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Rules of Distributary Engagement: Cultural Adaptation and Digital Enhancement of Hydro-ecological Decision-making in the Mekong Delta, Việt Nam

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**RULES OF DISTRIBUTARY ENGAGEMENT: CULTURAL ADAPTATION AND
DIGITAL ENHANCEMENT OF HYDRO-ECOLOGICAL DECISION-MAKING IN THE
MEKONG DELTA, VIỆT NAM**

A Thesis

Submitted to the Graduate Faculty of the
Louisiana State University and
Agricultural and Mechanical College
in partial fulfillment of the
requirements for the degree of
Master of Landscape Architecture

in

The School of Landscape Architecture

by
Clare-Mai Hoang Nguyen
B.S., Bellarmine University, 2009
May 2019

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Abstract

Focused on current initiatives for climate resilience, this paper explores a culturally adaptive approach to participatory planning in the Vietnamese Mekong Delta. It details key engagement components to accompany the use of *Tangible Landscape*, an interactive, data-driven modeling platform, in a series of workshops sponsored by the World Bank. Innovations like *Tangible Landscape* hold the potential to significantly increase stakeholders' accessibility to scientific data and scenario models. To what extent do the specificity of place and culture determine the efficacy of these tools in democratizing decision-making?

This paper delves into Việt Nam's socioeconomic development through Mekong agriculture, as well as its history of colonization, disempowerment, war, and perseverance, as background to the complex identity, political climate and mounting environmental precarity of the delta. Hydro-ecological issues and interventions are framed in a human context, informed by research on art, visual communication, and media strategies utilized by government, citizen, and international groups. With an awareness that current power structures and foreign aid/intervention complicate citizens' perception of security and self-determination, the goal of proposing a combined technological and arts-based approach to participatory planning is to maximize the inclusion of those whose lives are most closely tied to the changing environment.

Chapter I. Introduction

The people of the Vietnamese Mekong Delta are facing social, economic, and environmental threats due to a number of natural and anthropogenic changes, including urban development, intensified agricultural production, increased flooding, and extreme weather.¹ These global issues are exacerbated in the context of a country with a complex, traumatic, yet determined history that includes colonization, migration, and war; combined with the current reality of a one-party government that directs provincial authorities and other agencies, and the effects that both they and the environment have on livelihood opportunities. So, what is being done? What the initiatives? Who are the decision-makers? How are affected peoples made aware of these large-scale issues, and how are they able to cope with or overcome changes and problems locally?

Delta Issues & Initiatives

The delta is a hotspot for news, research, and intervention by other governments and organizations for a few main reasons: how important it is - and has been, for a long time - to the country's economy and food security; the increase in extreme weather conditions that is affecting agriculture and livelihoods: flooding, drought, etc.; and it is determined to be at very high risk to the effects of climate change, including sea-level rise, saline intrusion, erosion, increasing temperatures, the frequency and magnitude of extreme events, drier dry seasons, and wetter wet seasons.²

¹ IUCN and VAWR, 6.

² World Bank, Project Information Document P159976 (2017)

The causes of these changes are not just weather and climate-related, but influenced by land use change, development, and urbanization; over-exploitation of resources; unsustainable practices, pollution, etc.; lack of education regarding conservation among poor and rural populations, as a result of a subsistence culture under stress; and upstream controls by neighboring countries.

Recognizing how essential the Delta is to Việt Nam's socio-economic development and prosperity, both the Vietnamese government and IGO/NGOs have developed many reports, plans, and initiatives. Priorities include steps to modernize agriculture and use of natural assets, to enhance climate change resilience, and to strengthen institutional foundations. There are numerous other goals of the government, World Bank, and partner organizations, with associated proposed strategies and solutions. This brings up the question: How are all these studies, issues, plans, decisions disseminated and communicated to the international public, and more importantly, to the Vietnamese public?

World Bank Consultancy with Tangible Landscape

This research work originated and has been developed in partnership with a Louisiana State University faculty-led consultancy project, “Bringing Disruptive Technology to the Mekong Delta: Tangible Landscape,” which began in August 2018.

Tangible Landscape is a disruptive technology based on open-source elements that links a physical model with a geographic information system and 3D modeling platform through a real-time cycle of interaction, 3D scanning, geospatial computation, and 3D rendering. This 3D tool enables rapid design and scenarios testing for people with different backgrounds and computer knowledge, and support for decision-making. Modelled to specific contexts, technical specialists and researchers, as well as local government/agency counterparts, and communities

can collaboratively explore design alternatives in land and water use through an iterative process of intuitive ideation, geo-computational analysis, realistic rendering, and critical analysis.³

Consultancy by the Tangible Landscape team will leverage the existing engagements in the Mekong Delta by the World Bank and other development partners, toward three major goals: to 1) support regional planning and regional coordination, 2) enhance spatial analytics for climate-resilient investments, and 3) strengthen multi-stakeholder capacity for adapting [agriculture, aquaculture and horticulture] livelihoods. The 3D modeling platform will be adapted to scenarios in the delta, for use in a series of training workshops sponsored by the World Bank. The intention is for the platform to be further taught and distributed as a data-driven, yet approachably interactive, engagement tool for a greater number and diversity of stakeholders.

Rules of Distributary Engagement [Thesis Concept]

The focus of the author's participation and research for the consultancy is the development of "rules" for a culturally adaptive, technological approach to participatory planning in the Vietnamese Mekong Delta. Through cultural studies and explorations of tools of engagement, combined with the author's personal skillset and experiences, a combined digital and analog visual communication approach was established with the purpose of adding human dimension and accessibility to the display of scientific information (climate change adaptation), and providing means and empowerment toward understanding and greater participation.

This paper will begin with a literature review of multiple subjects related to initial project research, and additional topics whose relevance organically emerged:

³ Petrasova, et al. *Tangible Modeling with Open Source GIS*. Web: <https://tangible-landscape.github.io/>

Chapter II covers sources for historical and contemporary context to the delta and summaries from organizational reports to identify urgent environmental issues and trends, and current initiatives to address them.

Chapter III goes over current environmental decision-making structures in Việt Nam. Theory and argument for participatory planning (democratizing decision-making) follow, along with a summary of participatory planning case studies. From these case studies the author extracts tools for knowledge sharing, including interpretation of local knowledge, campaigns and advertisement, and interactive games and models. With these tools in mind, the chapter reviews cases of engagement located within the country of Việt Nam, Mekong region and delta, evaluating their efficacy/results, potential, and cultural implications.

Chapter IV explores in more detail these cultural implications, by looking at studies and interviews that involve the relationships of Vietnamese people with the environment, which combine a complex mix of religious, historical, social, subsistence and diasporic perspectives.

Chapter V and VI outline the author's chosen cultural visual communication approach, starting with a critical review of Vietnamese art history – from early history, mid-century propaganda, and wartime paintings – to contemporary art and media, then Vietnamese cartography; and describe how these components show (further) evidence of a specific cultural relationship with the environment (while in turn informing and influencing that relationship).

The project section of the paper, Chapters VII and IX, describe the concept development, process, and production of two visual works titled “Bản đồ lớn” (“The big map”) and “Cuốn sách nhỏ” (“The small book”). The idea behind creating the two pieces comes from a desire to tell both a larger, systems-scale narrative, and a smaller, personal narrative that together describe the coastal context and Mekong river and distributary system, issues occurring in the delta, and

local-scale interventions. Familiar objects of map and book inform each other and take on composite digital forms for project uses.

Personal familiarity with Vietnamese attitudes and familial customs - memories of hands-on self-sufficiency in building and gardening, food-centric communal interactions, and bright colors in religious and cultural events, interactions in Vietnamese immigrant communities, and more recent visits to communities in New Orleans have given the author a personal foundation from which to consider the above studies and methods. It also gives an individual development dimension to the project process, and commitment to the project proposal.

