

# Chapter 16

## Negotiating Water Institutions in the Đồng-Nai River Basin, Vietnam: Unstable Balance Between Conservatism and Innovation



Huynh Thi Phuong Linh and Olivier Tessier

**Abstract** In a context of increasing struggles over access to water and environmental challenges, this chapter analyzes institutional efforts to support integrated water resources management in the framework of the Phước-Hòa Water Resources project (funded by Asian Development Bank [ADB] and Agence Française de Développement [AFD] in 2006–2018) that concurrently aimed to increase the Dầu-Tiếng Reservoir’s capacity and water infrastructure. The chapter investigates the institutional development process for management of the Dầu-Tiếng water resources system in a context of multiple uses and increasing environmental challenges to water quality and quantity, especially under the current obvious and severe effect of salinity intrusion. The chapter then sheds light on local dynamics surrounding the efforts to apply participatory irrigation management (PIM) and to increase agricultural productivity in Tân-Biên irrigated areas developed under the Phước-Hòa project. Through the case of the Phước-Hòa project, the chapter emphasizes the difficulty of defining the right unit for action in a context of shifting environmental and social conditions and the need to allow more flexibility and time in building water institutions. This chapter also seeks to contribute an empirical case study to the large and increasingly important literature on water governance in Southeast Asia and other developing areas. The chapter builds on the results of a multidisciplinary research project on local water governance in the Đồng-Nai basin. The research project’s results, while contributing to the pool of scientific knowledge, will help the AFD reflect on the factors driving and limiting the legacy of the development project.

**Keywords** Local water governance · Multiple-used water system · Institutional process · Agricultural development · Participatory Irrigation Management · Dong Nai river basin

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## 16.1 Introduction to the Complex and Multifunctional Đòng-Nai Basin

Đòng-Nai basin (Fig. 16.1), with a catchment of 36,481 km<sup>2</sup>, is the biggest basin entirely within the boundaries of Vietnam and among the three largest river basins in Vietnam. It contains the principal area of urban concentration and industrial development of the country, including the Hồ-Chí-Minh megacity, Lâm-Đông, Đắc-Nông, Bình-Phước, Bình-Dương, Tây-Ninh, Đòng-Nai, Bình-Thuận, Long-An, and Bà-Rịa-Vũng-Tàu. The basin population is about 19 million, constituting 21% of the national population, of which about 48% live in rural areas (data 2015, Nguyen Vu Huy 2016). The area accommodates a productive economy (constituting 48% of the national economy), which in turn places huge and complex demands on the water supply, including domestic water and water for industrial processes, for hydropower production, for irrigation, and for combating the intrusion of salinity. Because of its key social, economic, and political position in the country and the complex character of water governance, integrated water governance in the Đòng-Nai River basin becomes important and urgent.

The Đòng-Nai basin is made up by six smaller river basins: Vàm-Cỏ-Tây, Vàm-Cỏ-Đông, Sài-Gòn, Bé, Đòng-Nai, and La-Ngà (Fig. 16.1). The flow in the basin relies on a rainfall regime,<sup>1</sup> so it varies in space and time (Đỗ Đức Dũng et al. 2014). There are two seasons: the rainy season, from May/June to November, and the dry season. The rainy season correlates to the monsoon season (*mùa*) and provides most of the annual rainfall. The basin is closely linked to smaller rivers in the coastal area. The low-lying delta is strongly influenced by tides from the East Sea.<sup>2</sup> The basin has faced the influence of salinity, with a peak influence often falling in the last month of the dry season (April or May), when the outflow from the basin is lowest.

The basin possesses different elevations along its reach, from mountainous to delta to coastal areas. It is also characterized by a complex typology and geology, with diverse soil types, composed mainly of ferralsol/oxisol (about 3 million hectares, 51% natural area), acrisols (about 1.2 million hectares), and another 8 soil types. About 26% of the basin soil is unfavorable for farming: soil that is sandy or salty, thionic fluvisols or acid sulfate soil, and leptosols (gravelly or stony). The forestland in the region has decreased to 2 million hectares in 2014 (Đỗ Đức Dũng and Nguyễn Ngọc Anh 2015).

<sup>1</sup>Precipitation is 2000 mm on average and varies significantly across areas. While the estuarine area of Đòng-Nai River, the Vàm-Cỏ-Đông basin, and lower Đa Nhim have lower rainfall (1500–1700 mm annually), rainfall is 2500–3000 mm at the midstream of Đòng-Nai River, the upper Bé River, and the upper and midstream La-Ngà River.

<sup>2</sup>Due to the large amplitudes of the tide (up to 3.5–4.0 m along the coast) and the low riverbed slopes, the tide enters deeply into rivers and canals. The tide effect can reach up to the foot of the Trị An waterfall of Đòng-Nai River, 132.8 km from the sea; to the Dầu-Tiếng dam site on the Sài-Gòn River, 184.4 km from the sea; and to the Cambodia border on the Vàm-Cỏ-Đông River, 208 km from the sea (Corderi 2011).



**Fig. 16.1** The location of the sub-basins in the Đồng-Nai River basin and the adjacent coastal basins. (Source: Southern Institute for Water Resources Planning 2016)

Water development in the Đồng-Nai basin in the last four decades has been dominated by infrastructure investments, especially those devoted to the development of hydropower. Because of the favorable condition for cascades, the basin has been subjected to exploitation to produce energy for a long time, beginning with the first Đon Dương/Đa Nhim project in the 1960s funded by the Japanese. By 2015, the basin already hosted 12 hydropower projects<sup>3</sup> (Fig. 16.2, Table 16.1). Many of the projects recently are under heated debate for their huge impact on the environment. For instance, projects ĐN6 and ĐN6A have been stopped because of the risk they posed to the Cát-Tiên National Forest. The Đồng-Nai 8 project has been replaced by five small projects (planned): Tà Lài, Phú Tân 1 and 2, Thanh-Son, and Ngọc-Định. Artificial reservoirs are also common in the small rivers and streams, such as Da-Tôn, suối Mây, suối Cà, Gia-Ui, and Cầu-Mới.

The seemingly endless endeavor to control nature has shaped the waterscape of the region. Since the establishment of the Dầu-Tiếng hydraulic system in the late 1980s, water has been stored in Dầu-Tiếng Reservoir in the upper Sài-Gòn River and redistributed for the basin's multiple uses. Since the development of Dầu-Tiếng, "reservoir water" has become a notion in everyday life in Tây-Ninh to distinguish it from river water or groundwater. Also, since then, the government of Vietnam and its development partners have striven to improve the capacity and management of

<sup>3</sup> Three hydropower projects are on Bé River, 7 on Đồng-Nai River, including the biggest reservoir Trị An—14,890 km<sup>2</sup> with 2.76 billion m<sup>3</sup>; and two on La-Ngà River.



**Table 16.1** Hydropower projects in Đồng-Nai basin and their parameters

River/tributary	Year in operation	Type	Capacity hydropower (MW)	Regular water level (m)	Dead water level (m)	Maximum flooding water level (m)	Designed flooding water level (m)	Full capacity (million m <sup>3</sup> )	Usable volume (million m <sup>3</sup> )
<b>Bé</b>									
Thác Mơ	1994	Hydropower	75	218	198	220.8		1360.00	1250.00
Cần Đơn	2003	Hydropower	77.6	110	104	112.36	111.44	165.50	79.90
Srok-Phu-Miêng	2006	Hydropower	51	72	70	73.6	72.75	99.30	28.57
Phước-Hòa	2012	Other (power)		42.9	42.5	48.25	46.23	13.72	2.45
<b>Đồng-Nai</b>									
Đôn Dương/Đa Nhim	1964	Hydropower	160	1042	1018	1043.2		165.00	155.14
Đại Ninh	2008	Hydropower, other	300	880	860	882.6		319.77	251.73
Đồng-Nai 2	2015	Hydropower	70	680	665	681.61		281.00	143.40
Đồng-Nai 3	2011	Hydropower	180	590	570	593.24		1690.10	891.50
Đồng-Nai 4	2012	Hydropower	340	476	474	479.24		332.10	16.40
Đồng-Nai 5	2015	Hydropower	150	288	286			106.33	8.35
<b>Là-Ngã</b>									
Hàm Thuận	2001	Hydropower	300	605	575	607.5	606.7	695.00	523.00
Đa Mi	2001	Hydropower	175	325	323	327.4	327.05	140.80	11.60
Trị An	1991	Hydropower, other	400	62	50	63.9		2764.70	2546.70
<b>Sài-Gòn</b>									
Dầu-Tiêng	1985	Hydropower, other	...	24.4	17	26.92	25.1	1580	1110

Sources: Van Duc and Gupta (2010), Gov. Decision of Prime Minister 471/QĐ-TTg on issuing the inter-reservoir operation procedure on Đồng-Nai River basin. *Projects under construction* (downstream Hàm Thuận-Đa Mi): Là-Ngã 3 reservoir for water supply; Tà Pao dam for water regulation for irrigation and other purposes. *Disputed projects* (in Đồng-Nai river between ĐN 5 and Trị An): ĐN6 and ĐN6A due to the risk posed to Cát Tiên National Forest. *Planned projects*: five small hydropower dams: Tà Lài, Phú Tân 1, Phú Tân 2, Thanh Sơn, Ngọc Định (replacing the one big Đồng-Nai 8)

Therefore, in this basin, optimizing water use for hydropower as well as other purposes, such as irrigation, domestic and industrial uses, and environmental flows, is a challenge.

### ***16.1.1 The Basin's Agriculture Landscape***

The basin has undergone substantial rural and agricultural transformation in recent decades. The data confirms that 950,000 ha are devoted to agriculture, and two-thirds of this produces three seasonal crops (data 2011, Nguyen Vu Huy 2016). Areas like Tây-Ninh have witnessed different periods of agricultural landscape, with sugarcane in the 1990s under the support of a sugar factory, and cassava in the last 10 years because of the tapioca market and processing facilities, and the recent boom of rubber plantations since the late 2000s. The transformation of the agricultural landscape is more often than not driven by market forces and dynamics of the farming society (a focus on crops demanded by booming markets). The agricultural landscape has also been transformed by the loss of farming land to urban and industrial expansion.

