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Water Management through the Lenses of Gender, Ethnicity and Class: A Comparative Case Study of Upstream and Downstream Sites on the Mekong River in the Mekong Delta of Vietnam [1]

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Abstract

Issues related to water resources upstream (Tan Ho Co commune) and downstream (Dai An commune) of the Mekong Delta in Vietnam were studied. The role of gender, ethnicity and class in water management was ascertained. Social qualitative research, using in-depth interviews of local respondents was undertaken and ethnographic field strategies were adopted during field trips to record real-time observations.

Access to water resources varied among men and women; the rich, poor and middle classes; and, various ethnic groups. Participation in the decision-making processes related to water in households and communities varied greatly among men, women and members of different ethnicities and classes. At the community level, a bottom-up approach as per the national structure system was adopted for decision-making processes, with local institutional arrangements being based on the involvement of local people.

Water resource was important for local upstream and downstream communities for domestic use and livelihood activities. Along with declining quality and quantity due to human activities and development, local people in upstream sites faced flooding and pollution while those downstream faced saltwater intrusion. Upstream activities impacted downstream communities and water conflict was evident in the whole Mekong Delta region. Water for women was associated with domestic activities while, for men, it was for livelihood activities. Local communities were less involved in decision-making processes related to water. Female gender and lower income levels affected health adversely by way of poor sanitation and limited water availability.

Approach different from the national policy seems to have caused misunderstanding for local ethnic groups, as their management structure was quite different from that among Khmer ethnic group generally. Participation in meetings was influenced by the language used. Local government officers considered water to be unimportant and preferred less water management. There was no collaboration between upstream and downstream communities.

Keywords: class, decision-making, ethnicity, gender, water resources

Biography

Dang is currently a researcher in the Department of Socio-Economic and Policy Studies, Mekong Delta Development Research Institute at Can Tho University in Vietnam.

Dang holds a bachelors degree in environment sciences from the University of Natural Science of Ho Chi Minh City, Vietnam (2007) and an International Master of Advanced Studies in Development Studies from the Graduate Institute in Geneva, Switzerland (2012).

Dang has several years of experience in the development field in the Mekong Delta and in Mekong Region countries. He held an M-Power Fellowship (2012) and was a ASEAN-Canada Junior Fellow (2013-2014). In both positions, he focused on water governance. He was a part of a Thailand Environment (TEI) and Swedish International Development Cooperation Agency (SIDA) partnership programme on climate change adaptation and natural resource management studies in 2014-2015.

He was a wildlife conservation education fellow with Bat Conservation International (2008 and 2010) and with the Rufford Foundation (2013 and 2015). Dang also participated in a young leadership program supported by the Joke Waller-Hunter Initiative, organized by Both Ends, a Dutch organization. In 2015, he was selected as a Young Southeast Asian Leaders Initiative (YSEALI) Fellow in Montana and the D.C of The United States of America.

Earth Rights International and the Rufford Foundation, among others, have published Dang's research. He is currently working on two papers and articles for future publications on social norm and rules of water management in Khmer Ethnic Group communities in the Mekong Delta, and the conflicts in water management in coastal area of the Mekong Delta. Dang has just approved for his publication on "Ecotourism in Costa Rica and Vietnam: Is It Sustainable?" written with coauthors Scott G. McNall and Teresa Sobieszcyk for publication in Sustainability: The Journal of Record. It is set to be featured in Volume 9, Issue 3 of the journal.

Introduction

Background

Water is the lifeblood of communities and households in the Mekong Delta. Men and women have different roles and responsibilities for obtaining and using water, thus it is important to explore gender differences in the context of community, class and ethnicity.[2] This study will explore water management in the Mekong Delta, focusing on the roles and responsibilities of men and women from two communes – one located upstream in Dong Thap province and the other downstream in Tra Vinh province. To the author's knowledge, this is the first study that assesses water management in Vietnam's Mekong Delta using gender, ethnicity and class analyses. The findings may inform government and non-profit organisations, policymakers, lawyers, journalists and local people.

Research objectives

Water is a critical resource in the ASEAN region and will likely increase in importance as upstream damming, global warming, and regional industrial and agricultural wastes make clean water scarcer.[3] This study will focus on four main areas: (i) water-use problems that communities face in dealing with water management, and the men and women in the communities affected by these problems; (ii) how water use relates to men's and women's livelihoods, and how this relationship differs with class and ethnicity; (iii) the roles and responsibilities of men and women in communities in relation to water use and the decision-making process regarding water management, and how this may vary by class and/or ethnicity; and, (iv) how the two communities differ in terms of water issues and social and policy contexts, as well as the implications of these differences for water management.