The paper concludes with a proposal for how these graphics may be adapted for use in project communications, to accompany the use of Tangible Landscape in workshops, and as distributable education and engagement materials.

Chapter II. Context

Historical and Contemporary Context

Việt Nam's socioeconomic development through Mekong agriculture, as well as its history of colonization, disempowerment, war, and perseverance, are relevant background to the complex identity, political climate and mounting environmental precarity of the delta. The author regrets the lack of confidence in accurately summarizing these complexities here but has included reliable historical sources in the bibliography. This paper will frame hydro-ecological issues and interventions in a human context, informed by research on art, visual communication, and media strategies utilized by government, citizen, and international groups. With an awareness that current power structures and foreign aid and intervention complicate citizens' perception of security and self-determination, the goal of proposing a combined technological and arts-based approach to participatory planning is to maximize the inclusion of those whose lives are most closely tied to the changing environment.

Delta Issues

"The rapid population growth since the end of the war, coupled with extreme poverty, has placed the environment under increasing strain." Both historical events and ongoing activities continue to impact the people and both urban and rural environments of the Mekong Delta. The causes of these changes are not just weather and climate-related, but influenced by land use change, development, and urbanization; over-exploitation of resources; unsustainable practices, pollution, etc.; lack of education regarding conservation among poor and rural populations, as a

result of a subsistence culture under stress; and upstream controls by neighboring countries. These transboundary influences are of major influence to the greater watershed, which empties through the delta. Recognizing how essential the Delta is to Việt Nam's socio-economic development and prosperity, both the Vietnamese government and IGO/NGOs have developed many reports, plans, and initiatives. Priorities include steps to modernize agriculture and use of natural assets, enhance climate change resilience, and strengthen institutional foundations.

Delta Initiatives

The main World Bank initiative that is tied to the *Tangible Landscape* consultancy and to this study is the “Mekong Delta Integrated Climate Resilience and Sustainable Livelihoods Project.” The sub-goal of this initiative relates to that of many others: to enhance stakeholder engagement. Innovations like *Tangible Landscape* hold the potential to significantly increase stakeholders' accessibility to scientific data and scenario models. With an awareness that current power structures and foreign aid and intervention complicate citizens' perception of security and self-determination, the goal of proposing a combined technological and arts-based approach to participatory planning is to maximize the inclusion of those whose lives are most closely tied to the changing environment. The combined goals of decision-making parties, from government to organizations to consultants such as *Tangible Landscape* are to foster more local engagement and develop tools that enhance existing ways that organizations engage stakeholders.



Figure 1. MD-ICRSL Field team focus group interviews with community.⁴

Field work conducted between 12 October and 15 November 2015, led by the International Union for Conservation of Nature (IUCN).

⁴ IUCN and VAWR. *Report on Regional Social Assessment...*

Chapter III. Engagement, Planning, Decisions

Decision-making in VN

Within the complex political framework described in the previous section, the decision-making framework is not any less complicated:

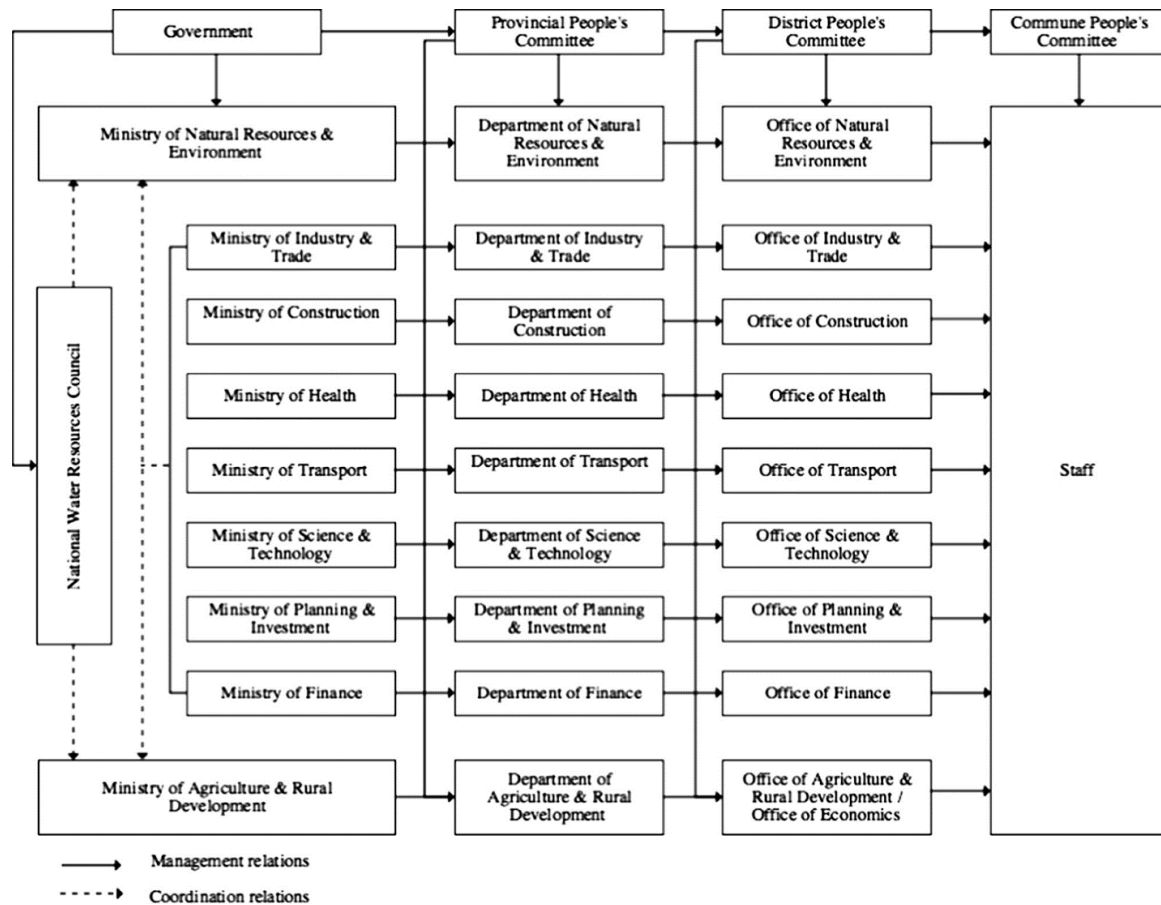


Figure 2. The institutional structure for water management in Việt Nam⁵

⁵ Ha, et al. "Governance Conditions..."

This is a separate system from the form and routes of information dissemination to the people. Where and at what point is citizen participation a part of the process? If at all? The author was interested in mapping existing engagement and information structures in Việt Nam by government agencies, unions, associations, communities of practice; and seeking out the agencies who are teaching sustainable practices and ways to be profitable. Issues with the existing Việt Nam Farmers Association mean independent farmers unions are also in demand.⁶ How can this situation be improved, based on participatory planning theory and precedents, international resources, and the social and political realities of Việt Nam?

Participatory Planning

Existing frameworks describe stakeholders' accessibility and the efficacy of visualizations in democratizing decision-making. This is particularly crucial in hydro-ecological decision-making: "the quality of governance pervades public decision making relating to policy formulation, resources allocation, legislation, rule enforcement and adjudication, making it the most important single influence on the shape and pace of institutional change in the water sector."⁷ Brown describes the relationship between political and scientific representation, and Hester, Galliard, and Steinitz propose input/output frameworks for design and engagement that incorporate local knowledge and input at multiple scales. In certain cases, external monitoring and study can shape local self-understandings and blur the line between "local" and "external" knowledges, especially when studies are based on relations, local experiences, and stories.⁸

⁶ <https://www.rfa.org/english/news/vietnam/social-commentators-say-vietnam-needs-independent-farmers-associations-05292015152649.html>

⁷ Floch, Philippe and David Blake. "Water Transfer Planning in Northeast Thailand: Rhetoric and Practice" in *Water Rights and Social Justice in the Mekong Region*. Chp. 2.