Natural conditions such as climate, soil type, and the physical condition of water infrastructure continue playing their parts. The climate or the rain indeed has had a close relationship to the choice of farming systems; for instance, when irrigation infrastructure was not in place (canal or pump), farmers in Tây-Ninh planted only for the rainy season (*vụ mùa*). Such dependency of the farming system on reliable patterns of climate continues today, with two or three seasons a year and with a more diverse cropping patterns other than the dominant rice crop. However, it is recently challenged by the unpredictability of irregular rain and drought. For instance, an unusual dry season in 2016 followed by a prolonged rainy season during the winter-spring season of 2016–2017 (heavy rains continued until December 2016) confused farmers in whether to start the cassava crops, which need at least 7 months of growth before the next rainy season.<sup>4</sup>

The agricultural landscape of the basin continuously changes and is shaped by the natural conditions of climate, land and water, the irrigation infrastructure, the level of urban and industrial expansion, and last but not least the market, together with the interference of private companies. All factors affect the landscape simultaneously. One challenge might create the ground for another alternative. For example, the delay of planned designed cassava cultivation due to the prolonged rain in 2016 motivated many farmers to switch to sugarcane, with financial and technical support from the sugar company, Thanh Thành Công. Other farmers opted for rice cultivation during the dry winter/spring, counting on the potential of a newly constructed canal system. Therefore, the intertwined influence of the different factors

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<sup>4</sup>Main casava season runs from October to June or July for lowland (*mỹ ruộng*) that is combined with one rice crop during the rainy season; or from October to October in higher land (*mỹ rẫy*).

makes farming systems and activities more complex and unpredictable. It is difficult if not impossible to point out models for water governance and the management of agriculture landscapes in this basin.

## 16.2 Negotiating Water Institutions in Dầu-Tiếng Water System

Dầu-Tiếng is Vietnam's largest water reservoir and mainly serves the purposes of irrigation and domestic-industrial usages (*hồ thủy lợi*), distinguished from those for hydropower purposes. The reservoir stores water in the rainy season to supply in the dry season. It has a catchment of 27 km<sup>2</sup>, a maximum water level at 26.92 m, a dead level at 17 m, and a volume of about 1.6 billion m<sup>3</sup>. The development of the Dầu-Tiếng irrigation project (1981–1985) was supported by a loan from the World Bank through the International Development Association (\$60 million) and with the funding from the Kuwait Fund (OPEC) and the Netherlands government (\$10 million each) (World Bank 1978). The project, designed by the Ministry of Water Conservancy of Vietnam and constructed by the state-owned Hydraulic Works Company 9, was part of the national program to rehabilitate existing hydraulic works and small irrigation schemes (supported by the World Food Program and non-governmental organizations, including Church World Service of the United States) (*ibid.*). The project, in continuity with the commitment of the former Republic of South Vietnam, was a significant expression of extensive international support for Vietnam's nation-building plan after reunification.<sup>5</sup> The project's specific objectives were to increase cropping intensity and production, to make Vietnam self-sufficient for food (World Bank 1989). After the appraisal in January 1978, the project objective was narrowed from 172,000 ha of irrigated land to gravity-irrigating 42,000 ha in five districts in the southern part of Tây-Ninh Province and about 14,000 ha by pumping irrigation for Cu Chi District of Ho Chi Minh City. The other potential 30,000 ha of irrigated land in Tây-Ninh was planned. The project included an earth dam and its accessories on the Sài-Gòn River and an irrigation system starting from West and East Canals, including an adequate drainage network and inspection and access roads. Part of the project objective was also to relieve the severe unemployment problem in the south (*ibid.*).

Since the 1980s, the irrigation system in Tây-Ninh has been maintained and improved with national and provincial programs or donor projects such as Vietnam Water Resources Assistance Project (VWRAP; 2004–2012).<sup>6</sup> Today, the Dầu-Tiếng system supplies water for irrigation in Tây-Ninh, Hồ-Chí-Minh City, Bình-Dương,

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<sup>5</sup> Other International Development Association projects in Vietnam involved coal mining, power, and railway workshop projects and industrial rehabilitation projects.

<sup>6</sup> VWRAP is funded by the World Bank to modernize and increase the productivity of Vietnamese agriculture, improve the management of water resources, and reduce dam safety risks. Tây-Ninh area was within the scope of capacity building in the PIM application for the project.

and Long-An; domestic use in Hồ-Chí-Minh City; salinity flushing for Hồ-Chí-Minh City and Long-An; and for environmental flow.

The Dầu-Tiếng system, since its completion in 1985, is managed by a bureaucratic system of Dầu-Tiếng companies (called Dầu-Tiếng-Phước-Hòa Irrigation Engineering Integrated Complex since 2006) in cooperation with provincial irrigation management companies (IMCs) and their line offices at the district level. Despite the effort to develop consistent practices, the Dầu-Tiếng system is continually challenged by practices and negotiations, by various actors who differ not only in terms of interest, scale and power but also because of varying ecological and agricultural changes. As the main actor in operation and maintenance (O&M),<sup>7</sup> the Dầu-Tiếng Company has worked at the interface of bureaucratic state structure and business practices to allocate water and mitigate the risks of structural damage from floods, drought, and the more recent salinity intrusions. The Dầu-Tiếng company is under direct supervision of the government and thus reports to the Ministry of Agriculture and Rural Development (MARD).

To manage and operate the Dầu-Tiếng Reservoir to meet several targets for downstream safety and reservoir safety, a committee (*hội đồng hệ thống*) was established. The Management Committee for the Exploitation of the Dầu-Tiếng Water System makes planning decisions for system O&M and for cooperation between agencies at Dầu-Tiếng and at the province level.<sup>8</sup> This committee is led by MARD and includes the representatives of provinces that either use or are affected by the water of the reservoir (the chairman or vice chairman of the provincial People Committee<sup>9</sup>). The Dầu-Tiếng company represents the standing member of the committee, in charge of managing databases, advising the chairs, and executing rescue activities in disaster situations.

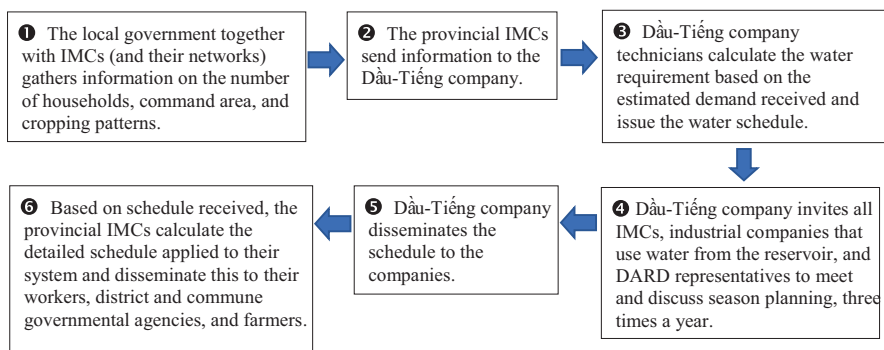
The Dầu-Tiếng water system is operated by a form of contract between Dầu-Tiếng company and the provincial Irrigation Management Company (IMC), and between the IMC (and its offices) and local irrigation units, in form of either cooperatives (*hợp tác xã*) or irrigation groups (*Tổ-Thủy-Nông/Tổ hợp tác*). There are three identical steps in the operation of the system at the Dầu-Tiếng company level and the local level (Fig. 16.3).

<sup>7</sup> Operation and maintenance (O&M) is a term introduced officially by the Food and Agriculture Organization of the United Nations (Snellen 1997). “Operation” is defined as the task to operate the system to supply irrigation water, and “maintenance” involves efforts to keep the scheme in good working order. O&M and financial control comprise the three main tasks to keep a system running.

<sup>8</sup> According to decision 298NN-TCCB/QĐ of the minister of MARD on 8 April 1996 on the members and duties of the management committee for the exploitation of the Dầu-Tiếng water system. The committee is currently renamed the Management Committee for the Exploitation of the Dầu-Tiếng-Phước-Hòa Water System

<sup>9</sup> The Peoples Committee is the governmental umbrella office at the provincial level where the top leaders sit and make decision regarding social-economic issues of the province. The Peoples Committee is advised by the line offices of the ministry, for instance, the Department of Agriculture and Rural Development (DARD) under MARD. The department holds a dual-subordination position by reporting to both provincial Peoples Committee and MARD at the central level. The same structure applies to the district and commune level.





**Fig. 16.3** Irrigation operation steps between Dầu-Tiếng company and the provincial irrigation management companies (IMCs), and between the IMCs (and their offices) and local irrigation units

The economic contract between companies expresses a business form of operation, in which Dầu-Tiếng company is the service provider and IMCs and/or provincial authorities are the customers, and in turn the provincial IMCs are the service provider supplying water for the local authorities as their customers (the commune’s People Committee represents the farmers in signing the irrigation contract with the water company). However, due to the close relationship between companies and governmental agencies at the same level, the operation of the system in practice manifests a hierarchical structure that is common in Vietnamese governmental practice. A hierarchical structure also appears in how MARD can direct the Dầu-Tiếng company. Such interference of the power of the state structure, on the one hand, can support cooperation between companies (water supply and hydropower); on the other hand, the market mechanism that decides the responsibility and accountability of the service providers is diminished. This is especially true for the case of irrigation, given the exemption of irrigation service fees (ISF) since 2008. Nguyễn Trung Dũng (2016) described the ISF policy in Vietnam as a shift from the rather stable market mechanism for 25 years (1962–2003), where farmers used the service and paid when they were satisfied with the service, to the period when the user payments are partly exempted and the state partly provides ISF (2003–2007—Decree 143), to the stage where the state pays to IMCs the cost of service provided to the farmers (Decree 154/2007 and Decree 115/2008), which Nguyễn calls “the third party paying the service”.<sup>10</sup>

<sup>10</sup>“Third party paying the service” means “the company provides water service, the farmers use water for irrigation, the government pays” Nguyễn Trung Dũng (2016). Since the Decree 115, farmers stopped paying any fee related to irrigation, and the IMC and its line agencies have been operated and managed with a state budget for ISF compensation (*cấp bù thủy lợi phí*). ISF exemption has resulted in various and contradictory financial impacts to the irrigation system. The policy aimed to reduce financial burdens for poor farming households and stabilize the operation of the water company. According to provincial leaders, those benefits imply better living conditions for both farmers and the staff at local irrigation management organizations, and consequently results