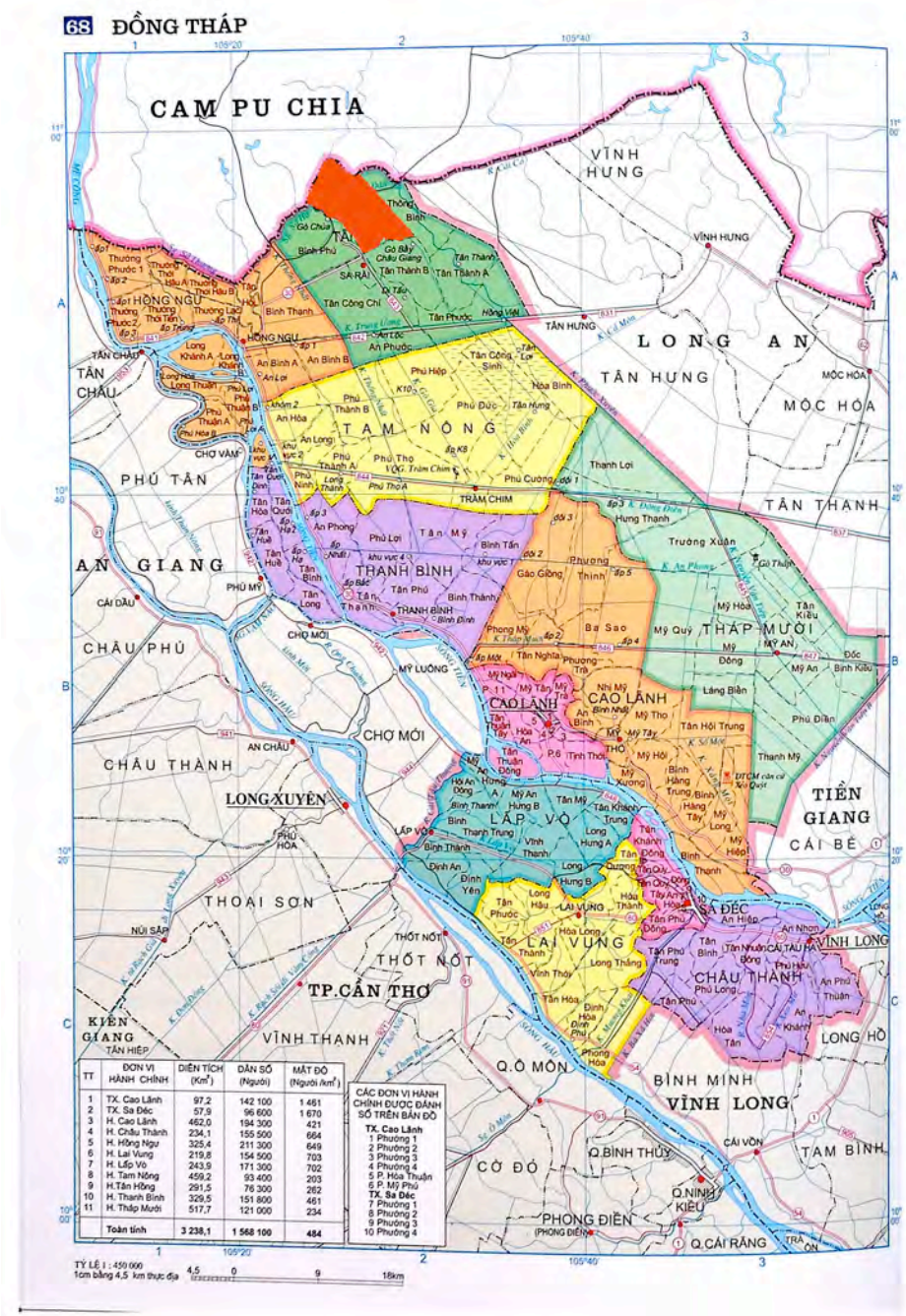
Study Sites

The upstream site: Tan Ho Co commune, Dong Thap province

Tan Ho Co commune (study site; Figure 1), from the Tan Hong district of Dong Thap province, is a rural subdistrict located in the Mekong Delta in Vietnam. The subdistrict is about 90 km to the east of Cao Lanh City, which is the centre of Dong Thap province, and borders with Cambodia to the west. The number of poor households in the subdistrict is high and most hail from other locations in Vietnam. People who have access to clean water supply and hygiene latrines are few (among the lowest in the province), and its integrated water system (irrigation system) is quite difficult to develop and plan, as the area is higher up than other lands in the province. One main canal flows to the community and water is then transferred to the commune's lands (e.g., rice farms, vegetable farms, fish ponds, and so on) via smaller canals (*kênh*) developed and built by the district-level government office. The research site in the subdistrict was divided into two parts outside and inside of the dyke or, in other words, as 'protected' and 'unprotected' areas during flooding that was caused by water inundation from upstream sites of the Mekong River.

[2] Patricia Hill Collins, 'Intersections of race, class, gender and nation: Some implication for Black family studies', *Journal of Comparative Family Studies* 29 (1998): 27–36.
[3] Ibid.

Figure 1: Study site upstream of the Mekong Delta in Dong Thap province.



TT	ĐƠN VỊ HÀNH CHÍNH	DIỆN TÍCH (Km²)	DÂN SỐ (Người)	MẬT ĐỘ (Người/km²)
1	TX. Cao Lãnh	97,2	142 100	1 461
2	TX. Sa Đéc	57,9	96 600	1 670
3	H. Cao Lãnh	462,0	194 300	421
4	H. Châu Thành	234,1	155 500	664
5	H. Hồng Ngự	325,4	211 300	649
6	H. Lai Vung	219,8	154 500	703
7	H. Lấp Vò	243,9	171 300	702
8	H. Tam Nông	459,2	93 400	203
9	H.Tân Hồng	291,5	76 300	262
10	H. Thanh Bình	329,5	151 800	461
11	H. Tháp Mười	517,7	121 000	234
	Toàn tỉnh	3 238,1	1 568 100	484

CÁC ĐƠN VỊ HÀNH CHÍNH ĐƯỢC ĐÁNH SỐ TRÊN BẢN ĐỒ

TX. Cao Lãnh
1 Phường 1
2 Phường 2
3 Phường 3
4 Phường 4
5 P. Hòa Thuận
6 P. Mỹ Phú
TX. Sa Đéc
7 Phường 1
8 Phường 2
9 Phường 3
10 Phường 4

Source: Dong Thap Provincial People's Committee, 2014.

The Tan Ho Co subdistrict has little over 2,683 households, with a population of over 10,509, [4] belonging to the Kinh and Khmer ethnic groups – a few members living along the border area originate from Cambodia and do not recognise themselves as Vietnamese; these people live in the commune without identification cards. Most of the population are from the Kinh group (which is also the major ethnic group in

[4] Ibid.

Vietnam, making up 86 per cent of the country's population.[5] There were just over 10 households (40 members) belonging to the Khmer ethnic group. There are more women (n = 5,780) than men (n = 4,729). According to class, the population could be separated into three groups, including lower class, middle class and upper class households (n = 804).

Local livelihood activities in Tan Ho Co are mainly rice cultivation, livestock production, fish farming (catfish), vegetable and fruit farming, small businesses, and labour renting to bigger cities or other countries (Table 1).

Table 1: Main livelihood activities in the local community upstream of the Mekong Delta in Dong Thap province.

Activity	**Cultivation schedule**
Rice farming (varieties 6162, 4900 and 5451)	Protected area: thrice a year Unprotected area: twice a year
Vegetable farming (e.g., salad vegetables, broccoli, pumpkin, cucumber, corn)	Year round
Fruit farming (e.g., mango, water melon, coconut, papaya; fruit juices)	Year round
Grass*	Year round
Fish farming (catfish)	Year round
Livestock and poultry production	Year round
Eucalyptus	Year round

* For feeding cows and buffaloes.
Source: Primary data gathered from local households at the Tan Ho Co commune, 2014.