⁸ Rahder, "Caring for Xate, caring for Xateros: NGO monitoring, livelihoods, and plant-human relations in Uaxactún, Guatemala," 386.

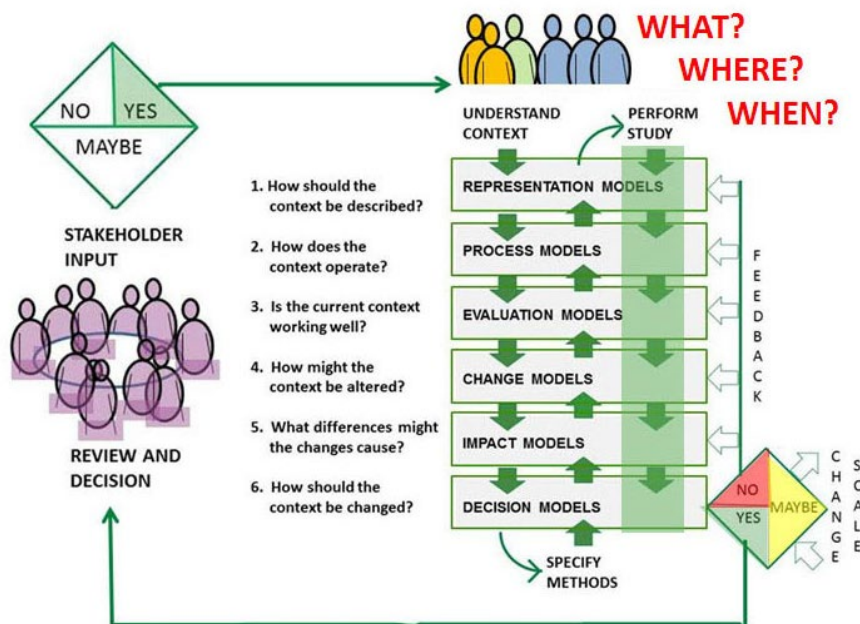
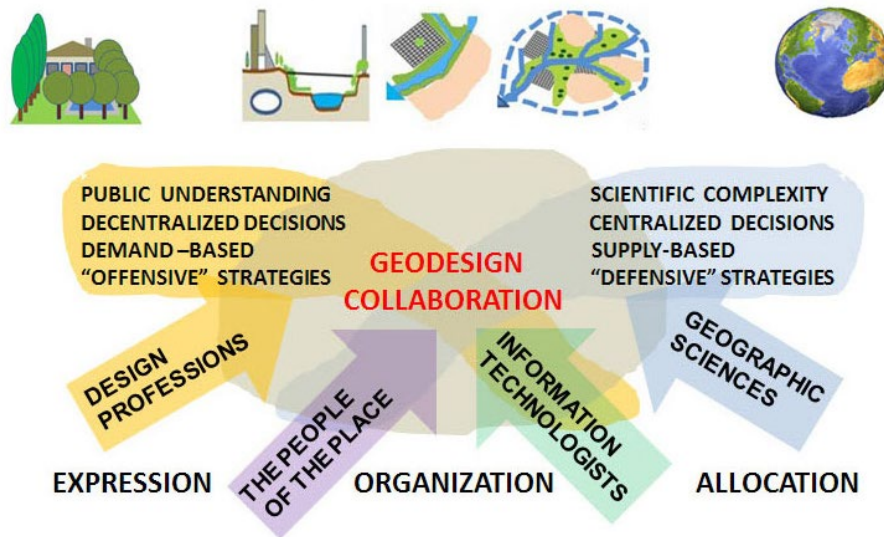


Figure 3. Geodesign collaboration and framework (third iteration)⁹

Geodesign is "a methodology that provides a design framework and supporting technology to leverage geographic information, resulting in designs that more closely follow natural systems."

⁹ Steinitz. Web: <http://geodesignwiki.com/tiki-index.php?page=Steinitz+Framework+for+Geodesign>

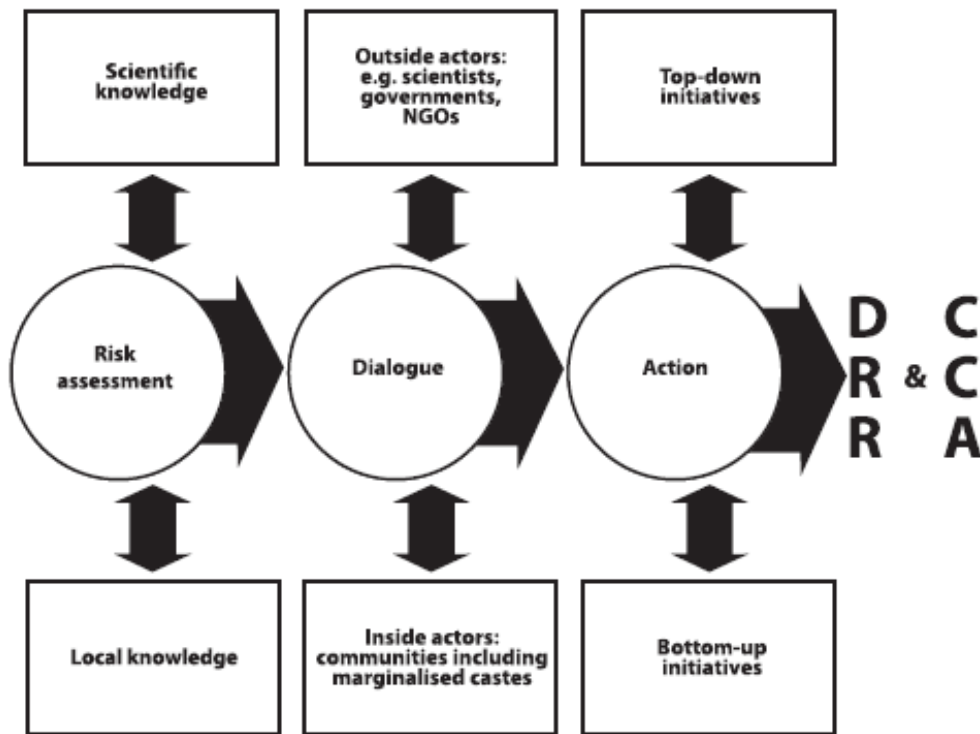


Figure 4. “Road map for disaster risk reduction and climate change adaptation”¹⁰

Galliard’s article reflects upon the use of participatory 3-dimensional mapping (P3DM) for facilitating the collaboration of different castes in disaster risk reduction (DRR) and climate change adaptation (CCA).

Participatory planning has significant potential to preserve or maintain social and political capital. One conclusion from a study of flood control and restoration projects is that as participatory planning requires some level of social and political capital, “it might function as a positive feedback process that maintains competences needed to confront future challenges.”¹¹ Trust building is essential to any planning process that seeks stakeholder engagement; it relies on connection-making, consistency, and effective communications by which to connect.

¹⁰ Galliard, et al., 159.

¹¹ Menzel, 13.

Methods and Tools for Sharing Knowledge

A review of tools for sharing and interpreting knowledge on local, regional, and global scales include valuating and interpreting local knowledge, visually communicating scientific information, and developing interactive models and games, such as Tangible Landscape and P3DM. Combined geographic and sociological approaches are valuable for interpreting “traditional ecological knowledge” of local stakeholders, as in coastal Louisiana.¹² In a workshop setting, as in one 2006 community mapping of ancestral territories among the Ogiek indigenous people of Kenya, the three dimensions of the model can effectively enhance the participatory aspect of a mapping exercise when local language and concept building are prioritized.¹³

Delta Case Studies

Case studies of engagement in the Vietnamese Mekong Delta, detailed in sociological and environmental articles, detail what people value and are concerned with; what tools have been used; what does or does not work; and other cultural and sociological insights. A combination of discussions, interviews, and surveys in three flood-prone areas in the delta revealed that social learning plays a significant role in facilitating the adoption and dissemination of experiential and experimental knowledge among farming households.¹⁴ Other studies looked at how residents evaluated conditions related to their environment and livelihoods, support for public investment projects such as groundwater treatment¹⁵, household vulnerability to natural

¹² Bethel, et al.