### ***16.2.1 Phước-Hòa Project: The Solution and the Attached Challenge***

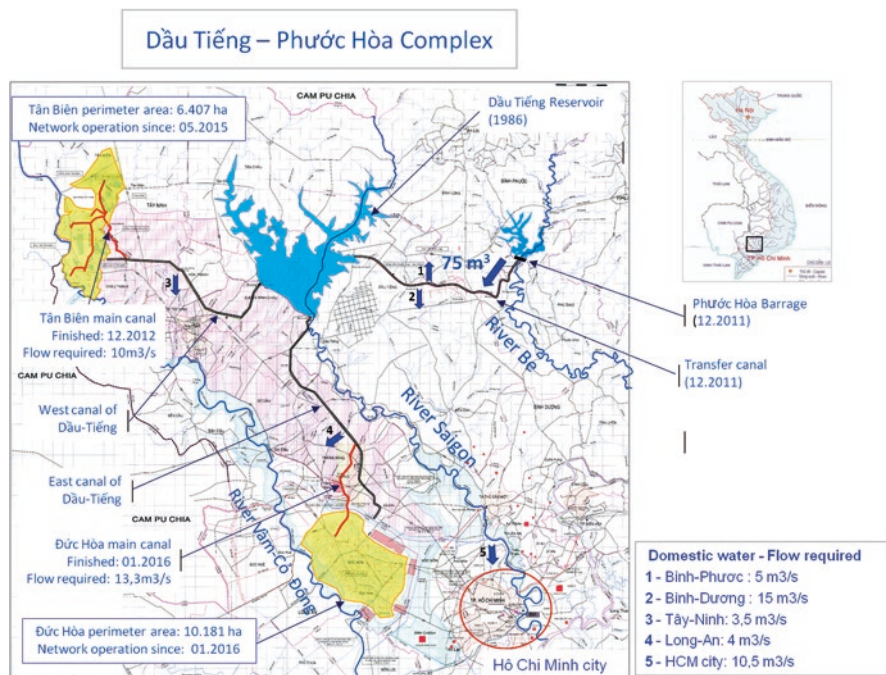
In recent years, demand for water has dramatically increased along with seasonal water shortages and the progressive salinization of the Vàm-Cỏ-Đông and Sài-Gòn Rivers. Thus, from 2006, in realizing a previous plan for water diversion from the Bé River to the Dầu-Tiếng Reservoir, the Phước-Hòa project (2006–2018, Fig. 16.4) has been implemented by MARD with loans and funds from the Asian Development Bank (ADB) and the Agence Française de Développement (AFD). The project aims to “develop the water resources of the Bé River and transfer it to Sài-Gòn and Vàm-Cỏ-Đông rivers for irrigation to increase agricultural production, provide water for Hồ-Chí-Minh city, and control saline intrusion thereby providing social, economic and environmental benefits”(ADB factsheet). The project consists of two parts: support for institutional and integrated development, and construction of water resources infrastructure. The project’s irrigation target aims to supply more water for irrigation through the transfer canal from Phước-Hòa barrage to Dầu-Tiếng Reservoir (for the two communes with lands adjacent to the canal), to supply more water for the West Canal system (to Tân-Biên perimeter in Tây Ninh province), and the East Canal system (to Cù-Chi of Hồ-Chí-Minh City, and Đức-Hòa of Long-An province). Project organization is described as follows:

The project executing agency (EA) is MARD. Project implementation is the responsibility of the Hydraulic Project Investment and Construction Management Board No. 9 (ICMB9), and Departments of Agriculture and Rural Development (DARDs) of the four project provinces. ICMB9 provides an interface with the ADB and AFD, and is directly responsible for management and construction of the Phước-Hòa Barrage, Phước-Hòa-Dầu-Tiếng transfer canal, and main canals for the irrigation systems. DARDs and their Provincial Project Management Boards (PPMBs) have responsibility for implementation management of design and construction of the downstream canal systems, development of irrigation areas and implementation of OSDPs [on-farm and social development programs]. The role of ICMB9 is to provide overall management assistance and coordination, and to provide instruction to the DARDs and PPMBs with assistance from project implementation consultants, Black & Veatch International in the first phase and SCP-HEC II [Vietnamese Consulting Joint Stock Hydraulic Engineering Company 2] in the second phase (started in April 2016) (AFD Factsheet).

The designed irrigated areas of Phước-Hòa project had been adjusted downward from more than 48,000 ha in 2003 to almost 30,000 ha in 2008 for three perimeters (Bình-Long of Bình-Dương, Đức-Hòa of Long-An, and Tân-Biên of Tây-Ninh) and a small part of Thái-Mỹ of Cù-Chi District (Hồ-Chí-Minh City) and to about 17,500 ha in 2014. Adjustments had been made for the expansion of industrial land

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in better efficiency in irrigation services (Report on Implementation assessment of Decree 115 and Circular 65, CPIM-AFD 2012). However, the exemption lowers the sense of accountability not only for farmers and other service users but possibly also in the IMCs and the service providers. When IMCs are financially secured by the state’s ISF compensation, IMC staff no longer rely on the fee paid by the farmers, and farmers are using water for free (Dang Minh Tuyen 2010:05). That induces a risk of low accountability from the IMCs in providing service and farmers in using water.



**Fig. 16.4** Phước-Hòa water project. (Source: Asian Development Bank and Agence Française de Développement)

in Bình-Dương during the 2000s (canceling the Fourth Bình-Long perimeter), and for the strong shift of cropping pattern toward cash crops (rubber in Tây-Ninh); part of the adjustment was also because of redefinition of infrastructure capacity during designing, consulting with local stakeholders, and construction periods. Up to today, data of the real irrigated areas are only estimated and the real potential of each perimeter is not (able to be) measured.

The millions-USD Phước-Hòa project marks a continuity in the efforts to maximize the usage of natural resources for development, for the demands of a tremendous increase of population in the region, and for coping with unpredictable climate conditions.

Since the implementation of the Phước-Hòa project, the task of operating the Dầu-Tiếng Reservoir is getting more difficult, according to Dầu-Tiếng company's personnel in charge (interview date 06.6.2017). First, having more water from the Phước-Hòa Barrage means including more irrigated areas in the management scheme of the Dầu-Tiếng company (designed at 16,500 ha). During the dry season, the chance to get extra water for Dầu-Tiếng is uncertain because the hydrometeorology features of the whole Đồng-Nai basin are affected in the same way by the seasonal flow; when Dầu-Tiếng is short of water, so is Phước-Hòa Reservoir. Thus how to manage the water system in order to maintain a targeted water level is difficult to calculate. Water availability for the Phước-Hòa Barrage relies on the opera-

tion of three upstream hydropower reservoirs, Thác Mơ, Cần Đơn, and Srok Phu Miêng, each of which often has purposes other than irrigation and domestic and industrial water supply. The director of the Dầu-Tiếng company confirms the importance of inter-reservoir operation as regulated by various legal documents defining an inter-reservoir operation procedure.<sup>11</sup> However, contrasting benefits can prevent the procedure from working. In the dry season, for example, hydropower operators want to store water for power production. Also, the different lines of management, with the Ministry of Industry and Commerce managing hydropower while MARD manages the Dầu-Tiếng Company, poses the risk of conflicting interests to inter-reservoir operation and cooperation. In case of crisis, both types of reservoir suffer from a lack of water or too much water,<sup>12</sup> and although a cooperative mechanism is applied, it is not yet effective. Often, Dầu-Tiếng company is at a disadvantage because it is located downstream, with less leverage compared to the upstream power companies.

The Dầu-Tiếng company prepared an operation procedure for the Dầu-Tiếng Reservoir in the new context, which was sent to MARD for approval in 2016. Also, in March 2016 the prime minister issued the decision 471/QĐ-TTg, which defined the procedures for inter-reservoir operation in the Đồng-Nai basin. The challenges of system management and the risks deriving from uncertain climate and increasing demand have profoundly tested this water management system. Institutionally, the lack of effective coordination between actors with contrasting interests and the lack of technologies and/or mechanisms for inter-reservoir operation have made the optimization of water usage in the basin even more difficult.

### 16.3 Bargaining Institutions at Local Level: The Case of PIM in Phước-Hòa Project

The Phước-Hòa project is now in its final year (2018). The project's phase 1 (2006–2012) managed to build the infrastructure for the basin transfer component (Phước-Hòa Barrage and transfer canal, handed over December 2011) and the construction of Tân-Biên main canal based on the upgrade of the TN10 canal of the system provided by the West Canal of Dầu-Tiếng system. It also implemented the related institutional program called On-farm and Social Development Program I (OSDP I). The second phase of the project (2012–2018) continues the institutional development of OSDP at the same time as the construction of Đức-Hòa main canal and the design and construction of primary, secondary, and tertiary canals (PST) in both irrigated command areas. Institutional efforts to support integrated water resources

<sup>11</sup> Decision 471/QĐ-TTg dated 24 March 2016 on issuing the procedure for inter-reservoir operation in Đồng-Nai basin.

<sup>12</sup> While not addressed directly in this chapter, the issue of abundance of water is also a prominent concern in the basin. The risk of structure failure and downstream inundation are the two main challenges concerning managers in operating the reservoirs.

management in the framework of the Phước-Hòa Water Resources project is carried out in the OSDP. The program consists of two activities: a social support program for the people affected by the project, and an on-farm development program, which aims to support beneficiaries of the project by participatory PST design, the establishment of a management model for the on-farm system, and the agriculture support program. Beneficiaries are defined as the farmers who will receive irrigation water for their fields and thus supposedly gain benefit from the project.

OSDP packages were also made to two phases and carried out by a group of national OSDP expert consultants. The consulting contract structure between OSDP consultants and the PPMB helps the decision makers manage the project according to a timeline. The presumption is that the combined activities will result in the project's objective of infrastructure effectiveness and a good foundation for PIM development in the area.

