporting: A final water tenure assessment report and summary is prepared, including conclusions and recommendations.

Under this methodology, it was first required to identify as far as possible the different types of water tenure arrangement existing in the country as well as related uses on the basis of the typology of water tenure arrangements. Then the existing legal and institutional arrangements are reviewed to undertake a preliminary governance assessment before identifying pilot area to undertake initial stakeholder mapping to prepare a first-cut stakeholder analysis on water tenure arrangements in the pilot area, mapping the types and status of uses and users and the rules governing access to water for each. Finally, water tenure arrangements are assessed in the field of the implementation of the relevant legislation.



Fig 2. The six steps of a water tenure assessment

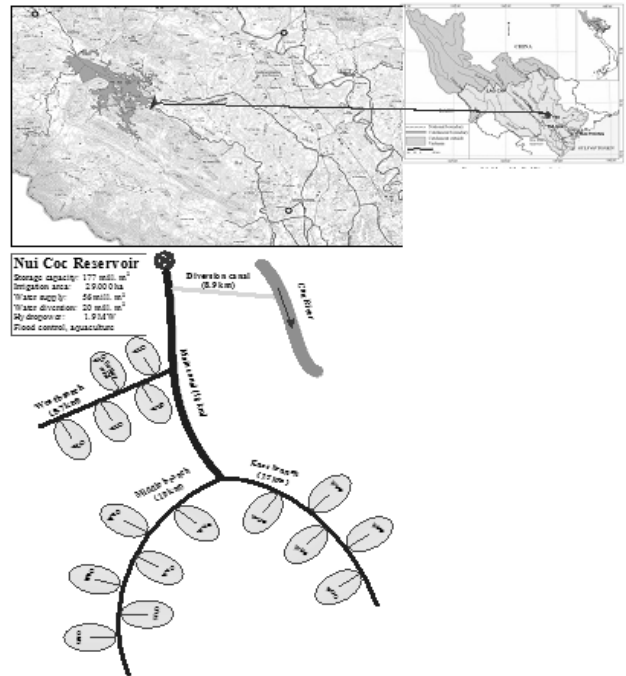


Fig 3. Nui Coc pilot area in the RRB, Vietnam

2.2. The pilot area selected

The Nui Coc pilot area is concerned primarily with the management of water in an irrigation scheme (Fig 3). This is a typical and large-scale irrigation system in the RRB providing water for multi-purposes as drinking water, irrigation, aquaculture, hydropower, water diversion, recreation activities. The scheme irrigates up to a maximum of 13,000 ha in one cropping season and 29,500 hectares annually and the infrastructure is also used to supply some 56 million m³ of water each year for drinking water supply and industry, hydropower generation, water diversion to maintain flows on the Cau River, flood control as well as enabling aquaculture and tourism/recreation (Thai Nguyen IDMC, 2021). Moreover, due to the quantities of water involved, the way the irrigation system is managed and the manner which the abstraction/diversion of water into the system takes place, the water tenure arrangements within the scheme, have a clear relationship to other water users in the RRB.

3. Findings of the study

3.1. Legal framework

Viet Nam have recent and rather comprehensive water resources laws in place. The Law on Water Resources was adopted in 1998 and revised in 2012 to create a comprehensive legal framework for water resources management. This law contains 79 articles in ten chapters seeking to give effect to integrated water resources management and provide that the river basin is the basic management unit. The law provides for the establishment of river basin organisations, although both provide for provincial authorities to be responsible for the management of water resources within river basins that lie entirely within their administrative boundaries. The law also provides for the development and periodic review of river basin plans as well as the

issuance of water use permits, while providing for the possible establishment of minimum/environmental flows. Nevertheless, as the study clearly shows, neither text can yet be said to have been fully implemented, whether in terms of the adoption of the necessary subordinate legislation, or as regards preparation of river basin plans or the completion of the water use permit issuance process in the country. At the same time, it is clear that the water resources law is far from being the only source of formal water tenure arrangements in Vietnam.