¹³ Rambaldi, et.al., “Through the Eyes of Hunter-Gatherers,” 124.

¹⁴ Tran, T. et al., “Social Learning through Rural Communities of Practice,” 31.

¹⁵ Vo, Danh Thanh and Khai Viet Huynh. "Estimating residents' willingness to pay for groundwater protection in the Vietnamese Mekong Delta." 421–431.

hazards¹⁶, use of mass media to influence pest management practices¹⁷, and social dynamics in shrimp farming decision-making.¹⁸ These studies encountered variability in perspective and values based on education, income, housing quality, land ownership, livelihood and crop diversity, access to communication tools, and more¹⁹, but there was an overall theme of social learning and learning that was most effective when directly applicable on an individual, family, or commune level. Examination of reports by local and grassroots organizations reveal various ways to conceptualize and talk about issues, including the example below which utilizes a non-technical illustration that, especially when paired with photos, does not lack in effectiveness as a communication tool when drawn and understood by participants.



Figure 5. “The Old River - The River Today” VRN Presentation drawings

Presentation drawings by the Vietnam Rivers Network²⁰

¹⁶ Tran, H. et al., “Household social vulnerability to natural hazards,” 489-503.

¹⁷ Heong, et al. "Use of communication media in changing rice farmers' pest management," 413-425.

¹⁸ Nguyen, Phuong, Romina Rodela, Roel Bosma, Arnold Bretg, and Arend Ligtenberg. "An Investigation of the Role of Social Dynamics in Conversion to Sustainable Integrated Mangrove-Shrimp Farming," 421–437.

¹⁹ Tran, H. et al., 501.

²⁰ Vietnam Rivers Network was established in November 2005, coordinated by the Center for Water Resources Conservation and Development (WARECOD). VRN is an open forum whose membership comprises a broad set of actors concerned with river protection and sustainable development in Vietnam, including NGO's representatives,

Chapter IV. Cultural Relationship with Environment

Having reviewed ways in which intervention and communications from government and outside agencies affect citizens' sense of empowerment in environmental decision-making, the author conducted further research to explore the question of Vietnamese self-understanding and relationship to the environment, and how a conceptual/symbolic/phenomenological visual approach might bridge these perceptions.

Experiences, Memories, and Values

Engagement on environmental issues depends not only on perception of empowerment, and ability to participate, but on cultural and personal values, memories, attachment, and experience of the environment.²¹ The aforementioned sociological case studies revealed a range of perceptions and quantified values by those who live and work in the delta. These do not fit the mold of “international”/western attitudes toward the natural environment.²² Because of the diversity *within* Việt Nam, especially within the Delta (where indigenous peoples of the Khmer empire were incorporated during the 18th century, and an additional portion of Cambodia in the 19th)²³, there is surely an array of different forms of Vietnamese self-understanding and environmental perspectives that exist simultaneously. Additional sources were sought to gain more insight and identify general key themes that may arise.

researchers, academics, government officials, local communities and individuals. Web:
<http://www.warecod.org.vn/en/thong-tin/about-us/52/394/Vietnam-Rivers-Network-VRN.aspx>

²¹ Also known as *cultural landscape*, which suggests that “nature is a domain experienced and produced by people and invested with cultural meaning and value.” Thomas, 3.

²² Thomas, 8.

²³ Goscha, *xx-xxii*.

Interviews with diaspora from Thomas' *Moving Landscapes* describe attitudes toward the land and water as productive, religious, visceral, and nostalgic:

"Vietnam is a highly populated, agricultural country, every piece of land is cultivated, the rice field is as natural as you can get. ... Everything in Vietnam has been changed by humans... You'll feel closer to nature [in Australia] than in Vietnam, but Vietnam will make you realise that humans can bring beauty to a piece of wasteland." -- Dieu-Linh, age 26.²⁴ "...[the river] was a source of life, never was it just an idle body of water, it carried with it business, families, irrigation." -- Thao, age 21.²⁵ "...in Vietnam, if we went for a walk in the country we always had a destination: a pagoda, or a temple or some other ancient or religious place." --Lan, aged 45

Visiting temples and other pilgrimage and historic sites is a common outing that is an important element to pilgrimage and outdoor leisure trips, and it an important part of Tết, the Vietnamese New Year.²⁶ These experiences of the landscape in Việt Nam show it to be imbued with cultural meaning, linked to legends and history, and as having religious significance.

Vietnamese relationship to landscape is also of subsistence: 85 percent of Vietnamese people live in rural areas and most of the city dwellers have relatives in the countryside who they frequently visit. In Việt Nam many people hunt, catch birds, fish, and grow fruit trees and vegetables. But to speak to survival: "Ha believes that Vietnamese people (usually more highly educated) who grew up in the city or central business part of a province would be more mindful of the environment compared to those who actually lived in the heart of the countryside. Ha believes that you can't really change the people in Vietnam, because no matter how educated

²⁴ Thomas, 44.

²⁵ Thomas, 44.

²⁶ Thomas, 62.

they are, if they are starving they have to find some way to live or eat, and in Vietnam this necessitates destruction."²⁷

In addition to journal studies and direct accounts recorded in literature, the author investigated cultural relationships with the environment in three areas that directly informed their graphic deliverable for future *Tangible Landscape* workshops in the Mekong Delta: studies of Vietnamese art and media, and the parsing out of thematic imagery and symbols; exploring parallel materiality between the Mekong Delta and coastal Louisiana; and synthesizing material, image, map and geospatial information through a combination of traditional and contemporary methods of representation.

²⁷ Thomas, 60.

Chapter V. Art Studies

In “Negotiating Memories of War: Arts in Vietnamese American Communities,” Yen Le Espiritu discusses the role of arts in collective remembering and in mediating one’s history and narrative: “As a medium that gives us a record of the culture of a period, arts can be a means of reclaiming the past by making present other memories that have been pushed to the margins.”²⁸ In the process of investigating cultural relationship with nature and environment, the purpose of studying Vietnamese art, past and present, is to find evidence tied to social and self-expression of peoples’ and artists’ worldviews. While some art was created under contract for political communications, as in the propaganda of the mid-20th century, others embody very personal and independent expression, seen in watercolor work by wartime artists, and contemporary pieces that are critical of politics. The author’s goal is to gain insight and identify themes through major historical periods and movements, parsing out imagery and symbols for resonance and relevance to the development of a vernacular visual communication strategy for present issues, as well as an engagement strategy by which people can represent themselves and express their own values and priorities.

²⁸ Espiritu, 198.

Traditional Techniques and Imagery

In traditional Vietnamese wood cut, the blocks were made from smooth hardwoods like persimmon and talauma. The paper was made from rhamneuron and glazed with powdered mother-of-pearl. Masters of this art resided in villages in the Red River Delta, who used prints – popular especially for New Year celebrations – to supplement their rice farming incomes between seasons. Favorite subjects included the divinities of the Holy Mothers’ cult and altar images used in ancestor worship; illustrations for New Year showed the seasons, farm work, historical events, and symbols of peace and prosperity (including children and buffalos) in bright colors that often also represented elements: yellow/Earth, red/Fire, green/Wood, white/Metal, and black/Water.²⁹



Figure 6. Traditional woodcut examples

²⁹ Noppe, 29, 256.