### ***16.3.1 The Manifestation of PIM in Tân-Biên Irrigated Area of Phước-Hòa Project***

#### **16.3.1.1 PIM in Development Project: An International Norm**

Since the 1980s, irrigation modernization refers to the idea of managing irrigation and drainage<sup>13</sup> in a way that is both financially feasible and sustainably efficient. Among other conventional technocratic measures, irrigation management transfer has become a tendency since its first introduction in Mexico in the 1980s and then in the Philippines in the 1990s. The transfer broadly means to “reduce public expenditure whilst increasing farmer participation in the management of the irrigation systems” (Burton et al. 2002:7). The new form of water management attaches or somewhat covers the formation of water user associations/organizations (WUAs/WUOs). The focus on farmers' participation in irrigation management (PIM) was discussed at the same time as WUAs and irrigation management transfer, and WUAs are considered to be a subset of PIM (Van Vuren et al. 2004). The World Bank (1996, cited by Van Vuren et al. 2004) defines PIM as “the involvement of irrigation users in all aspects and all levels of irrigation management”, in which “involvement” is flexible, ranging from light involvement like information sharing, consultation, joined assessment of problems to real involvement like decision making, collaboration, and full say by the water users; “all aspects” include initial planning and design of new irrigation projects or improvements, as well as the construction, supervision, financing, decision rules, operation, maintenance, monitoring, and evaluation of the system; “all levels” means tertiary, secondary, and main system levels, as well as project and sector levels.

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<sup>13</sup>The term “drainage” is often missing in the whole discussion about water for agriculture. However, it is often understood to be included, as drainage is an essential component of an irrigation system.

Since the 1990s, Vietnam, like many other countries, has adopted the idea of irrigation modernization using these approaches or terminologies: PIM in combination with WUOs or WUAs, and irrigation management transfer. The country indeed adopted different ideas and models from the Food and Agriculture Organization of the United Nations and other global tools in the investment for the software component of the irrigation systems (Nguyen Xuan Tiep 2008:40). Among the components of modern irrigation management, PIM is especially favored by the state agencies and projects funded by international organizations such as the ADB and the AFD<sup>14</sup> and the non-governmental organizations. PIM is translated in Vietnam in the broad sense: irrigation management with farmers involved, who participate in planning, designing, investing, and constructing and managing hydraulic works (Nguyen Xuan Tiep 2008a:26). In terms of legal recognition, PIM and water user group (WUG) could be related to

- The ordinance on exploitation and protection of hydraulic works;
- The “Framework for PIM Development in Vietnam” no. 3212/BNN-TL (its draft was already discussed since 1997 under the guidance and financial support from donors); and
- Circular no. 75/2004/TT-BNN on “Guidance for establishment, consolidation and development of WUOs.”<sup>15</sup>

In fact, the two latter documents were issued by MARD after the regional workshop Participatory Irrigation Management Pathway in Progress in Viet Nam in 2004. The workshop was financed by ADB, Denmark’s development cooperation (DANIDA), the International PIM Organization, and the World Bank. Also in 2004, the country’s development of PIM reached a milestone with the establishment of the Center for Participatory Irrigation Management (CPIM) under the Vietnam Academy for Water Resources (VAWR)—both CPIM and VAWR are the OSDP consultants of Phước-Hòa project, with separate teams for two irrigated areas.

In addition, the Vietnamese PIM expert Nguyễn Xuân Tiệp (2008a) has argued that PIM has already existed within the social dynamic in northern Vietnam in the past. It was manifested in the participation of local people in constructing and managing small-scale irrigation systems in the north. That form of collective organization (either voluntary or not) only existed in the construction of small irrigation or drainage canals at the village level. Besides, the major works for the containment of the Red and the Thai Binh river basin, which took place during the eleventh century,

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<sup>14</sup>In an assessment of PIM and related projects in Vietnam, Nguyen Xuan Tiep (2008:81) stated that PIM has mostly been established as a requirement in certain projects, and each project has a different approach to implement PIM. Therefore, those projects are “biased to achievements” and are hardly effective. Many PIM models return to starting points after the completion of projects regardless of the projects’ scale and fund sources (ibid:81).

<sup>15</sup>WUAs/WUOs in Vietnam are very diverse in forms and names. There are several of each kind ranging from cooperatives and associations/groups to village organizations (for more detail, see Nguyen Xuan Tiep 2008:81–82). Except the cooperatives, which have been organized according to cooperative law – 18/2003/QH11, the associations or groups have no standard formulation and operation.

resulted from the massive mobilization of military troops and the obligation of the inhabitants to contribute labor (public duty) (Tessier 2011).

There also existed the culture of mutual help in building houses, ploughing, and transplanting, which were organized in associations (Phường, Hội, and Yêng) (Nguyen Xuan Tiep 2008c). In particular, the traditional organization for labor exchange, based on the principle of voluntary service, was applied during the collectivization period (1960s–1981). Preceding the complete form of forced integration of all peasant households into agricultural production cooperatives, which was finalized in the 1960s, northern rural households had engaged in the “labor-exchange group based on work point” (*tổ đổi công bình công chấm điểm*). Under the mutual help model, groups (*tập-đoàn*) specializing in water management were established. Those groups provided labor for the works related to irrigation, drainage, and particularly construction of hydraulic infrastructures. Such collective units were not founded on a voluntary basis; rather, they consisted of compulsory membership, which was demanded and controlled by the cooperatives (Fontenelle and Tessier 1997). Because of its non-voluntary nature that strongly affiliated with the collectivization policy, the groups gradually dissolved after the country’s reform toward a market economy—*Đổi-mới* or renovation—in the late 1980s.

However, the spirit of the traditionally institutionalized norm of mutual help survived, yet to a lesser extent of organization compared to the collectivization period. Since de-collectivization in the 1980s, the participation of people has been promoted through the “the State and the population working together” policy (*Nhà nước và nhân dân cùng làm*) and the grassroots democracy policy: “people know, people discuss, people do, and people inspect.”<sup>16</sup> Today, although there is no structured system or regulation for labor contributions, there still exists a system of contribution and cooperation at the local level to guide the contribution of people for public works, including the construction and maintenance of the hydraulic infrastructure. However, the extent of organization for social contribution to public matters varies; more often than not, it is far different in extent and form from the expectation of the policy makers.

In the region where the Phước-Hòa project is located and in the Tây-Ninh Province in particular, the situation is very different. In fact, the Tân-Biên irrigated area of the Phước-Hòa project was part of the “new economic zones.” Since the reunification of Vietnam in the 1970s, expanding the agricultural area, mainly for growing rice and peanuts, happened alongside the large-scale settlement program in the rural areas—the so-called new economic zones—where the unemployed from urban centers of the south and people from overpopulated northern provinces were accommodated. Because of the recent arrival of migrants of various origins, these did not possess a tradition of mutual help practices (e.g. social assistance, work exchange, or any other non-market forms of exchange). So, the setting up of collective organizations of water management structured around WUAs and WUGs represents a more complicated challenge due to the lack of a pre-existing social

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<sup>16</sup> Ordinance on grassroots democracy—practicing democracy at commune, ward, and town 34/2007/PL-UBTVQH11, replacing Grassroots Democracy Decree 79/2003/NĐ-CP.

foundation. It implies the requirement for a different approach rather than a standardized or blue-print model.

By and large, the Vietnam case of irrigation modernization and PIM illustrates both the influence of international development agendas and their own traditions of national dynamics in irrigation management—the latter strongly influenced by regional diversity.

### 16.3.1.2 Participatory Approach in Phước-Hòa Project Through the OSDP

In the Phước-Hòa project, the application of PIM is characterized by

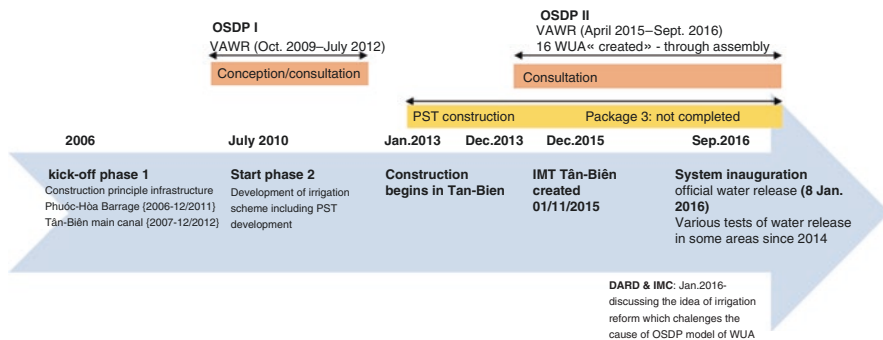
1. Enhancing irrigation efficiency, to transfer some infrastructure management to farmers and mobilize the accountability of the water users;
2. Focusing solely on water users; and
3. Water user organizations (WUOs) as a definite aspect of PIM.

The OSDP is designed as a form of consultancy in which the consulting firm provides service according to a contract with identical assignments. In Tân-Biên, phase I ran from October 2009 to July 2012, and phase II started in April 2015 and finished in September 2016, with an interval between the two phases during the PST construction period. The OSDP is guided by the PIM and WUG guidelines (2004) that were prepared by Black & Veatch International, the project consultants during phase I, and were based on the basic knowledge of the project's area:

WUG is established on with relevant scope and organizational structure in line with features of facilities, level of management capacity, traditions, practices and demands of farmers. ... The WUG shall have a management board consisting of a Chairman and Deputies. The Chairman is elected by the WUG's congress on the principle "one family, one vote" and is legally recognized by the responsible authorities. The number of Deputies will be determined in the congress. The Deputies will be introduced by the Chairman and voted by the congress. (PIM guideline 2004)

The contract in this case was signed between the VAWR as the consulting firm and the Tây-Ninh Province PPMB. The contract regulates quantitatively the activities to be done within a timeline. In the case of the Tân-Biên irrigated areas, the main activity of the on-farm development package of OSDP I was to consult with the farmers or beneficiaries regarding the design of primary, secondary, and tertiary canals (PST), especially about the direction and design of tertiary canals. In this process, the PST design was created by the consulting firm. OSDP consultants presented the design to the farmers, mainly through representative farmers in the community-based monitoring group (*Tổ giám sát cộng đồng*). OSDP II comprised training in WUG and PIM, establishment of WUAs, and information dissemination, as well as public meetings on constructing the on-farm canals, which is the responsibility of farmers. The construction of the PST system took place between OSDP I and II; thus, there was no intermediate agent for the continuous consultation for PST systems during construction period (Fig. 16.5). The feedback mechanism went





**Fig. 16.5** Phước-Hòa project timeline in Tân-Biên irrigated area, focusing on the On-Farm and Social Development Program. (Source: Tessier et al. 2016)

back to the existing hierarchical structure of the state—from hamlet to commune, to district, to provincial level, and then to the PPMB of the project.