3.2. The diversity of tenure arrangements in the pilot area

A key finding concerns the sheer diversity of water tenure arrangements in the pilot area which in turn tends to confirm the basic water tenure typology given by FAO current studies set out in Table 1 (FAO, 2020).

Table 1. Typology of water tenure arrangements in study area

Typology of water tenure arrangements	In Vietnam	In Nui Coc
<i>Water tenure arrangements created on the basis of formal law</i>		
‘Traditional’ formal water rights	N/A	N/A
‘Modern’ permitted based volumetric formal water rights	x	x
Regulatory licenses	N/A	N/A
Agency control	x	x
Water supply contracts	x	x
Commonhold tenure	x	x
Investment contracts	x	N/A
<i>De minimis</i> rights – small scale	x	x
Declared/exempt commercial uses	x	N/A
Reserves/minimum flow requirements	x	x
<i>Water tenure arrangements that do not derive from formal law</i>		
Customary water tenure	x	N/A
Religious law water tenure	x	x
Informal arrangements (1) deliberately illegal	x	x
Informal arrangements (1) evolved over time	x	N/A
Assumed water rights	x	x
Impossible water rights	x	N/A
Unrecognized tenure	x	N/A

Recent research indicates several types of *water tenure arrangements created on the basis of formal law*. The desk-study based on available documents related to current institutions and legislations in Vietnam's water sector points out that, there are 8 categories of water tenure arrangements existing in Vietnam while from the field investigation, 6 types of water tenure arrangements are in Nui Coc irrigation system.

For *water tenure arrangements that do not derive from formal law*, based on available documents related to current legislations and its implementations in Vietnam's water sector, it were pointed out that, 7 categories of these water tenure arrangements are existing in Vietnam and 3 in Nui Coc irrigation system.

In Viet Nam, all of the types of possible formal water tenure arrangement were identified apart from "*traditional*" *land-based formal water rights* and *regulatory licences*. The absence of the former type of arrangement is because in this country where all land is owned by the state. The absence of the latter arrangement is explained by the fact that water use permits issued under the water resources law last for more than three years. Other interesting points to note are as follows. First, an interesting finding from the Viet Nam study is the continued relevance of customary water tenure and religious water tenure in this country.

Religious tenure continues to play a role in terms of the many villages in Vietnam that have a dug-well, or pond in their pagoda, a temple from which the water is considered as a gift from the nature bringing good fortune. Various kinds of informal tenure arrangements were identified in pilot area under a range of scenarios including abstractions on the basis of expired permits and a failure to account and pay for water taken from within the irrigation scheme in Viet Nam.

At the same time there are numerous

examples of ambiguous water tenure arrangements including "assumed" water rights in cases where it is assumed that public bodies benefit from formal water tenure arrangements. This seems often to be the case in the Vietnamese pilot study as regards the abstraction of water for irrigation use by state-owned enterprises of legally "impossible" water tenure arrangements in the case of water user organisations (WUOs). That is because WUOs do not have formal legal status and therefore they are legally incapable of holding any kind of formal water tenure arrangement. In Vietnam, the plethora of water tenure arrangements in the pilot area results in implementation challenges for water legislation.

3.3. Implementation challenges

The failure to fully and effectively implement the legislation on the statute books emerged as a key issue in Viet Nam, one that has important impacts in terms both of the diversity of water tenure arrangement that do not derive from formal law and also as regards the relevant security of water tenure in the pilot area. Although neither of the study directly investigated the issue, it would appear that under-funding is a major reason for this in that the relevant ministries have nowhere near the resources they need to monitor and allocate water resources or to issue and enforce permits.

As already described, in Viet Nam, although the water resources law requires the abstraction and use of water resources to take place on the basis of a water use permit, such a permit has only been obtained for one of the four main facilities in the pilot area namely a hydropower dam. This means that the irrigation scheme itself and two water supply systems are operating otherwise than in accordance with the water resources law, on the basis of either assumed or informal water tenure arrangements. Moreover, countrywide more than some 35% of facilities actually hold a water use permit as

required by law. This figure was estimated on the data provided by report from Ministry of Agriculture and Rural Development (MARD, 2021) and from Ministry Ministry of Natural Resources and Environment (MONRE, 2021).