Mid-century Propaganda

Poster art in Việt Nam originated as protest art in the summer of 1945 as the momentum for independence from French colonial rule. Artists rallied to Ho Chi Minh's revolutionary cause, and the gold and crimson Viet Minh flag became an early icon. Posters were printed by hand from engraved woodblocks, and these thick line drawings added strength and originality. After 1954, the Democratic Republic of Vietnam (DRV) under Ho Chi Minh printed and distributed government newspapers and propaganda posters en masse, employing many illustrators. Socialist realism was introduced as "art for the people" and positive campaigns promoted post-war reconstruction, expansion of industrial and agricultural productivity, celebration of Party anniversaries, and the cooperation between workers, peasant, and soldiers, including ethnic minorities in colorful traditional dress.³⁰

Official posters and billboards still appear in Vietnamese cities, towns, and villages, designed by the state to campaign for things such as literacy, health family planning, and tax collection, and still to commemorate military victories and celebrate party anniversaries and ideals.

³⁰ Heather, 6-11.



Figure 7. Examples of agriculture and environmentally focused propaganda

Wartime Sketches and Watercolor

"There is an aesthetic in war. Because the events you are witnessing are too dreadful, it is up to the artist to use his art to re-affirm life and to communicate his belief in a better future" -

Pham Thanh Tam³¹

"I could only paint if I felt inspired... If I didn't feel a strong emotion, I wasn't able to paint. When I was drawing for a reason, to get a message across to an audience, that was propaganda. That's what you see in the propaganda posters." - Quach Phong.³²

Soldiers and artists traveled who traveled with soldiers during the Vietnam War, drew for military and underground newspaper and magazines, and for themselves as diaries, portraits of each other, of civilians, and of the landscape. Many had been taught in the style learned in French colonial art schools, which combined uniquely with traditional and propaganda art.

³¹ Buchanan, 205.

³² Buchanan, 34.

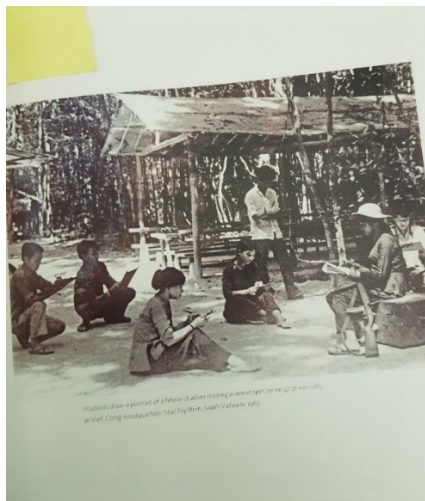


Figure 8. Painting on the frontlines

Scans from "Mekong Diaries"

Contemporary Art

Study of work by artists who live in Việt Nam, are from Việt Nam and moved, and have returned to Việt Nam show unique incorporations of traditional imagery and media while addressing modern conflicts and issues including rapid development and globalization.



Figure 9. Examples of Contemporary Vietnamese Art

*Works by Nguyen Dinh Vu, Hoang Thanh Phong, Dinh Q. Le, and Le Thanh Thu.*³³

³³ Ciclitira, 34, 73, 99, 136, 197.

Contemporary Media

Examples include advertising, PSAs, graphic design, and online platforms, including examples of online organizing and campaigns.



Figure 10. Save Our Trees Event³⁴

A group of Hanoians organized an environmental awareness event via social media.

³⁴ "Hanoians..." *FlashNotes* 3 (2015).

Chapter VI. Cartography in Việt Nam

“Two baskets of rice suspended on a yoke; such is the image most frequently cited by the Vietnamese to evoke the shape of their country as it appears on a map.”³⁵

Historical Cartography

The availability of maps to Western researchers is very limited. Among what is available are copies of maps from various dynasties that were produced for the purposes of survey (resource-control), itinerary (territory-control), and land records (village-control). They are internal in scope, and Chinese (Sinic) in their style, reflecting the cosmography and self-understanding of not just a country landscape, but a universe of mountains and water³⁶ (Fig. 11). Original maps from before the fifteenth century no longer exist, but have been redrawn at later times, and described in text to display a spiritual geography style, linked to spirit cults and sacred nodes and places.³⁷

³⁵ Noppe, 2.

³⁶ Whitmore states that "*Non nước* is one term the Vietnamese use for their country. It means quite simply "mountain and water" in Vietnamese (not Sino-Vietnamese), and this concept seems to underlie the Vietnamese visual approach to spatial representation" (479). The more common Vietnamese word for "country" is "đất nước," meaning "land" and "water," respectively, and is often shortened to "nước."

³⁷ Whitmore, 481.

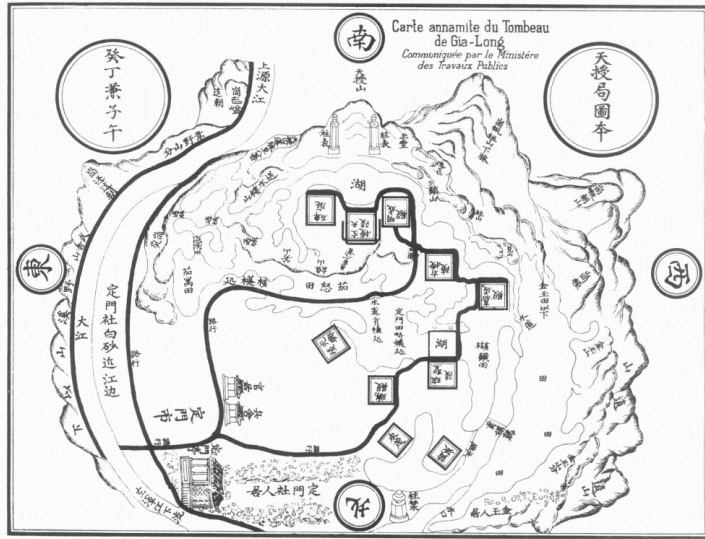


Figure 11. The Nguyen Tombs, Hue

A redrawing of the diagram of the Gia-long emperor's tomb, with a rare southern orientation, shows a cosmological mix of water and mountains. (Hanoi: Imprimerie d'Extreme-Orient, 1923).

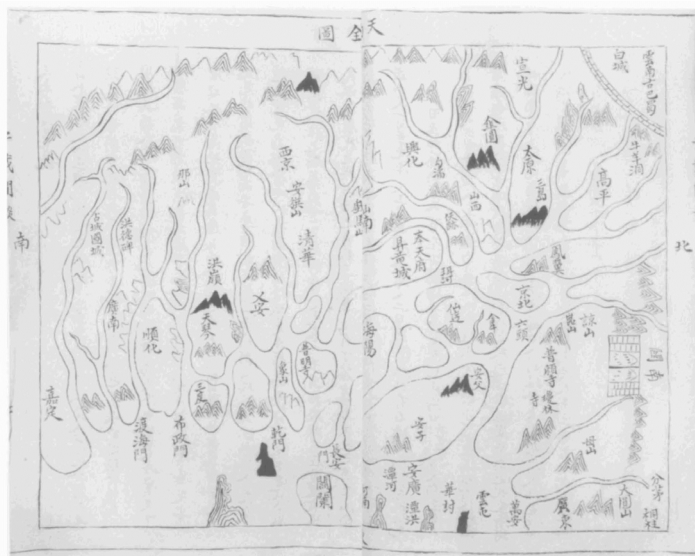


Figure 12. Map of the Country

1810 Nguyen copy of the late fifteenth-century map of Đại Việt showing the traditional northern view of the country and its limited concern for the extension to the south (west is at the top). Societe Asiatique, Paris (HM2125).