All informants interviewed during the OSDP II expressed that it was not easy to understand the information and the PST design discussed during the public meeting. Despite some field surveys where farmers joined the engineer in checking the direction of the tertiary canals, how local opinions were introduced into management practices was unclear, and the PST parameters (length, depth, width) were all unclear until the construction was carried out. The meeting did not provide farmers with an explanation of the nature of the system design, in which the principle of water energy and elevation played a big role.<sup>17</sup> This later resulted in complaints from farmers about all localized issues such as low-lying canals or different locations of the canal. In general, in OSDP I, the application of PIM in the PST designing process remained mainly at the level of information dissemination rather than participatory design. For both local cadres and “ordinary” farmers, the project worked through a predesigned model and training was far from sufficient for building capacity for a new irrigation management method (regime).

### 16.3.1.3 Water User Only Principle

In OSDP I, future water users remained passive spectators of the program’s activities, including the consultation of PST design. In addition, although to a lesser extent compared to the other perimeter at Đức-Hòa, the local cadres such as commune state officers in Tân-Biên were excluded from the same activity. The application of such a rule derives from the principle of users only. The local cadres were not

<sup>17</sup>Because water runs from higher to lower, in designing an irrigation system the non-uniform elevations may create a situation where one field does not get water from the adjacent lower canal; rather, water will be delivered from a more distant canal farther upstream. Such technical logic is often neglected in conversations with the end users—the farmers.

candidates for community-based monitoring groups that oversaw the construction of PST. The user principle of PIM specifies that the project be managed by the users, for the users (WB 1996, cited in Van Vuren et al. 2004). In the project, the consultants squarely laid the focus on ordinary farmers under the assumption that other stakeholders at the local levels such as commune and hamlet cadres were already involved as managers and decision makers. Part of the challenge also results from the attempt to create a form of farmer organization that is autonomous from the state bureaucratic system. All of these are the indicators of PIM applicable for Nepal, the Philippines, and Mexico in achieving effective management and stronger accountability by the water users and at a lower cost for the state. However, the application of the same indicators has not created similar effects in the case of the Tân-Biên irrigated area.

Applying a no-state practice in the PIM mechanism in Vietnam introduces the risk of neglecting other main actors who play significant roles in shaping and deciding the success of PIM and the effectiveness of the system. Local cadres such as commune and hamlet cadres who are at the final position in the chain of governance in Vietnam's hierarchical state system have been the long arm of the state in implementing policies and in social mobilization. In this system, macropolicies and divisions of tasks defined in legislation create and allow a framework for enforcement and implementation at the lower levels. At the blurred interface between society and the local state, when much of the latter are also farmers, excluding the local state has excluded one or many prestigious people and those with authority. As part of the "new economic zone" where society was formed within the state structure of management, people in the Tân-Biên irrigated area have developed a sense of overlap between state and social leaders. In other words, those with authority in the area also possess social prestige; thus they might be more able to gather people for PST design viewing, PIM and WUA discussions and training, and at the later stage for on-farm canal discussions.

Over the course of OSDP, commune cadres and hamlet cadres were asked to support OSDP consultants in solving problems/conflicts and gathering people for training, and some hamlet cadres became the leaders of the WUAs established by the project. The Phước-Hòa project again falls into an ambivalent position in the ongoing debate over the autonomy of local irrigation management from the state system, and whether making use of the local system is possible in the way that can also bring benefits. On the one hand, the inclusion of local cadres potentially transfers the existing bureaucratic system of top-down mandate into a community-based WUA. On the other hand, it makes use of many of the most prestigious and experienced leaders in the area. In reality, the case of the Tân-Biên irrigated area demonstrates a significant diversity on the perspective and capacity of local cadres in PIM building. While some express deep understanding of the social and agriculture situation and great potential for PIM building, others are embedded in a rigid state management style of a bureaucratic command and control regime.

Additionally, farmers in the area, originally from different parts of southern and northern Vietnam, have been living in somewhat self-directed lifestyles since de-collectivization (in the late 1980s). Their independent farming system has con-

nected to the bureaucratic state system in which social authority and ability for social mobilization have been exercised at the hands of local cadres. Over time, autonomous organizations among farmers and cooperation in groups have become alien to farmers in this area.

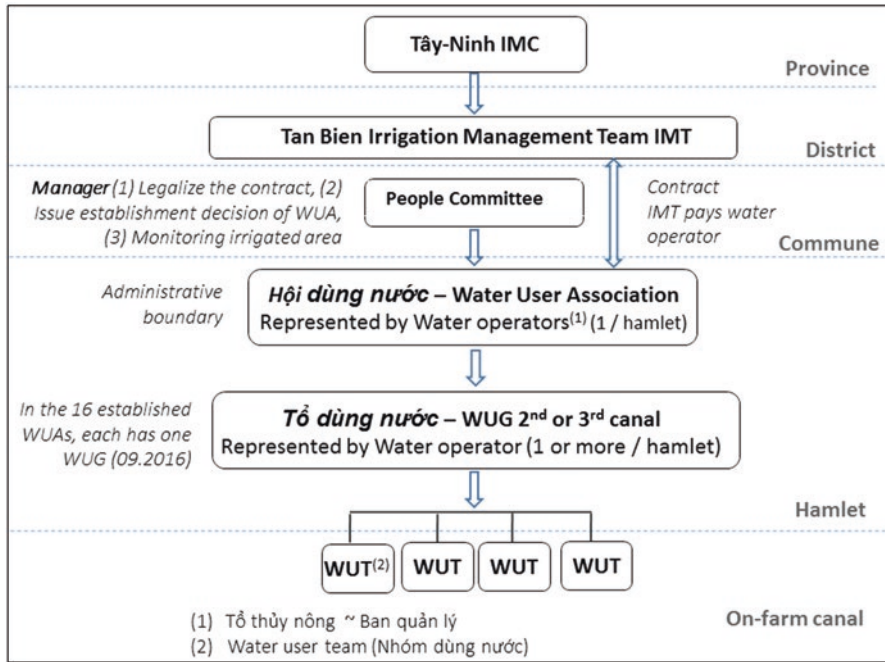
### ***16.3.2 Water User Associations (WUAs) Versus Water Operators: When Ideology Meets Reality***

Over the scope of their 2-year contract, the OSDP II team has adjusted the model of WUOs to be established in the area. The adjustment of this specific case is driven by a combination of different factors:

- The influence of the local existing model of irrigation management with Tô-Thủy-Nông (water operator) under the organizational line of IMC Tây-Ninh
- The model guided by PIM and WUG guidelines of the project to establish WUGs/WUAs with charters and rules
- The legal support of the collective economy regime in shaping the model of group into a precursor of the cooperative
- The limited time of a project, with project activities based on contracts with timelines that are often shorter than required for participatory-based work

In the Tân-Biên irrigated area, from June to September 2016, with guidance from the consultants, 16 WUAs were established. The boundaries of the WUAs were identified according to administration boundaries, hamlets in particular. According to the model of the OSDP consultants, one WUA is established in each hamlet. Each hamlet-WUA had one to several water user groups (WUGs). Each WUG would manage 100–150 ha of land irrigated by secondary and/or tertiary canals. Under each WUG is the water user team, comprising from one to seven farmers, who together maintain and share the water in one on-farm canal that brings water to their fields (Fig. 16.6). Each WUG has one or two water operators who are responsible for operating the gates, checking and reporting on the irrigated area, maintaining the canals, and playing an intermediate role between farmers and the company agency—which in this case is the Tân-Biên irrigation management team (IMT) under the Tây-Ninh IMC. All water operators together make one water operator group of the association WUA.

While the WUA provides the foundation for the management structure in the future of the expansion of the irrigated area, it manifests a complex structure that has worked mainly on paper. The three-level structure of management indeed confuses most other actors, from the Tân-Biên IMT to commune cadres and water operators. In each WUA established so far, there is only one WUG and one water operator. One exception is Phước Trung WUA, with two WUGs and two water operators.



**Fig. 16.6** Water user association model for Tân-Biên irrigated area, according to the Vietnam academy for water resources - on-farm and social development program. *IMC* irrigation management company, *IMT* irrigation management team, *WUA* water user association, *WUG* water user group, *WUT* water user team

### 16.3.2.1 The Formal Assembly and Election

The OSDP team facilitated the training and assembly of the 16 WUAs in 2016. The assemblies were organized by the lead of the OSDP team with a standardized structure (Fig. 16.7). The assembly or Đại-hội in Vietnamese has been part of the party-state system of Vietnam.<sup>18</sup> The Communist Party, the People’s Council assemblies from central to local levels,<sup>19</sup> and mass organizations (farmers, youths, women’s

<sup>18</sup> Ideologically, authority to run the nation-state in Vietnam goes beyond governmental institutions. A popular slogan promoted in Vietnam asserts: “The party leads, the people control, and the state manages.” As stated, the nation is managed by the state under the Communist Party, with the support of People’s Army, Fatherland Front, and mass organizations (e.g. for women, peasants, workers, youth) (Kerkvliet 2004:3–4). As at the state system, the Communist Party is present in all levels and forms of office (province, district) and with individual agents (commune and hamlet).

<sup>19</sup> Vietnam’s administration system has a top-down, four-level organizational structure: the central or national level, provincial level, district level, and commune level. Officially, the commune is the smallest unit of the state administrative system (Porter 1993). However, below the commune, there are hamlets with People’s Boards, cadres, or state assistants tasked with assisting the commune. In general, the central level includes the National Assembly, ministries (including the prime minister’s office and various departments), and the Supreme Court. These agencies fulfill the leg-



**Fig. 16.7** Water usage rules of WUAs and the assembly of WUAs in Thanh-Tây Hamlet, Thanh-Tây Commune, Tân-Biên perimeter (July 2016)

unions, etc.) all follow an identical model of organizing and assembly in order to report the activities (achievements) during the past term and the strategies and targets of the following one. During assemblies, election of the management board or leaders/representatives of the organizations is carried out.