However, the implementation challenges relating to water legislation are not confined to issues of permitting. The water resources law provide for water resources to be managed on the basis of river basins by river basin organizations and on the basis of river basin management plans. The country faces significant implementation challenges in this regard.

3.4. Institutional arrangements in water resources

As is usually the case, a range of different public agencies are involved in aspects of the management, development and use of water resources. In Viet Nam legislation relevant to the management and protection of water resources include: (i) the Law on Water Resources (focal point); (ii) the Law on Environment Protection; (iii) the Law on Land Use; (iv) the Law on Hydraulic works; (v) the Law on Dyke Management; (vi) the Law on Natural Disaster Prevention and Control; (vii) the Law on Forestry; (viii) the Law on Electricity, (ix) the Law on Fisheries; and (x) the Law on Planning.

Each law is in turn implemented by a separate agency. While the Ministry of Natural Resources and Environment (MONRE) is responsible for the implementation of the law on water resources, the Ministry of Agriculture and Rural Development (MARD) is responsible for irrigation, aquaculture and associated hydraulic infrastructure, river training, flood control, rural water supply and sanitation, and coordinating disaster response, including management of riverbank and coastal landslide and the system of dikes for flood control. The Ministry of Industry and Trade is responsible for

hydropower and water for industry and cooperates with MONRE and MARD with regard to the release of water from hydropower reservoirs for irrigation in the dry season. The Ministry of Construction is responsible for the governance of water supply for urban areas and industrial zones, drainage and wastewater treatment in urban areas and concentrated rural residential areas while other relevant ministries include the Ministry of Health, which is responsible for providing technical guidance for urban and rural water supply and for inspections, the Ministry of Finance which issues guidelines on taxes and fees related to water, wastewater and drainage, the Ministry of Transport which is in charge of managing and developing navigation, inland waterways and ports, the Ministry of Science and Technology which is responsible for setting water quality standards and for promoting technological innovation and the Ministry of Planning and Investment, which synthesizes investment projects on water resources, provides the budget plans and submits these to the government for approval.

3.5. Challenges of water tenure governance

These legal and institutional frameworks in turn result in complex governance challenges which in turn may partly explain the low scores for governance in of the pilot area. At this point it is important to note that the purpose of the governance assessment, which step four of the methodology calls for, is an attempt to assess the extent to which the legal and institutional arrangements are effectively implemented as this will directly impact on the relative security of different types of water tenure arrangement.

Apart from requiring an assessment of the extent to which formal water tenure arrangements are actually implemented in the assessment area, 14 aspects of water tenure governance addressed include: (i) the extent to which formal water tenure arrangements are

recorded, (ii) the monitoring and measurement of water resources, (iii) the extent to which river basin plans have actually been prepared as required by the water resources law, (iv) the existence of mechanisms for user participation in decision making and so on. Each of total 14 issues is described and scored on a scale of A

(being the highest level) to D (being the lowest level) to give an approximate idea of the extent to which the governance mechanisms required by law and necessary for water management are actually implemented. The findings above from the scale of water tenure governance in the pilot area are summarized in Table 2.

Table 2. Results of water tenure governance assessment in the pilot area in Vietnam

Scores	Number of aspects of water tenure governance
A scale	1/14
B scale	8/14
C scale	5/14
D scale	0/14

The largest number of B classification are 8 out of 14 aspects indicating that arrangements for the governance of water tenure in this area are in place but there is scope to improve implementation e.g. law enforcement, inspection, climate change, flood/droughts. The second largest number of C classification are 6 illustrating that these some measures for the governance of water tenure have been implemented e.g. planning, gender issue and water quality. However, there is a need to strengthen and expand the process of water tenure governance. In fact, only the human rights angle is in place and implemented effectively. This proves that the governance of water tenure clearly recognizes the human right to food and water. These findings imply that it is necessary to improve and even strengthen the implementation of water tenure governance in the study area.