With the Le Dynasty and establishment of Đại Việt, maps became more important for the Vietnamese government when it adopted the Sinic bureaucratic model. While the Mekong Delta is not included in this extent, maps of the Red River Delta during the sixteenth century (Fig.) show a strong relation to the riverine and coastal environment, both spatial and human-made, featuring intertwining streams, canals, bridges, channels and estuaries, Buddhist temples, spirit cults, guard stations, and major historical sites and tombs.³⁸

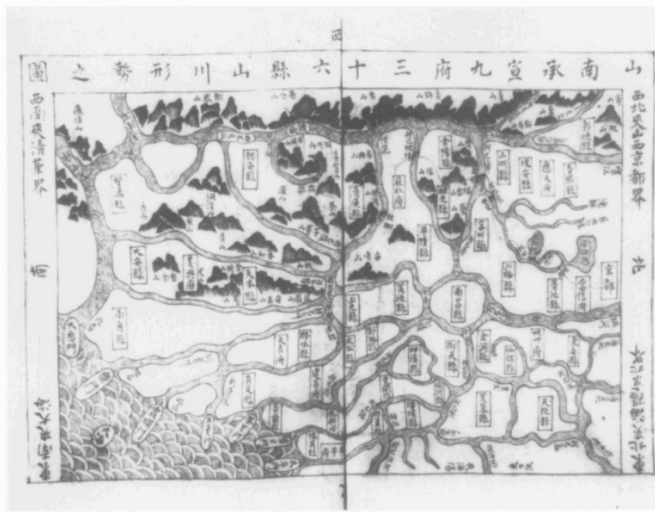


Figure 13. A province from the Le Atlas

This seventeenth-century copy of the late fifteenth-century map shows Son-nam Province in the southeastern portion of the Red River Delta (west is at the top).

The style of the Le Atlas lasted through multiple centuries, featuring only slightly modified representations of land and water through simple linework and exaggerated topography. By the nineteenth century, a better sense of the Mekong River system and its transboundary reaches into other countries (note: Tonle Sap lake) is achieved. European influence is noticeable, but the impressionistic Chinese style is maintained.

³⁸ Whitmore, 484.



Figure 14. Comprehensive Map of Vietnam's Provinces (Việt Nam toàn tỉnh dư đồ)

*19th century brush and ink manuscript map*³⁹

The brush and ink manuscript map from the 19th century combines traditional cartographic features practiced in both China and Việt Nam with Western elements. The place names and text block are in classical Chinese calligraphy, which was used by both Chinese and Vietnamese scholar-officials. Traditional elements include its pictorial style - mountains, trees, and structures such as the border gate, lack of precise scale, and emphasis on mountains and water – which are the most comprehensively labelled.

³⁹ *Comprehensive Map of Vietnam's Provinces*, 1890. Map: manuscript, color, 152 by 98 centimeters. Library of Congress. Accessed March 17, 2019. <https://www.wdl.org/en/item/226/>.

Contemporary Cartography

The six-decade French presence in colonial Indochina intensively carried out mapping for constructing railway lines and documenting flora and fauna. Mapping the course of the Vietnam War was also a strong preoccupation for the military during mid-century conflicts.



Figure 15. South Vietnam, 1965-68.

Australian combatants planning the next move, during Operation Duntroon.⁴⁰ and Captain Alan Thompson of the 1st Battalion, The Royal Australian Regiment, marking positions.⁴¹

This pressure and desire to know the land through this form of representation was not generally taken up by the populace in Việt Nam. In the study with Vietnamese diaspora about their attitudes toward landscape, interviewees express the lack of importance of maps to their daily

⁴⁰ <https://www.awm.gov.au/collection/C316625>

⁴¹ <https://www.awm.gov.au/collection/C309048>

lives when travelling through the country in Việt Nam: “One always travelled with family or friends, or on a well-known path.” Thomas’ conclusion from this and related responses is that the cultural experiences and social relations of places are more meaningful than perspectives and representation in which space is thought of as neutral and knowable.⁴²

The maps created by GIS datasets in the early stages of the World Bank consultancy are global by default. Data specific to Việt Nam’s hydro-ecological systems relatively difficult to come by. That Vietnamese cartography has historically been internal, and (exclusive) to a higher-level of decision makers, sparked the desire to reverse the act of scaling down from a satellite view and instead work from the ground up: using a personal, expressive, tactile, engaged, hand-made, phenomenological experience of material (subset of environment), and seeing how components of daily life, peace, struggle, work, subsistence, and adaptation may contribute and work *up* to a greater whole.

⁴² Thomas, 56.

Chapter VII. Project Part 1: Bản đồ lớn

Map Concept

Informed by studies of the historical and political uses of cartography in Việt Nam, and personal perceptions of country, the author sought a combination of map-making techniques that combines tangible, material experiences with geographic accuracy. The concept behind creating a woodcut print that depicts the Mekong River watershed and delta, based on regional GIS data, is to create a layered, systems-scale narrative, on a personal scale. This project component is as much about process as it is product, as the author utilizes traditional (ancestral) techniques combined with the digital mapping and printing tools of their current work in landscape architecture. This further speaks to the existence of a range of collective views of landscape – global, national, Western, ethnic, and so on – and how complex, unique, and diversely informed an individual person’s mapping may be of an accepted geographic area.

Mapping Delta Trends with GIS

Organizational reports have been a primary source for evaluating the conditions, predicted trends, and proposed solutions for the Vietnamese Mekong Delta. These solutions speak to a practical relationship with the environment, and are depicted on regional scales via satellite imagery, modeling, mapping, and diagramming. Over the past year, the Tangible Landscape team gathered GIS datasets from multiple sources such as Open Development

Mekong⁴³, the Joint Research Centre⁴⁴, Natural Earth⁴⁵, and others for MERIT and ALOS DEM and other data.

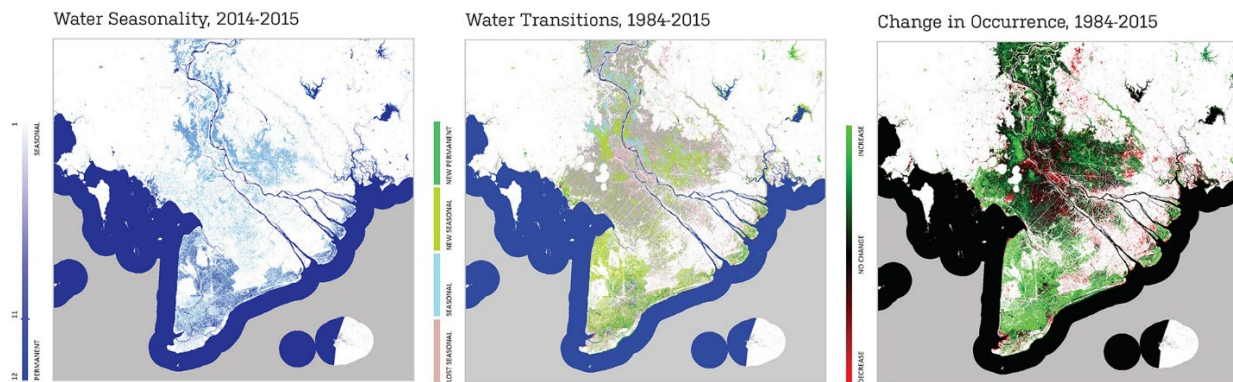


Figure 16. Global Surface Water data for the Mekong Delta⁴⁶

Data downloaded and adapted by author showing surface water “seasonality”: where water is present 0 to 12 months of the year; “transition,” a categorical classification of change between the first and last study year; and normalized “change” in water occurrence between 1984-1999 and 2000-2015.