Water management. The numbers of people who had access to clean water and toilets were the lowest in the province. Flooding and inundation in this community were due to water from the Mekong River, which flows through the So Ha River from June to October every year; water from upstream areas of the Mekong River flows strongly downstream. Water pollution is caused by many sources, including natural causes, fish farming activities, pesticide and fertiliser use for rice farming, and domestic activities. Annual rains from May to November were a key source of water for the local community, and water, from both rain and river, was used for rice farming and other farming activities. Drought and lack of freshwater was common from November till April.

The dyke system that covers the protected area was built and developed by the government, with contributions from the community, private sector and sponsors from international agencies. People plant rice three times a year as the crop remains unaffected by flooding and inundation from the river. The dyke is high along the land, and water is transferred by pumping using machines rented from householders living and working in the area or owning land. The unprotected area, in some parts of the study site, was yet open land, meaning that floodwater from the river flows easily into the field during flooding season. The local community here planted two rice crops in

[5] Home Office. (2014, December). Country Information and Guidance- Vietnam: Ethnic Minority Groups. Retrieved June 13, 2016, from https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/389930/CIG.Vietnam.Ethnic_Minority_Groups.v1.0.pdf

a year. A dyke is planned for this area too, so that local people can intensify agricultural activities on their lands.

The downstream site: Dai An commune, Tra Vinh province

Dai An commune (Figure 2), the site of study in Tra Vinh province, is an upstream rural subdistrict located in the Mekong Delta, Vietnam. The subdistrict is about 40 km northwest of Tra Vinh City, which is the centre of Tra Vinh province, and is next to the East Sea of Vietnam. The number of poor and near-poor households (n = 11,034) in the subdistrict is high, and most hail from other locations in Vietnam. Similar to Tan Ho Co, the number of people who had access to clean water supply and hygiene latrines in Dai An commune was low (n = 3,789 households) and among the lowest in the province. Here too, the integrated water system (irrigation system) is quite difficult to develop and plan, as the area is higher than other lands in the province. Two main rivers flow to the community – Hau River to the south and Tien River to the north. Water comes from the Tien River during the dry season (from December to August), due to closing of the sluice gates along the subdistrict, and from the Hau River during raining season (from September to November), when freshwater from upstream sources pushes saltwater to the sea. During the raining season, the sluice gates remain open and water from the Tien River is reduced. When water flows to the subdistrict, it is transferred to whole lands (such as rice farms, fish farms, vegetable farms, etc.) and other locations by small canals (*kênh địa phương*) that operate from one main canal (canal number 2, type 2). The canals have been developed and built according to local government plans. The study site was divided into two parts outside and inside of the South Mang Thit Sub-project (SMTS; dyke), or in other words as protected and unprotected areas by saltwater intrusion from the sea during the dry season.

Figure 2: Study site downstream of the Mekong Delta in Tra Vinh province.

Source: Provincial People's Committee, 2014.

The Dai An subdistrict has a little over 2,656 households, with a population of over 12,280[6], belonging to the Kinh and Khmer ethnic groups. However, unlike Tan Ho Co, most of the population in Dai An are from the Khmer group. There are more men (n = 6,754) than women (n = 5,526). There were 1,062 households with 4,912 members belonging to the Kinh ethnic group. According to class, the population could be separated into three groups, including poor and near-poor households (n = 999 households; n = 4,795 members).

Local livelihood activities in Dai An are also mainly rice cultivation, livestock production, fish (dragon fish) and shrimp farming, vegetable and fruit farming, small businesses, and labour renting to bigger cities or other countries (Table 2).

Table 2: Main livelihood activities in the local community downstream of the Mekong Delta in Tra Vinh province.

Activity	**Cultivation schedule**
Rice farming (*siêu* seeds, varieties 6162, 4900 and 5451)	Protected area: twice a year Unprotected area: one a year
Vegetable farming* (e.g., salad vegetables, broccoli, pumpkin, cucumber, corn)	Year round
Fruit farming (e.g., mango, water melon, coconut, papaya; fruit juices)	Year round
Bamboo**	Year round
Fish farming (dragon fish) and shrimp farming	Year round
Livestock and poultry production	Year round
Small businesses	Year round

* Taros grow from February to May during the dry season every year.
** For traditional handicrafts.
Source: Primary data gathered from local households at the Dai An commune, 2014.

Water management. The number of people with access to clean water and toilets were the lowest compared to other subdistricts in the province. Water salinisation was seen in the area, and saltwater intrusion varied with the amount of water flowing from the Mekong River – saltwater intrusion was deeper and further inland when water flow from the rivers was less. Water pollution is caused by many sources, including natural causes, fish and shrimp farming activities, pesticide and fertiliser use for rice farming, and domestic activities.

The dyke system that covers the protected area (road and sluice gates are part of SMTS, which is one of four big water projects on the Mekong) was built and developed by the government and international donors. People plant rice two times a year, as the crop remains unaffected by saltwater intrusion from the canals and rivers outside of the project. Because the sluice gates remain closed for many months every year to prevent saltwater intrusion from the sea, water for the local community's livelihood activities is transferred and redirected from upstream sources of the Tien River north of the province, flowing through many other communities before arriving at Dai An. As in Tan Ho Co, the unprotected area in some parts of Dai An was open land, so that saltwater intrusion from the rivers and canals during the

[6] Commune People's Committee's Dai An Commune statistics, 2013. Annual Year of the Paper Document Report. Dai An Commune Government Printing Office, pp. 7-10

dry season was common. In these areas, the local community planted one rice crop in a year and let land free for the rest of the year. A few households were engaged in fish and shrimp farming.