3.6. Security of water tenure

Using the similar ratings of water tenure governance with 4 levels as mentioned above,

an attempt was next made to assess the relative security of formal water tenure arrangements in the pilot area. For this purpose, four levels are used again, though in terms of the level of security as the following:

Level 1 - Secure water tenure (legally and secure in practice)

Level 2 - Relatively secure water tenure (limitations to security, either legal or in practice)

Level 3 - Limited water tenure security

Level 4 - Very little to no security of water tenure

The findings from the pilot area point out clearly that none of the tenure arrangements were assessed as Level 1, secure. In fact, in Viet Nam five types of water tenure arrangement were assessed as relatively secure, three as having limited water tenure security and two as having very little to no security of tenure (Table 3). This indicates the limitations in the current legislation and/or legal enforcement in the study area.

Table 3. Analysis of the security of water tenure in the assessment area in Vietnam

Types of water tenure	Level of security (1-4)	Description
“Modern” permit based water rights	2	The legislation is fully implemented. Water resources are monitored mostly in quantity but quality. Inspection/enforcement action is undertaken but not very often.
De minimis/small scale rights	3	Provisions on minimum flows are provided in the legislation but almost is not implemented
Agency control	2	The volume of water to be abstracted for irrigation is not specified and monitored except urban and industry supply.
Water supply contracts	2	Almost annual contracts are provided for irrigation. Duration of other contracts for urban and industry water supply is 2 or 3 years.
Commonhold	2	The WUO is functional, thus the security of water tenure of WUO members will depend on the security of water tenure held by the WUO on the basis of either a water supply contract.
Reserves minimum flow	2	Legal regulations on reserves/minimum flow requirements are provided, but weakly implemented. However, water for basic human need as drinking water is given the highest priority to abstract. No conflict of water use is found.
Religious law	3	Provisions exist in formal law to recognize this type of water tenure. However, there is very little enforcement of formal law.
Informal	4	This kind of tenure arrangement is likely to provide no security of water tenure.
Assumed	4	This kind of tenure arrangement is likely to provide no security of water tenure.

Source: The author analyzed from the pilot study

3.7. Other key findings from the study

Other important findings from the study include: (i) ineffective implementation of integrated water resources management as a result of fragmented water governance, delays in implementing the water resources law in terms of both planning and the establishment of the necessary institutional arrangements including RBOs, the limited monitoring and measurement of water resources; (ii)

inadequate implementation of the requirements for water user permits as required by the water resources law; (iii) limited enforcement of relevant legislation on water resources management, water related protected areas and water infrastructure. Also, there are significant water quality and wastewater management challenges in terms of the quality of river water as well as the lack of wastewater treatment for urban areas and

the industrial sector and problems of diffuse source pollution from rural villages and agriculture in the pilot area. Furthermore, a weak and ambiguous relationship between MONRE, irrigation agencies and WUOs exists as a result of ambiguities relating to water use permitting and weak bulk water supply contracts. As required by the methodology, all of the key findings of the study have been presented to several national and regional meetings and seminars for comments and revision.

4. Conclusion and recommendations

Although Vietnam has a sound legal and policy framework for water resources management as most countries all over the world, the implementation of these existing framework remains shortcomings. This was confirmed in a water tenure assessment in a pilot area in Vietnam which is the Nui Coc irrigation system. The results of water tenure analysis shows that the main problem relating to water tenure in the assessment area is the ineffective enforcement of current regulations on water resource management and water uses due to various reasons. Firstly, the regulation itself has certain shortcomings, leading to problems or difficulties in actual implementation. Secondly, the capacity of the relevant management agencies and relevant stakeholders may also be limited. And, the effective of the legislation enforcement is likely influenced by the collaboration among relevant parties in the implementation. The overlap of responsibilities among relevant authorities could also make the implementation relatively slow. Analysis of the water tenure security also figures out the same limitations on implementation of current legislation on water tenure in Vietnam. Some types of water tenure possess very little to no security of water tenure. This proves the illegal water uses or misuse of water existing in the assessment areas and needs to be improved.