Compiling data from or close to primary sources was necessary to have adequate resolution for geospatial modeling. The direct practice of processing and applying symbology for various attributes causes the cartographer to critically think about the information, implications of its representation, and for what purposes the maps may be used, given their inherently assertive nature. During this process, the question arose of how effectively these top-down, satellite-derived digital maps show the impacts of human behavior on environment – from larger infrastructural projects upstream, to downstream and coastal acts such as deforestation, intensive

⁴³ Open Development Mekong. <https://opendevelopmentmekong.net/search/data/>

⁴⁴ Pekel, Jean-Francois, Andrew Cottam, Noel Gorelick, and Alan S. Belward, High-resolution mapping of global surface water and its long-term changes. *Nature* 540, 418-422 (2016). doi:10.1038/nature20584

⁴⁵ Natural Earth. <https://www.naturalearthdata.com/downloads/>

⁴⁶ Pekel, Jean-Francois, et al.

agriculture, and pollution – and whether they may be understood by the average lay person, as a primary step toward inspiring participation and action. This question became an additional impetus for creating a print of the Mekong watershed that maps the hydrology of the delta in an expressive and novel way, combining scaled vectors with studied textures and painted strokes in order to create a visual narrative that more closely aligns with cultural visual perception.

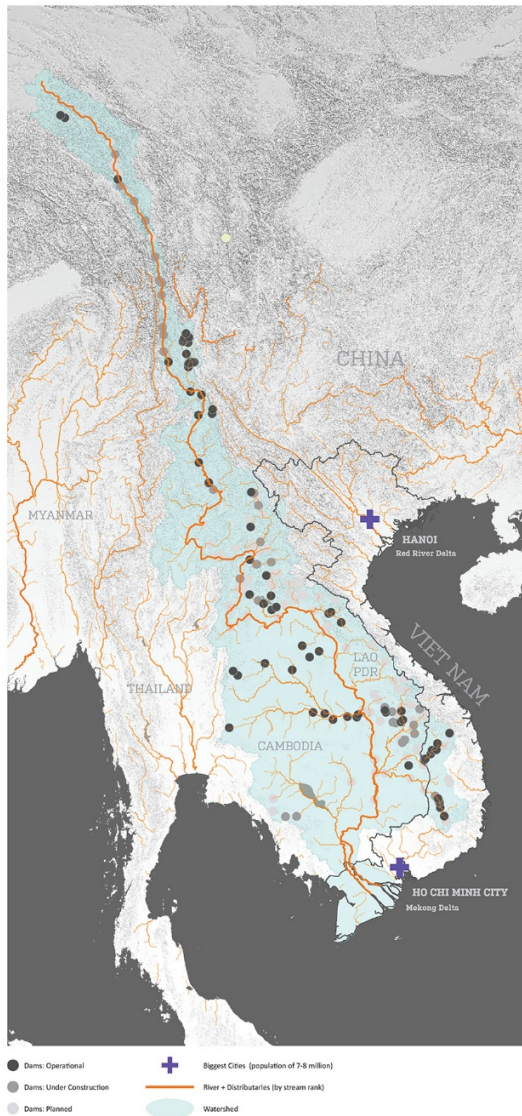


Figure 17. Map of Mekong River watershed

Created by author using GIS data and Adobe programs to show basic context, waterways, and hydropower dams throughout the Mekong River watershed.

Printing the “Big Map”

While searching for hydrological data as a consultancy team, one online application stood out for representing the real-time dynamics of water, simply named “earth.”⁴⁷ With certain layers applied, the swirling motion of lines in close relationship to both each other and the surrounding coastlines inspired the linework for the ocean context of the larger map. Carving these lines into birch plywood wood required carefulness, determination, and thoughtfulness about the technique and material. Ink colors were chosen and blended by roller with the coastal interaction of freshwater, saline oceanwater, sediment and water-borne pollutants in mind.

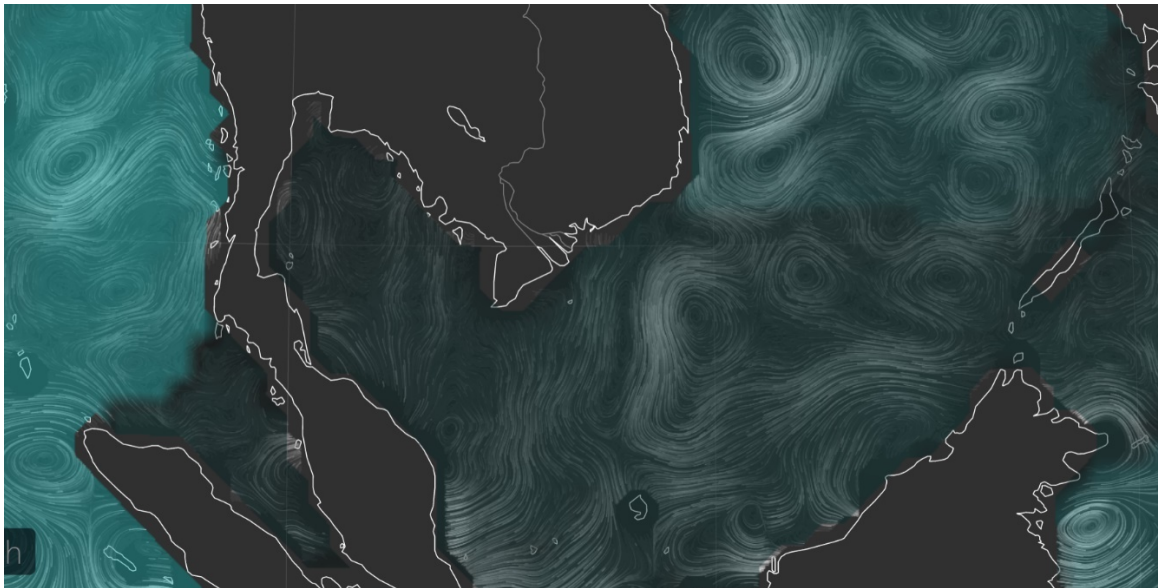


Figure 18. Screenshot of “Earth” Online Application

Visualization of Global Weather Conditions are generated from numerical models from multiple sources and updated between every three hours (ocean waves) and every five days (ocean surface currents).

⁴⁷ Beccario, Cameron. *earth*.

https://earth.nullschool.net/#current/ocean/surface/currents/overlay=primary_waves/orthographic=-257.22,12.35,2599/loc=106.564,11.046



Figure 19. Carving ocean currents

Using the ocean surface current simulation as inspiration and a general guide, freehand lines were carved into birch plywood to suggest the complex system of water movement

After testing one “tile” in the printmaking shop with different paper and ink combinations, remaining coastlines were laser etched onto additional tiles, arranged in a grid formation that references lines of latitude and longitude. While the carved ocean currents are more expressive than scientific, etching scaled, geographically accurate boundaries maintain a level of “real” explanation of the chosen area and context: “An explanatory image is an explanatory image because it is a mapped image.”⁴⁸