For WUAs for the Tân-Biên perimeter, the experts decided on steps of the assembly:

- Introduction of delegates
- Introduction of the Phước-Hòa project
- Election of WUA's representative (or approval of the only nominee)
- The elected representative receiving an official decision from commune's leader
- The representative reading the rules and charters of the WUA

The assemblies were assessed to be informal with fewer bureaucratic procedures, shorter presentations, and a less formal atmosphere. However, the sections are organized and implemented by the experts (OSDP consultants) and local authorities with little involvement of the farmers—the supposed members of the WUA. The standardized procedures turned the assemblies into a step to officialize the WUA and the representatives.

In short, although it is not our intention to undermine the efforts of the consultants to apply the participatory process during the OSDP, both the organization's mode of operation and that of the WUAs were decided mainly by the experts, and

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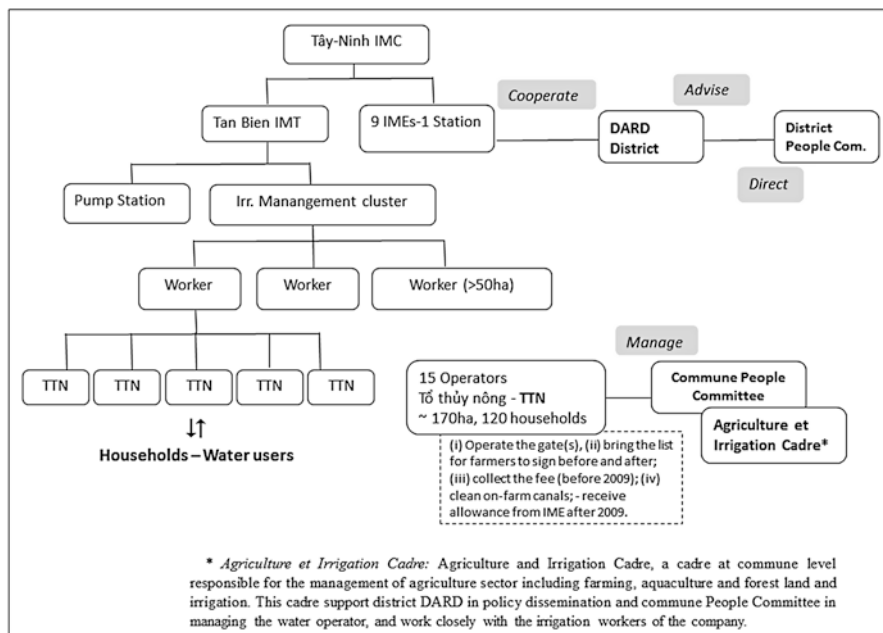
islative, executive, and judicial functions of the national government, respectively (*ibid*:73–83). At the province and district levels, the People's Council, People's Committee, and People's Court perform the legislative, executive, and judicial functions, respectively. Within the ministries exist three types of agencies: state management, non-business (generally translated as institutes), and business agencies. The latter two are governed primarily by the state management agencies (Molle and Hoanh 2008, cited in Waibel 2010:18).

the WUA's representatives were mobilized by the local cadres. There was a deviation between, on the one hand, understanding by OSDP consultants of the local situation and farmers' perspectives and, on the other hand, the rush to formulate a model for irrigation management at the local level by the end of OSDP II. This resulted from a difference between the project's timeline and the farmers'. While farmers are not ready to discuss any form of management because the water is not there yet, the project timeline required the OSDP consultants to establish the WUA through formal assemblies. Thus, the discussions of the model, rules, and charters did not yield much feedback from the water users, except some details on the amounts of fines applied for those breaking the rules. The official rules, charters, and WUAs were designed by OSDP consultants and approved in the meetings between PPMB and official cadres from the district office of DARD.

The election of the WUA's representative during the assembly remains symbolic. The establishment of the WUA was from the external force of the project, and the whole process is still very new to farmers. It gives no incentive and inadequate information for both the candidate and the voters. In this situation, project experts relied on local authorities to choose and mobilize potential candidates to take the position of community leaders in WUAs. Becoming a candidate for water operators became part of the state tradition of social leaders, of representatives that possess accountability both to the people and to the state system. Bureaucratic government language is used to explain the election process; notably election, nomination, direction, and inspection. In the end, despite the effort to create a structure autonomous from the state system, the formation of the WUA in the Tân-Biên irrigated area of the Phước-Hòa project reproduced the state structure of management in Vietnam with both its advantages and limitations.

### 16.3.2.2 The Local Backup for “Symbolic” Project's WUA

At the same time, the Tây-Ninh IMC and Tân-Biên IMT developed their own model, overlapping with many parts of the OSDP's model. The existing management structure for irrigation in Tây-Ninh since the 1990s includes a hierarchy, with IMC at the provincial level and the irrigation management enterprise (IME) at the district level, of which the newly established Tân-Biên IMT holds a position equal to that of the district IME. Each IME with a number of hydraulic workers takes responsibility of the O&M of irrigation-related structures in the district (e.g. opening gates, renovating or concrete lining the canals, and weeding). To reach the household level, the Tây-Ninh IMC has been working with the Tô-Thủy-Nông model (Fig. 16.8). “Tô” means group or organization; however, it points to individuals working in irrigation O&M of an area of tertiary and on-farm canals. Therefore, we call them the same name as water operators, the same as those of WUGs under WUAs established by the OSDP. Each water operator is nominated and mobilized by commune authority and works under the technical guidance of the IME's workers. Water operators are often responsible for an area of about 150–200 ha. Farmers when signing the



**Fig. 16.8** Irrigation management model of irrigation management company with irrigation management enterprise (IME) and water operator. *IMT* irrigation management team, *DARD* Department of Agriculture and Rural Development, *TTN* Tổ-Thủy-Nông, groups or individuals working in irrigation operation and maintenance of an area of tertiary and on-farm canals

confirmation for their irrigated land for a season (irrigated land registration) also authorize the water operator to sign the contract with the IME on their behalf.

Under this model, the Tân-Biên IMT worked with the commune cadres to choose water operators for 15 areas that are separated by hydrological boundaries (Fig. 16.9). This process took place at the same time as the OSDP, and the water operators who worked with the Tân-Biên irrigation team are the water operators nominated and elected in the WUA assemblies. However, the Tân-Biên IMT holds a different list of water operators and names them by canal number instead of by hamlet. Such overlap demonstrates a process of coevolution or mutual learning between the IMC’s people and the project’s PIM experts of the OSDP.

At present, the only working part of the OSDP’s WUA model is the water operator that overlaps with IMC model. At this stage of settling things down for system O&M, commune cadres play an even more crucial role of nominating and mobilizing individuals to take on the role of water operator, supporting the registration of irrigated land, resolving conflict, and playing an intermediate role between the Tân-Biên irrigation team and water operators and farmers. This role of communes is

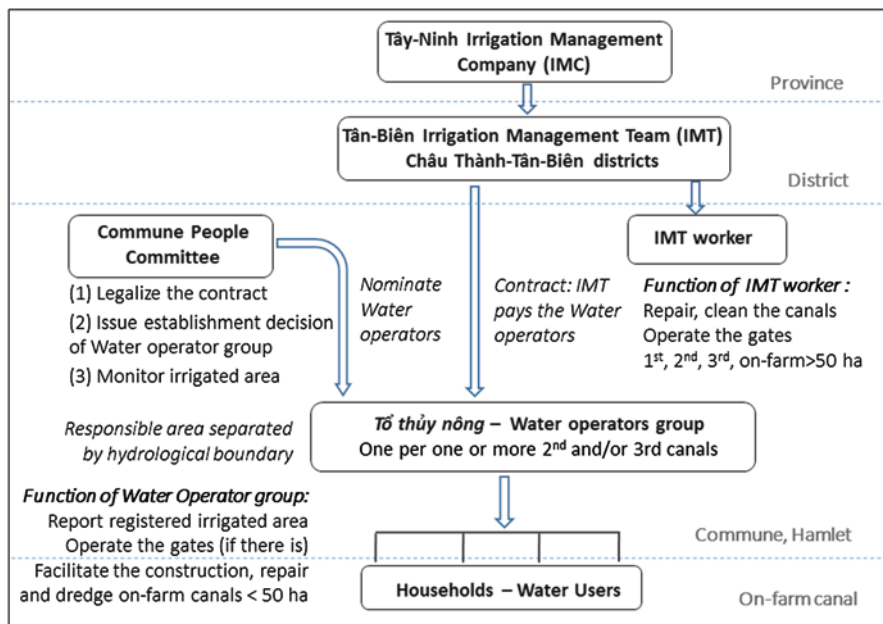


Fig. 16.9 Water operator model for irrigation management of Tây-Ninh IMC

stated in the charter and rules of WUAs (drafted by OSDP team) and by the charter on the cooperation among IMC, its line agency, and the local authority.<sup>20</sup>

### 16.3.3 The Story of On-Farm Canals

On-farm canals are either quaternary, tertiary, or secondary canals connecting to the system to convey water to irrigate areas at the field level. In this project, it is the farmer’s responsibility to connect to the PST system invested by the project. Making the on-farm canal is the final link in the chain and a crucial one in connecting the irrigation system to its designed area of irrigation. The responsibility of creating these canals belongs to the local actors, including the provincial management board, IMC and its line agency, the commune government, and farmers. There is no currently available channel of funding for such canals besides the contributions from farmers. The idea is to create space for farmers’ participation in the irrigation system, and social cooperation generates accountability and a sense of ownership from

<sup>20</sup>Regulated by decision 2147/QĐ-UBND, dated 14 October 2009 of the provincial People’s Committee, to issue the coordination mechanism in activities to manage, exploit, and protect the irrigation infrastructure between the Tây-Ninh irrigation exploitation company and the People’s Committee of the districts and towns.



the farmers. However, it is challenged by the individual farming regime that is dominant in the area and the institutions that are already established. The institutions of “free water” (since the ISF exemption) and “the state caring for the people” (with free infrastructure and good compensation for land acquisition) have resulted in some common reactions, namely, waiting for state support for on-farm canals, the belief that the irrigation company should invest in the on-farm canals in order to collect the fees later, and so on.