Based on the findings from this study, a number of recommendations are given. Firstly, it is necessary to review and revise the existing laws ensuring the clear accountability in water management at all levels. Also, building robust basin governance arrangements will be an essential backbone of integrated water resources management, which is a core component of the water resources law of Vietnam. As for improving the enforcement of legal regulations, it is advised that: (i) improving the quality of legal regulations via enhancing the capacity of policy-making institutions and democratizing the policy-making process with full participation of stakeholders; (ii) Providing sufficient fund for the enforcement of legal regulations. It should be essential for setting up sound criteria for fund allocation in policy enforcement and for the mobilization of fund from private sector to ensure the feasibility of policy implementation; (iii) strengthening the cooperation and relation in policy enforcement between high and low-level agencies and among all stakeholders; (iv) Enhancing the understanding about current regulations especially water conservation, water saving and efficient water use via public media, training programs, education course, seminar, meetings for stakeholders.

References

- 2030 WRG (Water Resources Group) (2017), *Vietnam: Hydro-Economic Framework for Assessing Water Sector Challenges*. Washington, DC: 2030 Water Resources Group.
- Bandaragoda, D. J. (2000), *A framework for institutional analysis for water resources management in a river basin context*. Working Paper 5. Colombo, Sri Lanka: International Water Management Institute.

- Blake, D., and L. Robins. (2016), “*Water Governance in a Changing Era: Perspectives on Vietnam A backdrop to water governance dynamics in the Mekong region.*” In *Water Governance Dynamics in the Mekong Region*, edited by David Blake and Lisa Robbins, 241–278. Petaling Jaya, Malaysia.
- Chinh Le Van (2020), *Policy and institutional arrangements to enhance water use efficiency in irrigated agriculture in Vietnam*, Journal of Water Resources and Environment Engineering, Vol. 72.2020.
- FAO (2020), *Water tenure assessment guide*, KwoWhat project, Food and Agriculture Organization of the United Nations, Rome.
- Hodgson Stephen (2016), *Exploring the concept of water tenure*, Food and Agriculture Organization of the United Nations, Rome.
- Hussain I., Turrall H., Molden D. & Din Ahmad U.M. (2007), *Measuring and Enhancing the Value of Agricultural Water in Irrigated River Basins*. Irrig. Sci. 25: 263-282.
- Loi Doan The (2014), *Policy and insitutional arrangements for improving the performance of irrigation systems* Journal of Water Resources Science and Technology, Vol.24 2014.
- MARD (2021), *Draft policy on water security and dam safety*, Ministry of Agriculture and Rural Development.
- Miguel, S. and F. G. Villarreal (1999), *The Dublin Principles for Water as Reflected in a Comparative Assessment of Institutional and Legal Arrangements for Integrated Water Resources Management*, Global Water Partnership/Swedish International, Sweden.
- MONRE, 2021. *Assessment of the implementation of the Law on Water Resources*. Ministry of Natural Resources and Environment.
- Murat Kilic and Suer Anac (2012), *Sustainable Management of Large Scale Irrigation Systems: A Decision Support Model for Gediz Basin*, Turkey, Ege University, Turkey
- Nam Le Duc, Hai Bui Tuan, Tu Dao Trong and Sokhem Pech (2013), *Institutional arrangements: policies and administrative mechanisms for water governance in the socialist republic of Vietnam*, Mekong project 4 on water governance, Challenge Program for Water and Food Mekong.
- Thai Nguyen IDMC (2021), *Annual report on opeation and maintenance of the Nui Coc system*.
- Tien L.T. Du, Duong D. Bui, Xuan T. Quach and Lisa Robbins (2016), “Water governance in a changing era: Perspectives on Vietnam”, In *Water goverance dynamics in the Mekion region* edited by David J.H. Blake and Lisa Robbins. ESER.
- Tuan Doan Doan and Thinh Nguyen Van (2015), *Measures for insitutional arrangements for water management in Gia Binh irrigation district*, Journal of Water Resources Science and Technology, Vol. 30. 2015.
- World Bank (2019), *Vietnam: Toward a Safe, Clean, and Resilient Water System*. World Bank, Washington, DC.