Methodology

The present research used in-depth qualitative interviews as well as secondary data collected from local commune authorities in the upstream and downstream sites selected. Two hamlets of the commune's four were taken to be representative of the entire commune for both the upstream (Dinh Ba and Chien Thang hamlets) and downstream (Tra Kha and Cay Da hamlets) study sites and selected for inclusion in the study to maximise differences among the communes in terms of water availability and other water-related issues. Exactly 39 households were selected purposively using a stratified sampling frame from studies sites both upstream as 10 samples to Dinh Ba hamlet, 7 samples to Chien Thang hamlet and downstream as 12 samples to Tra Kha hamlet and 10 samples to Cay Da hamlet to include both Kinh and Khmer ethnic minority households as well as households from the lower and middle/upper classes (Table 3). From each household, one working-age man and one working-age woman (e.g., husband and wife) were interviewed. Villager interviews included open-ended questions on the main research objectives as well as a short socioeconomic and demographic background section towards the end.

Table 3: Interview schedule for the study sites.

Community/ hamlet	**Khmer households**		**Non-Khmer households**		**Total**
	Lower class	**Middle and upper classes**	**Lower class**	**Middle and upper classes**	
Upstream sites					
Dinh Ba	2	0	4	4	10
Chien Thang	1	0	3	3	7
Downstream sites					
Tra Kha	5	3	2	2	12
Cay Da	5	3	1	1	10
Total	13	6	10	10	39

Additionally, the following individuals were interviewed as multi-stakeholders: local government and department offices (09 from Tra Vinh Province: 02 from local authority; 02 from the commune and 05 from departments and 10 from Dong Thap Province: 04 from local authority; 02 from commune and 04 from department offices), experts from national and international as 03 from Universities; 01 from Academic Institute and 01 from Freelancer (see list of interviewees in Appendix 2). The inclusion of various actors related to water management in the commune strengthened the study's data quality. Secondary data were employed for ascertaining information on the background of participants.

Both men and women were interviewed in each family, four hamlets were interviewed in total and the number of respondents in each hamlet was different. As the hamlets from the upstream site did not have many Khmer ethnic group members, only a few were interviewed. As the two downstream hamlets had many Khmer

ethnic group members, respondents were mainly Khmer residents in this area. Totally, 39 households (or, 78 respondents, both men and women) were interviewed separately (Table 4).

Table 4: Study sample size.

Stakeholders	Nunmber of respondents	Notes
Experts from national and international	5	
Local government: Commune People's Committee and local authority	19	
Local households in Dong Thap province	17	34 respondents
Local households in Tra Vinh province	22	44 respondents

Source: Primary data gathered from local households, 2014.

Technical study

Each interview lasted about 60–90 minutes.

A consent form was used to obtain the respondents' permission to use information, such as personal details and their responses to private questions, as well as to record the interviews (see Appendix 4). The interview was conducted only after both the researcher and respondent had signed the consent forms. Each party received a copy of the form.

Following a short introduction on the socioeconomic status of households after the interview, personal information (such as, number of rooms in the house, house roof material, material of the house, resources of drinking water, etc.) was sought to ascertain how realistic their valuation of property at home was and to understand their current backgrounds (see Appendix 3 for full questionnaire).

Literature Review

Presented below is a brief overview of a few studies from Southeast Asia that have analysed the influence of gender, class and ethnicity as factors in relation to water resources.

Access to clean water in the peri-urban areas of Can Tho City

Reis focused on how different classes in the community in peri-urban areas of Can Tho City accessed clean water for use and whether piped water schemes were of value to local people.[7] For domestic water, sources of water for local communities were canals, rivers, and rain or piped water. Reis concluded that the piped water scheme to support the local community was inefficient, as some local residents continued to access water from the rivers and canals or used rainwater. The study presented stronger evidence as tables and diagrams.

Reis mentions, '… it is difficult to assess how many people have access to clean water, because the available data shows substantially different results … partly due to the application of a variety of definitions about what access to clean water

[7] Reis (2011). Access to clean water in the peri-urban areas of Can Tho City. Centre for Development Research (ZEF) Social Science Brieft on the Mekong Delta. Wisdom- A German and Vietnam Initiative

means'.[8] Assuming that tap, well and rainwater are usually safe for drinking, cooking and personal hygiene, it was estimated that year-round access to clean water was problematic for 30 per cent to 50 per cent of the population in peri-urban areas of Can Tho City.

Gender and caste spaces in household water use: A case of Aliabad village in peri-urban Hyderabad, India

Prakash and Singh focused on a village in peri-urban India and explored how men, women and different castes/classes in the community accessed clean water for domestic use.[9] The dimensions assessed and identified included gender, class and ethnicity in the peri-urban community. Water was sourced from piped water stations and the local community had access to local government offices. Based on statistical data on the socioeconomic conditions and water problems at the research sites, surveys and in-depth interviews were conducted to understand, identify and explore water-related issues in the local community. The authors used figures and tables to present data on water sources for domestic use, women's roles in collecting water, the perceptions of men and women, and the reasons for inadequate water supply, among other variables. In this study, gender and caste needed data disaggregated analysis, so that gender and class could become a component of water policy.

Water was used for four main purposes, including drinking, cooking, washing and bathing. There were four different sources of water, primary and secondary, for the local community: wells, groundwater, bottled water, and 'do not source' or 'can't say source'. Women collected more water than men. The authors found that there was a dearth of studies that had conducted disaggregated analyses on gender and caste in India, as well as a need for more such studies. New reforms were found to be necessary for gender and caste spaces with regard to household water in India, so that men and women, and people from the rich, middle and upper income groups could have more access to clean water for daily living purposes.

Gender and ethnicity in household decision-making: Evidence from rural Nepal

Devkota, Rauniyar and Parker found that gender disparity in household decision-making, which was common in developing countries, was influenced by factors such as ethnicity, culture and geographic location.[10] According to the study, gender roles from different groups were integrated and participatory and, unlike popular perception, women's involvement in economic activities was quite high. Men and women decided together on matters related to the allocation of family labour, but there was variation among the ethnic groups. Women were more involved in household management and family well-being related activities than men in all ethnic groups.

[8] Ibid

[9] Anjal Prakash and Sreoshi Singh, 'Gendered and caste spaces in household water use: A case of Aliabad village in peri-urban Hyderabad, India' (Peri Urban Water Security Discussion Paper Series, Paper No. 5, Secunderabad: SaciWATERs, 2012).