The donor is discussing the option of financial support for participatory design of on-farm canals as an additional work package. Approval of the package took quite a long time due to disagreement between the OSDP supervision consultants (SCP-HECII) and PPMB. The first proposal was framed by PPMB with the support of the same consultants that conducted the OSDP programs, as early as during OSDP II. This is a common practice, but not in all cases. By supporting PPMB in framing the proposal, the consultants hope to assure their advantage during the tendering process. However, the process took much longer than expected. The first proposal finished in April 2016 by the consultants focused on designing all on-farm canals (516 canals, or 300 canals in the later decision), and stipulated that the design must be done in about 6 months. The project international consultants for OSDP II were chosen by Société du Canal de Provence (SCP) in cooperation with the hydraulic engineering consultants corporation No.II - HEC II. The current research project’s result indicates it is unnecessary to design all on-farm canals in a short period; rather, a one-by-one case basis is recommended, based on the need of the farmers who will potentially use water from that canal. The international consultant team agreed with this recommendation. In addition, the PPMB also doubted the rationality of the designing of all canals but did not express the idea to the donor.<sup>21</sup> Thus, after back-and-forth communication between the donor (AFD), project management boards at the central level (ICMB9) and provincial level (PPMB), researchers, and project consultants (SCP-HEC II), in April 2017 a new proposal was being prepared by SCP. The present idea is to design not all but some canals and to pay more attention to local conditions and farmer needs. Observation on the subject continues. Such a transition happened thanks to the exchange between the project donor, the project consultants, the provincial management board, and the project research group. Yet, the long planning process is not always a good thing because the delay is causing problems for the project timeline and fund mobilization; some even doubt that it will be decided by the end of the financial timeline in March 2018.

While the project’s work for on-farm design is discussed by the experts and decision makers, local actors in Tây-Ninh, including the IMC, commune government, and farmers, are already at work on the canals. The very first on-farm canal made by farmers, made of brick,<sup>22</sup> was completed in June 2016 by farmer initiation (case N16-1, Phước Vinh commune). Another case in Thanh-Tây commune is guided by

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<sup>21</sup>This dynamic in communication between stakeholders in the project is framed by the idea of “it is in the wish of the donor” in negotiating the rationality in a water development project. More analysis of this aspect is planned as part of the ongoing research project.

<sup>22</sup>Brick is building material used to make walls, pavements, and other elements in masonry construction. A brick can be composed of clay-bearing soil, either fired or not. The one used for the on-farm canal in Phước Vinh is the fired type.



**Fig. 16.10** A brick on-farm canal made by farmers (N16-1-10 at Phước Vinh commune), June 2016 (left) and collective work to build an on-farm canal (N 2-22-1-11 at Thanh-Tây commune), March 2017 (right)

the commune authority and is now under discussion (case N 2-22-1) (Fig. 16.10). A conclusion from the two case studies (which are presented in detail in Pannier and Huynh 2016) is that making an on-farm canal as a form of collective action could be derived from and limited by various factors, including natural factors (climate/rainfall, groundwater availability, soil characteristics, and reposition of the plots relative to roads, transport conduits, canals, and tube wells), pre-existing infrastructure for irrigation and drainage, agricultural features such as cropping patterns and farming techniques, and human and social factors (previous experience, observations, and information about canal irrigation; solidarity, moral obligations, and social cohesion, including kinship and neighbor relations; and the articulation of individual logics and collective dynamics). The extent of influence of each factor varies between cases, and there are signs of interrelation between them. One can make another more important or limit another's impact. Because these factors determine the motivation and the capacity of farmers to engage in on-farm canal building, they should be taken in consideration in order to foster and design on-farm canals in the Phước-Hòa project area.

Above all, the principle of having reliable water, that is, the trust of farmers in the working capacity of the system, is the first condition for any action to be taken. As farmers repeatedly respond when asked if they would participate in making on-farm canals: "It depends if there is enough and constant water in the tertiary canal" (inter-

view 21.12.2016, Thanh-Tây commune). With the current continuous flow, operation seems to be on demand and has been done in a flexible way with personal communication between farmers and water operators, and with day-to-day negotiation between water users.

In other words, the building of each on-farm canal is a unique case and cannot be standardized. Such a process includes informal negotiation and arrangement between a group of farmers who share the delivered water and maintain the on-farm canal that brings water to their fields.

## 16.4 Discussion

Regarding the process of establishing WUAs in the Tân-Biên perimeter, the question is whether it is more judicious to set up the organization of water users before versus after the canal network becomes operational. In implementing the OSDP II, the consultants of OSDP, as approved by the project managers and the donor, chose the first option. They reasoned that this approach would allow the establishment of a collective organizational structure that will be ready for operation as soon as the perimeter is put into service. Even though the reason appears to be logical, its implementation created doubts about its suitability due to constraints described in the previous section.

To summarize, consultants in charge of the implementation of OSDP II adopted a top-down approach that limited adequate participation of future users. In concrete terms, the procedure for preparing collective organization models was standardized and unified: the statutes and rules for running water user associations (WUAs) had been reproduced everywhere in the perimeter almost word for word. The consultant team was thus not allowed or able to fulfill its role as an intermediary between the directive approach of the project and the expectations and doubts of the farmers. The latter are increasingly skeptical about the successive reports regarding the delay in the construction of the perimeter and certain technical constraints in the system's design.

Several reasons may explain the choice for this order of project activities, in contrast to the very basic principle of the PIM approach. On the one hand, the consultants had only 6 months to set up the 16 WUAs although some training on how to operate and manage an irrigation system collectively had been organized. On the other hand, they confined themselves to following the requirements specified and fixed by the terms of reference (TORs), or the project charter. The TORs, with technocratic and directive characteristics, forced them to carry out the tasks in the same way as filling in a checklist, and all strived to quantify their interventions (number of meetings organized, number of local people participated in project's trainings, and so on). Finally, the dual absence of international expertise (late participation of the SCP) and PIM specialists (social scientists) did not allow proper implementation of the OSDP. None of the above experts were there to oversee and monitor the second phase, to assess its relevance, and to look critically at what already exists, that is, the results obtained at the end of the first phase.

Today in Tân-Biên, there is a mismatch between reality and the language that has been applied to identify it. One may question whether the OSDP consultants noticed the differences; the answer is yes. However, put another way, the OSDP consultants are forced to complete the contract they signed. Thus, under the constraints of institutions and the lack of direct communication between project partners, PIM and WUAs have been applied in the Tân-Biên area as a predesigned model, not built from local context.

### ***16.4.1 Power Leverage in the Project's Negotiation***

The 16 WUAs reported in project documents and formally recognized by the commune authority by a formal decision are under the scrutiny of local actors. Local actors, including engineers from the Tân-Biên IMT, the commune authority holding the function of state management or human management, the newly elected water operators and other farmers, all preserve and present their opinions about the relevant WUA and wait and see how it could fit into the local context. In the meantime, the model of IMC's water operator guided by the Tân-Biên IMT, or one part of WUAs, is ongoing. Above all, confused and unclear about the benefit of different models, the water users can withhold a decision to participate. Such wait-and-see behavior is embedded in the farmers' daily practices, as individuals constantly negotiate and bargain with different factors to earn a living. Thus, while being inferior to local authorities in power leverage, especially as expressed in public meetings and project training (rarely raising an opposing voice), farmers or water users in the area retain a power to decide on participation in state/project-initiated activities, and thereby hold at least passive power in decision making.

In implementing the development project of Phước-Hòa, the extent of different power capacities of the state has been expressed differently. The state might perform a directive power in the first phase with land acquisition and compensation, and infrastructural power<sup>23</sup> with a legal framework during the whole process of the project. The process of land acquisition and compensation in the Phước-Hòa project indeed contains a complex directive power of the state, infrastructural power (the principle of the state as the manager of all natural resources, and the farmers return the rent land when needed), and promoting the idea of a caring state (good market price for land compensation, for instance). At the latter stage where farmer cooperation for WUAs and making on-farm canals is needed, in implementing the project's model of PIM and of the grassroots democracy policy of the government, a discour-

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<sup>23</sup>The regulatory power exerted by institutions and organizations, including the state embeddedness in society (Göbel 2011). Göbel (2011) categorizes a state based on its capacity to wield three kinds of power: coercive power to impose its will on the people (despotic power); regulatory power exerted by institutions and organizations (infrastructural power), including the state embeddedness in society; and the power to make people want what the government wants them to want (discursive power) (ibid:177, Lukes 1975/2005).

sive power extended with a mobilization strategy becomes the dominant part of state power. At the same time, in the process of negotiating the making of on-farm canals, farmers express their discursive power in negotiating the activities. Power leverage is achieved by both state decisions for performing discursive power and farmer power decisions about their own interests in the use of their own private land. Local knowledge of their own fields and of customized farming practices are also assets for farmers when they enter negotiations. Thus, when it comes to on-farm canal negotiations after a bureaucratic checklist of a time-limited project is completed, the negotiations manifest a process of mutual learning between the state (local cadres plus IMC engineers) and water users. We may call it co-evolution, as similarly proven in the case of collective drainage arrangements in the Mekong Delta (Huynh 2016). In that research, the author concludes that “it is in the everyday dialogue that, in the co-existence of hierarchical state management structure and the space of local flexibility, officially and unofficially refines the local practices.” In practice, water governance in these cases in Vietnam is complex and an interaction between formal arrangements and informal interactions.

#### ***16.4.2 PIM Implementation in a Development Project in the Vietnamese Context***

The WUA model remains a new idea introduced into the area by the people running the project—by OSDP consultants in particular. By implementing the WUA model, a model preshaped by experts and agreed upon by provincial cadres, the farmers have learned the model rather than having built the model for their own irrigation management. In other words, participation in this case remains at the consulting level, and the perspective and requests from the water users might or might not be taken into account (see the extended ladder of participation in Bruns 2003).