[10] Durga Devkota, Ganesh P. Rauniyar and W. J. Parker, 'The role of gender and ethnicity in household decision-making: Evidence from rural Nepal' (paper presented at the 43th Conference Australian Agricultural and Resource Economics Society, Christchurch, 20–22 January 1999).

Gender participation in water management: Issues and illustrations from water users associations in South Asia

The study investigated water use in projects that transferred water from the state to communities for their livelihood activities[11]. Gender participation in decision-making processes at various stages of the project was found to be varied, with women's participation in water users' organisation minimal, so much so that formal and informal membership criteria for these organisations usually tended to exclude women.

Gender participation in hygienic latrine building: A case study from the Mekong Delta in Vietnam

Toilet-building projects for poor and near-poor families, funded by East Meets West Foundation (EMW), Vietnam, in a rural area of the Mekong Delta were assessed. Dang found that consensus was arrived at by discussions among men and women before building hygienic latrines in houses.[12] Women's participation in public meetings was higher than men, as men usually worked in farms or had other jobs in the community. Women obtained more information about the toilet-building programme while men had more right to decide on the actual toilet-building exercise as a final step in the decision-making process.

Gender issues and women's participation in irrigated agriculture: The case of two private canals in Carchi, Ecuador

The study, which analysed the importance of women in integrated agriculture, sought to understand the factors that influenced the involvement of Mestizo women in irrigated agriculture in two private-sector canals in Carchi, Ecuador[13]. Although women participated less in the private-sector initiatives at the study sites, at the household level and especially in female-headed households, their participation was high. In households with small children, women's participation in agriculture was limited due to family obligations. In households where old couples lived by themselves, women were either too old or too sick to be as involved as earlier in agricultural activities. In households that had no small children, women preferred to engage in other activities where they could control their income. Women with a rural background were more likely to participate in agriculture than those from an urban setting.

Decision-making Processes in Vietnam

Decision-making processes with regard to water infrastructure, including clean water and irrigation projects, as well as consultations in the bottom-up and top-down approaches adopted at the two sites were considered and reviewed. Four hamlets, two from each province, were included in the study.

[11] Durga Devkota, Ganesh P. Rauniyar and W. J. Parker, 'The role of gender and ethnicity in household decision-making: Evidence from rural Nepal' (paper presented at the 43th Conference Australian Agricultural and Resource Economics Society, Christchurch, 20–22 January 1999).
[12] Ly Quoc Dang, 'Gendered participation in hygiene latrine building: A case study in Binh Ninh commune, Cho Gao district, Tien Giang province, Vietnam's Mekong Delta' (Graduate thesis, Geneva: Graduate Institute, 2011).
[13] Elena P. Bastidas, 'Gender issues and women's participation in irrigated agriculture: The case of two private irrigation canals in Carchi, Ecuador' (Sri Lanka: Ecuador International Water Management Institute, 1999).

Bottom-up approach

A government meeting of the local authority (hamlet; *cấp Ấp*) was organised in the community in order to gather the opinions of local residents about projects. The leader of the hamlet (*Trưởng Ấp*), who was the facilitator of the meeting, made announcements regarding project planning in the community for all residents. Issues discussed were related to the community situations observed, perceived or examined by the leader or member of authority or by local residents in the community (hamlet). Participants were householders involved in the project who were invited by the leader. For instance, where a canal was being newly planned, or deepening and widening of an existing one being considered through a family's land, the landowner or affected family was invited to attend the meeting. The agenda for the meeting included announcements on project planning, obtaining consent/permission from affected households, consulting for opinions and comments, discussions on possible solutions, vote gathering from participants, and final decision-making. Any decision-making regarding a project had to have the approval and vote of the entire local community involved in the project. So, a representative of the entire local community in the meeting was asked to go through and vote in lieu of the entire local community based on the statements received from participants during the meeting and accordingly plan for the village.

The hamlet category of '*Ấp*' is the lowest level as per the national administrative structure system, in which there are only three main factors – party and authority (i.e., the Ấp's head and leader), civil society organisations (i.e., women, youth and other unions), and police and military stations (which are in turn controlled by the party and authority). The water issues covered in the meeting included clean water supply and sanitation projects, the improvement of existing and development of new irrigation systems (such as, canals), which are usually managed and facilitated by the local authority and party members in the hamlet, with the local authority/member having to consult local community members regarding any new information and/or documents. Once statements were approved and votes taken in the form of signatures and fingerprints from all participants of the local community, the decision-making process was transferred to a higher level, that is, to the commune.

At the commune level (*Cấp Xã*), the Commune People's Committee (CPC) collates statements from all hamlets and submits them to the district level (*Cấp Huyện*) authorities. The statements are based on different kinds and sizes of local (*địa phương*) projects, which are categorised as levels 1–3. The communes keep local work for improvement projects in the community to themselves. For projects of levels 1–3, which are submitted to district-level authorities, the response is usually awaited. As Figure 3 shows, CPC is the strongest arena that can sign and decide to send statements to district-level authorities. For local projects undertaken at the commune level, financial contribution comes mainly from the local community, with small amounts from the CPC.

Figure 3: Leadership structure at the commune level.

Source: Primary data gathered from local households, 2014.

All statements from all communes in the district are collected at the district level, with the projects arranged according to kind and size in the district. Projects of levels 1 and 2 are referred to the provincial level (*Cấp Tỉnh*) by the district level, as the latter has the mandate of committee board members at the district level to sign and send such statements higher up; the district-level authorities retain level 3 projects, as they are responsible and capable of handling these. Usually, decisions on planned projects are considered once a year at the commune, district and provincial levels. Level 3 projects are taken care of by the committee, which implements them based on financial support received from the Office.

Each province is provided financial support by the top government through the national budget, with the budget allocation being different for each province and being based on respective social and environmental issues. Each province, which administers its budget allocation independently, can distribute its projects based on requirement and suggestions from lower-level authorities at the commune and district levels. What is more, decision-makers at the provincial level cannot approve all projects submitted by district-level authorities; instead, they choose an appreciatory project, with high priority accorded to the communities. Each district is allocated a small, individual budget by the provincial level that they can use for level 3 projects (such as, canals) instead of for projects of types 1 and 2. At the commune level, authorities can decide on projects, such as the local canal (*kênh nội đồng*), as they too receive a small annual budget allocation from the district level as well as contributions to this budget from the local community.

Top-down approach

Top-down approaches – which are controlled and managed by decision-makers and policymakers in the national government, and who are thus conversant with the country's future directions and strategic designs at both national and regional levels – were also being adopted for arriving at decisions regarding water resources at the study sites.

Findings

The present study explored water issues in upstream and downstream rural areas of the Mekong Delta in Vietnam vis-à-vis the lenses of gender, class and ethnicity. Rural women of almost all age groups were engaged in the collection of water for household (such as, domestic use) and livelihood purposes in the community, including water supply for livestock, from canals and rivers. Typically, they had to

walk some distance to bring water back home. Where neighbouring households had handpumps (*máy bơm tay*), women also approached neighbours for water. This was especially common among poor households. As a result, women tended to work for long hours. Daughters, who often helped mothers with household chores, were kept busy and less emphasis was given to matters related to their health, education and other social activities. In both study sites, there were many poor families and people belonging to the Khmer ethnic group. Being a rural area, women here were likely more disadvantaged than men. Although the role of women in government water schemes has been a subject of policy discourse, women's role in the two study sites has largely been reduced to water collection, with limited involvement in the actual decision-making processes.

Sources of water

Six sources of water were identified for local communities in the two study sites: (i) rivers and canals (natural sources); (ii) handpumps (underground water); (iii) water supply from government and private-sector projects; (iv) rain and reserve water; (v) bottled or boxed waters; and, (vi) reserve pond water (Table 5). According to the table, it can be seen that water sources from bottled or boxes and reserve pond water are preferred by women, while river/canal (natural source) is men user, others sources are indicated to both women and men factors. Local communities used water from these different sources for various purposes in their lives and for both domestic and livelihood activities.

Figure 4: The study sites selected in the Mekong Delta on the map of Vietnam.

Source: Ly Van Loi, 2014

Table 5: Water sources and use in upstream and downstream communities.

Water source	Purpose of use	Gender spaces	Users (class)
River/canal (natural)	Rice farming, vegetable farming, fish farming, cooking	Men preferred	Lower, middle and upper income groups
Handpump (underground water)	Vegetable farming, domestic use, drinking, cooking	Women and men preferred	Lower, middle and upper income groups
Water supply from government/private-sector projects	Domestic use, drinking, cooking	Women and men preferred	Lower/middle and upper income groups
Rain and reserve water	Domestic use, cooking, drinking	Women and men preferred	Lower income groups
Bottled or boxed water	Domestic use, drinking	Women preferred	Lower, middle and upper income groups
Reserve pond water	Vegetable farming, domestic use	Women preferred	Lower income groups

Source: Primary data gathered from local households, 2014.

The upstream and downstream study sites were quite far from each other (nearly 130 km apart; Figure 4), and therefore their sources of water were different. At the upstream Tan Ho Co, water was sourced mainly from the Tien River via small rivers and canals, and local people accessed clean water from government water supply pump stations. They also collected rainwater during the rainy season, used water from handpump stations or bought water (boxed and bottled) from the market for drinking and cooking purposes. At the downstream Dai An, the local community accessed water sources much like in Tan Ho Co although water from the rivers and canals came from both the Hau and Tien rivers. Dai An, being located next to the sea, was affected by saltwater intrusion.

Gender-based division of labour

The proportion of working women and men and the division of labour between the two genders was found to be different for each household in the two communities. Productive and unproductive work was divisible as domestic and livelihood activities (Table 6). Women were significantly more involved in domestic activities, such as cooking and washing of clothes, when compared to men, although the difference in percentage narrowed for washing of clothes and carrying/pumping water. Men (90 per cent) were more involved in livelihood activities, including rice cultivation and small businesses, than women (10 per cent). However, women were more involved in poultry and livestock production than men. As the result, there was the similarity about gender-based division of labor in Tan Ho Co Commune of upstream and Dai An Commune of downstream from study sites.

Table 6: Gender-based division of labour in the upstream and downstream communities.

Main livelihood activity	**Men** %	**Women** %
Domestic activities		
Cooking	20	80
Washing clothes	20	80
Washing materials	30	70
Fetching or pumping water	40	60
Livelihood activities		
Rice farming activities	90	10
Poultry and livestock production	30	70
Small businesses	90	10

Source: Primary data gathered from local households, 2014.

Declining water resources in both communities

Water resources in both upstream and downstream communities had significantly declined both qualitatively and quantitatively in recent times due to over exploitation by users, and local communities faced the problem of water pollution. For the upstream local community in Tan Ho Co, water pollution was of various kinds and due to different sources – agricultural activities (including rice and vegetable farms, and aquaculture farm [such as, fish farm at Cá Tra]), human activities (household activities, with no treatment of wastewater prior to release into the water bodies[14]), husbandry activities (such as, livestock production of ducks, hen, cows and buffaloes) and poor personal hygiene (such as, use of unhygienic latrines) were all contributors to water pollution. For the downstream local community in Dai An, water pollution was similarly of various kinds and caused by different sources although the sources were slightly different – agricultural activities (including rice and vegetable farms), aquaculture activities (such as, shrimp and fish farms), human activities (household activities, with no treatment of wastewater), husbandry activities (such as, livestock production of hen, ducks, cows and buffaloes), and due to poor personal hygiene (such as, use of unhygienic latrines) were the main sources of water pollution.

In the upstream site, fish farms were run by companies and rich families who were either local or from outside communities. Water for use for fish farms was sourced from rivers, canals and underground water. As groundwater is drilled at fish farms and wastewater discarded into the rivers and canals without treatment month after month, the local community is affected by the consequent water pollution. Over the years, with the local government not paying attention to the problem, water quality has become seriously affected, so that the local community, which is primarily poor, has no access to clean water. Water pollution from fish farming has affected even other activities in the local community, such as rice farms, vegetable farms, livestock production and other farms. It was noted that between 2012 and 2014, the colour of

[14] Wastewater after use was released into the natural environment (such as rivers, canals, ponds, holes, and/or even the land behind or in front of their houses) with no treatment whatsoever, which worsened water quality further.

water in the rivers and canals had changed from its natural shade to green and subsequently to a darker shade near the big farms.