The case of the OSDP in the Phước-Hòa project demonstrates that, with the current approach and present situation, the idea of autonomy from the state and the attempt to build an equitable relation as “the purchaser—the seller” between WUGs and the IMC (according to PIM guideline 2004) are both legally unfit and practically ineffective. While PIM remains an outside ideal terminology, the participation of the people in state matters and the WUGs are regulated officially by legal documents. Through grassroots democracy policy, the participation of the people in state matters has been promoted. However, in the bureaucratic implementation of the policy, the participation of the water users is set as a “designed or regulated participation”, which is very much top-down and bureaucratic. According MARD’s Central Project Office for Water Projects (CPO 2012), the participation of citizens is regulated:

Methods of participation include participating (for opinion) when asked, reviewing when requested, participating in monitoring (according to regulation), participating into designing, construction and management (attached with responsibilities and benefits), participat-

ing in financial contribution according to regulations (procedure, policy) and all requests during the process from planning, designing, investing, constructing and managing. (CPO 2012)

Participation by and large continues following steps that are pre-designed by the state and implemented by the consultants; all of this manifests the strong influence of the existing government structure.

Building PIM, especially in Vietnam, requires a consistent intervention both in legal frameworks and on the ground. Huge efforts and time are needed to build the capacity for local actors in managing a new form of irrigation with more cooperation and coordination features. More importantly, changing the perspectives and habits of local actors, including both cadres and farmers, to cooperative in irrigation and farming takes even more time, and a different approach is needed. The Phước-Hòa project, as a development project supported by international loans, is restricted by both international and national institutions and by a limited timeline. In the case of PIM applications in the Tân-Biên area, the project timeline did not fit farmer timelines. Training about PIM and establishment of WUAs as required by the project happened way ahead of time when farmers did not see (reliable) water in the canals and thus had not yet assessed the benefit of switching from groundwater to canal irrigation, and from the individual to cooperative style. They received non-voluntary participation from the water users (not by force, but by financial encouragement and social prestige of local authority and experts). It is even more challenging and time-consuming for an intervention to be effective relative to the diversity of cropping patterns, where land use shifts over time (from sugarcane to cassava to rubber, then to vegetables). As a result, PIM and WUAs remain alien to the water users. At the donor level, the need for longer time in building PIM is recognized: “Successful irrigation and drainage projects require participation by all stakeholders in planning, implementation, and O&M to create a sense of ownership of and consequent commitment to the project. This requires that project planning allows time for beneficiaries to participate in planning and influence decisions affecting their future” (ADB 2012). However, project institutions with complex procedures often leave few opportunities for flexibility and adequate time.

The case of PIM implementation in Phước-Hòa project demonstrates how components for certain objectives become an end in itself. WUG or WUA is only a tool or an option in building PIM, yet over time it becomes one target to reach in a project. The link between WUG and PIM is strongly supported by project guidelines (CPO 2004) and is a must as regulated by Vietnamese institutions:

Participation has to be through organization, agency that is established with legal status. This is the prerequisite for participation. In cases of individuals, households that use water from irrigation structure have to participate through their water user organization; the organization is established according to the law, has legal status and is financially autonomous. (CPO 2012)

The Tân-Biên case illustrates that the formal institutionalized and standardized organization of the WUA is not applicable due to diverse conditions between areas and between zones in each area of the irrigated perimeter. Also, in some cases, water

distribution could be done easily by informal agreement and everyday dialogue between water users, and no organization or standardized rules and charters is needed.

### ***16.4.3 Justifying the Possible Forms of User Organizations***

As demonstrated by the IMC's Tây-Ninh system, self-organization for water appropriation is possible for ten farmers. To supply irrigation water for a bigger group, the IMC worked with affiliated workers and water operators to collect data on water demand, operate the gate, and maintain the canals. The water operators have acted as affiliated workers of the company throughout that time. Due to the Vietnamese policy in promoting local organization, the water operators have been put into the frame of an organization in which they are the leader. Technically, the water operators who worked with single farmers are officialized in Phước-Hòa's project with the status of representative of the WUAs, an official organization. The Phước-Hòa project became contiguous with another, previous PIM development project in Tây-Ninh (e.g. VWRAP) in promoting a form of WUO with standardized rules and operation mechanisms at a larger scale. Such a larger scale of organization (often at the tertiary canal level) is not suitable, as proven in the 30-year experience of managing the system, according to the IMC's representative (interview 05.07.2016).

Beyond the obstacles of the WUAs established, the very model of irrigation management based on collective organization of farmers into WUAs and water users groups (WUGs) must be brought into question. Indeed, the actual procedures to structure and define the functioning of a group of human beings reflect not so much their formal organization as the fruit of the relations between the actors that develop within the group and with the outside world. It is common to attempt to explain the collective action and the coherence of the group as the "natural" result of a unity of goals and interests that guide the involvement of players. However,

in reality, apart from the case of very small groups, unless coercive measures or some other specific provisions exist that incite them to act in their common interest, reasonable and interested individuals will not voluntarily try to defend the interests of the group. ... Thus, the common belief that groups of people with common interests tend to defend them seems to have very little or no basis in reality. (Olson 1978: 22–23)

Among a number of potential advantages of the user organizations, three stand out. (a) These forms of collective organizations constitute, for the decision makers within, legitimate intermediaries who opt to establish a power balance with the representatives of the public powers (e.g. local governmental agencies, the IMC). (b) They are equipped with a legal capacity that allows them to negotiate directly with the water companies. (c) Because of the size and complexity of the irrigation networks (with three or four levels of canal connection and with the new, modern concrete infrastructure), the present established informal structure for social negotiation of resource use might not be enough. Despite the possible advantage that a

formal organization could provide, it should not diminish the ongoing social dynamic in which informal arrangements continue playing their role and entering institutional negotiations. By this process, new arrangements will be established through time, and this is neither new nor old, neither formal nor informal. They represent the “bricolage” of institutions (as defined by Cleaver 2012) through which rules and norms are refined into practices. It makes the implementation of a standard operating mode based on the basic WUG and WUA units challenging.

In the case of the Phước-Hòa project, it is therefore appropriate to raise questions about the existence of a shared or common goal for all users of one WUG. Researchers conducted in irrigation management throughout the world demonstrate cases where farmers accept and comply with collective rules in water distribution for three main reasons:

1. The available resource is scarce, so coordination is needed.
2. Payment for water access is needed, so an intermediate body to carry out the task is required.
3. Opportunity costs for alternative (e.g., individual groundwater pumping) are higher than cooperating in a group for canal water.

While the first factor is present in the Tân-Biên perimeter, the other two factors are still missing, as the fees will not be collected for at least another 3 years, and groundwater pumping remains convenient and affordable. More importantly, the situation varies greatly between units of irrigation area, which implies great uncertainty for collective organization at the local level.

## 16.5 Final Remarks

Water institutions in the Đồng-Nai basin are continuously negotiated and contested in practice, by various actors who differ not only in terms of interest, scale, and power but also in the conditions they experience in the face of ecological and agricultural changes and challenges. The Phước-Hòa development project follows the current tendency of combining both conventional hard measures of construction with institutional intervention such as an on-farm and social development program (OSDP). The OSDP is seen as a plus in the attempt to apply integrated measures for water management. However, the project’s procedure involved a complex hierarchy that followed the international and Vietnamese state structure within a restricted timeline, which shaped the PIM into a top-down approach with little impact on institutional improvement. Vietnam has long participated in a global policy trend in water development that is dominated by a technocratic approach. Hard infrastructure construction has become the main solution to facilitate the intensification of agriculture production and to mitigate the impact of floods. The technocratic approach to water resources management remains to be a dominant approach within the “hydrocracy” (hydraulic bureaucracy) in Vietnam (Benedikter 2014). Even



under the influence of integrated water resources management (IWRM<sup>24</sup>) ideology, institutional inertia remains strong in shaping the legacy of all interventions.

The current challenge lies in the difficulty of defining the right unit for action in a context of shifting environmental and social conditions. Development projects and interventions are often initiated at the central level and by way of governmental structure of management. However, as asserted in the case of PIM and irrigation management transfer in the Beni Amir irrigation scheme in Morocco, “The existence of a strong central government can be, at the same time, a catalyser and a restraint for the PIM/IMT process: a catalyst because a real motivation of a central government can speed up the process, but a restraint because of the difficulty to change strong bureaucracies” (Van Vuren et al. 2004). A similar situation is demonstrated in the Tân-Biên case, where the strong influence of state institutions supported the dissemination of a new ideology of cooperative water management yet shaped the top-down approach and the implementation of PIM models rather than building PIM from within.

A main lesson from the Tân-Biên case is the need for a better approach at the local level that will also facilitate more flexibility in building water institutions. Pannier and Huynh (2016) conclude that the rules and norms that shape local water management derive mainly from daily interactions and negotiations between stakeholders and thus are subjected to change and negotiation all the time. The institutions tend to be a continuous “bricolage” of rules and norms that are applicable for each specific case. As such, Ostrom’s statement about crafting institutions for water management is fitting for this case:

The crafting of irrigation institutions is an ongoing process that must directly involve the users and suppliers of irrigation water throughout the design process. Instead of designing a single blueprint for water-user organizations to be adopted on all irrigation systems within a jurisdiction, officials need to enhance the capability of suppliers and users to design their own institutions. Involving suppliers and users directly will help ensure that development institutions are well matched to the particular physical, economic, and cultural environment of each system. Although this approach presumes that the participants need to be involved in the design process, it does not presume that good institutional designs spring up naturally as the result of spontaneous organization. Government officials and donor agencies can and should play an active role in enhancing the design process and monitoring the results. The role proposed for central governmental officials and for donor agencies is, however, quite different from that proposed by earlier studies that called for the creation of many user organizations based on the same institutional design. (Ostrom 1992:14)

This statement, from back in 1992, and the PIM concept and participatory approach indeed support a mechanism that suits each specific context. This empirical case of the Phước-Hòa project demonstrates the distance between the ideal principles and the application of the PIM concept for better water governance, and between what should be done and what can be done. In this case, the time restriction of the

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<sup>24</sup>IWRM is a process that promotes the coordinated development and management of water, land, and related resources, in order to maximize the resultant economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems (defined by Global Water Partnership).

development project, other factors of human expertise for PIM, and the localized context of management structure become limiting factors to the successful application of this participatory approach. The case demonstrates how institutions help shape irrigation governance. It continuously involves the complex coexistence of rules and norms that, through interactions between stakeholders in the project and in everyday activities, refines the choice of practices. Through this process, all stakeholders are engaged in different arenas of negotiation in which power leverage is exercised in a complex dynamic. The water users, while presumably the most advantaged group, express their power leverage with discursive or passive power.

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