Agricultural activities were another source of water pollution in the upstream site. The main livelihood being rice production, 80 per cent of rice farms covered the community, 80 per cent of rice farms cultivated three rice crops a year, and 20 per cent of rice land cultivated two rice crops a year, as these were not protected by the dyke and therefore remained exposed during the flooding season. The use of pesticides and fertilisers, which are being produced with increased potency nowadays, was profuse on these rice farms. Water for rice cultivation was pumped from the canals and rivers, and then discharged back into these very water bodies after use (usually five times a season) without treatment, thus compounding the already existing problem of water pollution. Other activities also contributed to the pollution of water in the natural environment.

Meanwhile, at the downstream site, the quality of water has worsened overwhelmingly for many reasons. Aquaculture activities were extremely affected by the declining quality and quantity of water. Shrimp and fish farming in the community were critically examined. Shrimp farms obtain saltwater from the sea, which is allowed to flow into the rivers first to reduce salinity prior to use. People involved in shrimp farming belong to the high or middle classes in the local community or hail from other communities in the district and province. Water for use in these farms is pumped to the farm and then transported outside the farm for changing every season, thus affecting water in the natural environment.

With fish prices increasing in the market, the number of households involved in fish farming has increased rapidly.[15] For fish farming (*cá lóc*) in the local community, the sources of water are freshwater from canals and rivers, as well as underground water. Each household uses a handpump for drawing underground water. Similar to the upstream site, wastewater is discarded into ponds and the natural environment (rivers and canals) without treatment. Alternatively, farmers may fill the pond with underground water using handpumps. Local people and other activities have been affected overwhelmingly in the community, as natural water sources have become unusable. Poor sanitation due to bad odour, aesthetic pollution and health impacts are but a few of the effects of water pollution evident in the community.

Mr Thach So Phanh, vice-leader of the Office of Agriculture and Rural Development in Tra Cu district, Tra Vinh province, noted:

> The farm practice is no settling pond, so the sediment on the pond are usually slug slippery sludge out of the river, this kind of livelihood is almost spontaneous, rich households are raising snakehead fish, poor families are workers for them.

Others activities, such as agriculture and vegetable farming, have also been affected by the water pollution caused by farmers from the community using pesticides and fertilisers in rice farms although this is trivial as a cause of water pollution when compared to aquaculture. Other sources, including human activities, personal hygiene practices, and livestock and business activities, also contribute to water pollution by discharging wastewater without treatment, thereby aggravating water pollution in the community.

[15] According to commune statistics, 50 families, covering 5 hectares in the community, were engaged in fish farming.

Women: Less involved, but bigger users

According to 78 women respondents from the upstream and downstream communities, women took responsibility for household chores as well as livelihood activities and were therefore more prone to use water than men at home. However, this did not translate to mean that they were better than men when it comes to water use. Indeed, in case of lack of water, water scarcity and water pollution, women were disadvantaged with regard to obtaining and using water as an insider and outsider in their homes and communities.

Dr Dang Kieu Nhan, an expert from Can Tho University, suggested that:

> Women is not only working for their houses, but they are also working for others farms to find more money for their family. But the water is polluted every where, they have to put their body into the water many hours per day, their skin is affected by poor water quality and it gets sick. In addition, women take the bath on the river, so their risks for getting sick is high.

Women tend to access water for seven main activities in their home, including cooking, bathing, washing, taking care of children, livestock production, livelihood activities (rice farming and aquaculture) and doing business. Meanwhile, male family members accessed water for four activities, including bathing, cooking, livestock production and livelihood activities (rice farming and aquaculture). With the general decline in the quality and quantity of water in the community, women, who were more exposed to water than men, were more at risk for health and skin problems as well as other intestinal diseases.

All members related to a project were invited to attend the public meeting, called for consultation purposes at the local authority office, by either letter of invitation from the leader of the community or by oral communication. Letters were usually addressed to men who were the heads of households – Mr (*Ông* in Vietnamese) – and, in case the household head was a widow, to women – Mrs (*Bà* in Vietnamese). The number of participants was lesser than the number of invites sent, as some community members were working in the fields or houses at the time of the meeting. Women participated more than men (for instance, in Chien Thang hamlet, 70 per cent of women participated in the meetings while, in Tra Kha hamlet, participation among women was 65 per cent), but did not take any action, raise questions or give opinions.

Poor and ethnic groups most disadvantaged in accessing water resources for domestic and livelihood purposes

National and provincial governments have many policies for the poor and various ethnic groups, as they are financially less strong and have less capacity than other groups; clean water is a target for poverty reduction.

About 5 per cent of members of the upstream community and 90 per cent from the downstream community belonged to the Khmer ethnic group. These households were largely poor, with less access to water than others from the middle and upper classes or members belonging to the major group, which was Kinh in these communities.

The practice of selling land (albeit at a high price) in order to buy another piece of land (at cheaper prices) is common in rural areas, especially among the Khmer ethnic and poor groups. However, cheaper land was often available only in remote

areas with no roads and mostly unconnected to the town centres. This was also the case at the upstream and downstream communities studied here. For instance, in the upstream site, policies in place (*chính sách kêu gọi*) encourage local people to move to border areas (e.g., with Cambodia) that are remote and far from towns (and, consequently, from facilities, such as markets, etc.). For the downstream community, poor groups belonged to the Khmer ethnic group, whose houses were similarly in remote areas (and therefore far from clean water pump stations, etc.). Even where poor households lived in towns, they often sold land and moved to remote areas to save money and meet expenses. In such cases, local households in border areas do not have access to clean water in spite of assurances from local government offices that they are entitled to such amenities and there are policies in place to ensure that these facilities are developed. There are also no plans for irrigation systems to remote areas and so inadequate access to water for livelihood activities is a problem for many.

Community members who were rich or from the high classes were at an advantage when compared to poor people in relation to clean water, hygienic latrines, landowner area, seats on authorities of hamlets and communes, education and livelihood status.

According to Mrs Binh, senior officer from Care International Organisation, 'To the local people (farmers) of water management, the factors which were affected mostly are unprotected themselves including children, elders, women and poor people'. In this case, poor people constitute the vulnerable unprotected factor that needs better representation in the management of the local community. According to Mr Sung, a poor man from the Dinh Ba hamlet who sources water from the Cay Duong canal,

> The water from the canal is polluted, many things inside the canal, and the wastewater from the rice field also flows to the canal directly, including pesticides, fertiliser, and so on, we also use the water even though the quality is poor.

Mrs Mau, Mr Sung's wife, opined

> Normally, the water in this canal is turbid in the sunny season, but this season is more cleaner than past time. In the sunny season, the level of water on the canal is decreased and it is difficult to pump by small machine from our house, the colour of the water also changes from this season to another season because of amount of water sources, wastewater from aquaculture farm and rice field are flowing every day, but we still can use.

Indeed, water in the Cay Duong canal was polluted by wastewater from the rice fields and aquaculture farms in the community, which mostly belonged to the local rich people.

Mr Tran Huu Phuoc from the Chien Thang hamlet authority said,

> According to water, only poor people talk a lot, the rich ones do not say anything because they have money, they just make decision. They have voice and pay more attention to management board in the community in preparing seed for rice field because the rich households have more land in the farmland. The rich people make decision by phone call and they are not participating in any meeting, the board management has to listen them as they have big land in the farmland.

This suggests that, although the poor participate more in meetings, they do not have much say in its proceedings or outcomes. Farming schedules (such as that for community who hold larger land parcels and therefore greater sway over community decisions.

Borders within the region: Need for commitment from all stakeholders/users

The upstream and downstream study sites in the Mekong Delta were nearly 120 km apart, with the upstream Dong Thap province bordering with Cambodia while the downstream Tra Vinh province was located by the sea. The two communities differed considerably with respect to water resources in terms of water flow, quality and quantity of water, local aspects and policies on managing water, and water allocation among users depending on the kind of livelihoods, groups and geographical location.

There was no connection or cooperation among the various stakeholders (or, water users) in the region (both in the Mekong Delta and among Mekong region countries). Development projects for upstream sites in the Mekong Delta are not undertaken following community consultations with people from downstream areas although local communities in downstream areas are concerned about the development and planning of upstream projects.

Mr Thach So Phanh in Tra Vinh province observed

> Growing domestic demand, especially freshwater resources for production, their goal is to use too much, especially for industry. For example, freshwater for cooling of Duyen Hai coal-fired power plants in coastal, so the water in time to be serious scarcity. Therefore, we need to dredge a deeper channel for more freshwater to the people. As for clean water, it should invest in water supply to serve households.

Planning of projects upstream can affect the flow and quantity of water for local communities. For downstream communities, water flowing from upstream sources could help to control saltwater intrusion, so that local people could engage in rice and vegetable cultivation, etc. in the downstream areas. However, although many water policies and laws exist at the level of the national government, these are not put into practice at the local level due to a variety of reasons, such as inappropriateness, a lack of understanding of decrees issued by the local government, weak implementation of the decree in the local community, inability of local government officers to enforce them and/or rightly understand them, as well as a dearth of local water policies that can be developed from national policies for both communities.

Transformation among provinces in the Mekong Delta and other countries in the Mekong region is important with regard to water-related policies and frameworks. Regional water policies that could be translated successfully for the entire Mekong region were few and ineffective with respect to other countries; national water policies, in general, were unspecific with respect to the Mekong Delta.

Discussion

Issues related to water resources at two sites in the Mekong Delta in Vietnam were studied to assess the role of gender, ethnicity and class in water management at the local level. Water as a resource was becoming scarce for both communities and water pollution from various sources was evident at both sites – fish farming and agriculture were key contributors to pollution in the upstream site while, for the downstream site, the main polluters were fish farming and aquaculture.

Men and women in the communities did not participate in water management in the same manner or capacity. The participation of men was higher than women when engaging with senior officers and airing opinions during meetings. Women were not actively concerned with issues of water management and tended to be passive participants in meetings. At the household level, there was division of labour between men and women, which was different for each family. Men and women were involved variously in both domestic and livelihood activities when it came to water use. Women, who were more exposed to water, were more affected by its declining quality and quantity.

Language was a barrier to effective communication, especially for members belonging to the Khmer ethnic group. Being poor, they were also less likely to attend meetings, have access to clean water or information on water issues in the community, as well as remain engaged with local government offices.

According to class, the local community could be divided as poor, middle income and rich people. The poor were more disadvantaged when compared to the middle and high classes, as they were less likely to participate in meetings and engage with decision-makers. Rich people wielded more power in the community's decision-making processes. This has given rise to a trust deficit among poor people towards local government officers as well as reluctance on their part to attend meetings.

Water, which was used at the local level for domestic and economic purposes, was mainly sourced from rivers, canals, underground water sources (shallow and deep) and rainwater.

The decision-making processes for water management were made by the CPC, which gathered letters and collated suggestions, requirements and discussions at the local level before sending it successively up to the hamlet, commune, district and provincial levels. This bottom-up approach was similar to that used by all communes in Vietnam. In addition, a top-down approach involving policymakers with knowledge and experience regarding national and regional policies and plans was also being adopted.

There was no coordination between policies related to water among the various regions in the Mekong Delta and other Mekong countries. There was also a lack of appropriate water policies at the national, provincial and local levels. Transformation with regard to water-related policies and frameworks in Vietnam's many provinces in the Mekong Delta as well as other countries in the Mekong region will go a long way in the social integration of populations living in remote areas.

Appendices

Appendix 1: Field photos.

Figure 4.1: Author interviewing Khmer women in Dong Thap province.

Credit: Huynh Quoc Thai, 2014.

Figure 4.2: Main crop in Tra Vinh province, with underground water as water source.

Credit: Ly Quoc Dang, 2014.

Figure 4.3: Canal supplying rice fields, the main livelihood activity, in Tra Vinh province.

Credit: Ly Quoc Dang, 2014.

Figure 4.4: Water collected for daily use in Tan Ho Co commune in Dong Thap province.

Credit: Ly Quoc Dang, November 2013.

Figure 4.5: Electric water pump used for pumping water from the rivers, canals and wells in Tan Ho Co commune in Dong Thap province.

Credit: Ly Quoc Dang, October 2013.

Figure 4.6: Storage of river water in Tan Ho Co commune in Dong Thap province.

Credit: Ly Quoc Dang, October 2013.