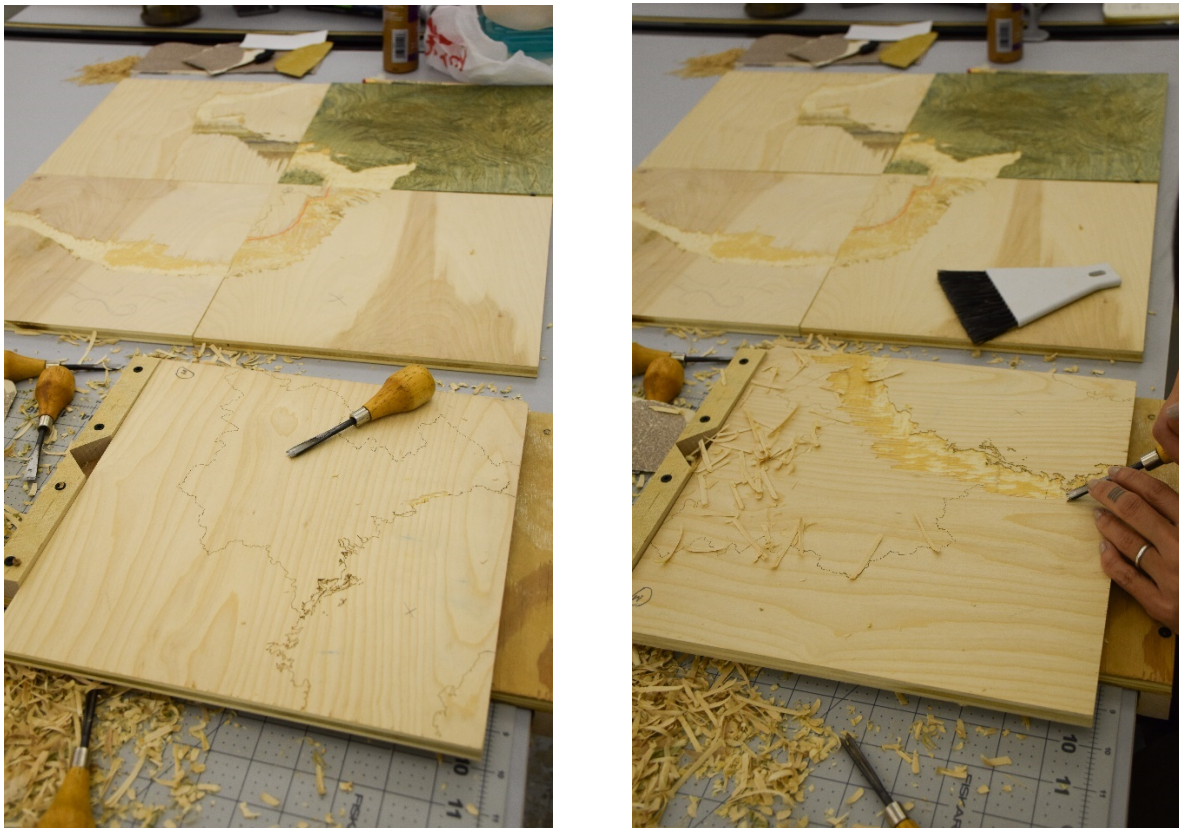


Figure 20. Preparing tiles for the remaining ocean context

For the “big map,” the combined coastline of Việt Nam, Cambodia, and Thailand were engraved onto birch plywood tiles by a Universal Laser Systems X-660 Laser Platform.

⁴⁸ Tufte, *Beautiful Evidence*, 13.

As traditional Vietnamese woodcuts were finished with brushed paint, the author was inspired to show river flows by a different mode of expression within printmaking: monoprint.⁴⁹ For the base map, stream order was calculated from vector data, with varying lineweights applied to them to guide the brushwork. This technique was chosen to reflect the style of post-colonial watercolor artists, and to emphasize the personal uniqueness of a singular stroke and print, while depicting the dynamic flows of the river and its distributaries.



Figure 21. Testing waters [Watercolor monoprint]

Testing monoprint representations of the Mekong River on a smaller format, using watercolor on PETG plastic and a printout of vector linework of the river as a guide.

⁴⁹ “The monoprint is a form of printmaking where the image can only be made once, unlike most printmaking which allows for multiple originals.” <https://www.tate.org.uk/art/art-terms/m/monoprint>

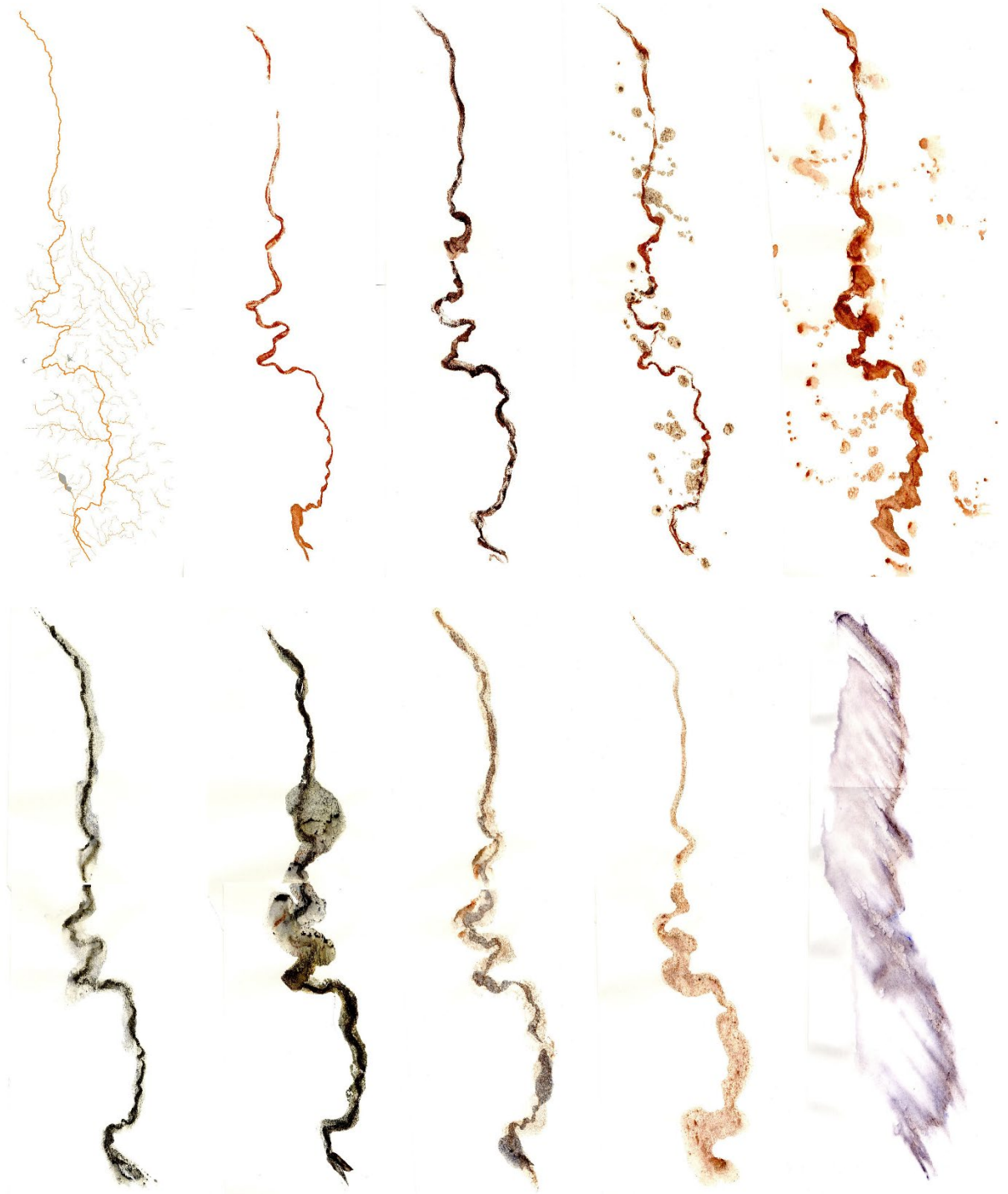


Figure 22. Watercolor monoprint tests

Sample of numerous iterations of the Mekong River, experimenting with color and mixing ratio.

Numerous iterations of the Mekong River were tested on a smaller monoprint setup, using watercolor, gouache, PETG plastic, newsprint, and a printed basemap. The author experimented with mixing ratios, brush speed, pressure, and texture with the aim of demonstrating the river's ephemeral edges, dynamic flows and gradual shifts, and mix of water and sediment.

Ahead of completion of the “big map,” the author compiled vector linework, raster data, and scanned work into a digital mockup (Fig. 21). The finished relief-printed map will be scanned in digitally for expanded use in land analysis and project media, both produced and made available online. This will allow the image to be layered with photos, illustrations, GIS, and other vector- and raster- form data as applicable. This creates another layer of representation, having used data as a guide to a mostly hand-made approach, and then allowing digital adaptation, including those made in response to changing conditions. This allows the work to grow beyond the snapshot in time of both data and created art, but still contributing a base from which a bigger picture and context is expressed.

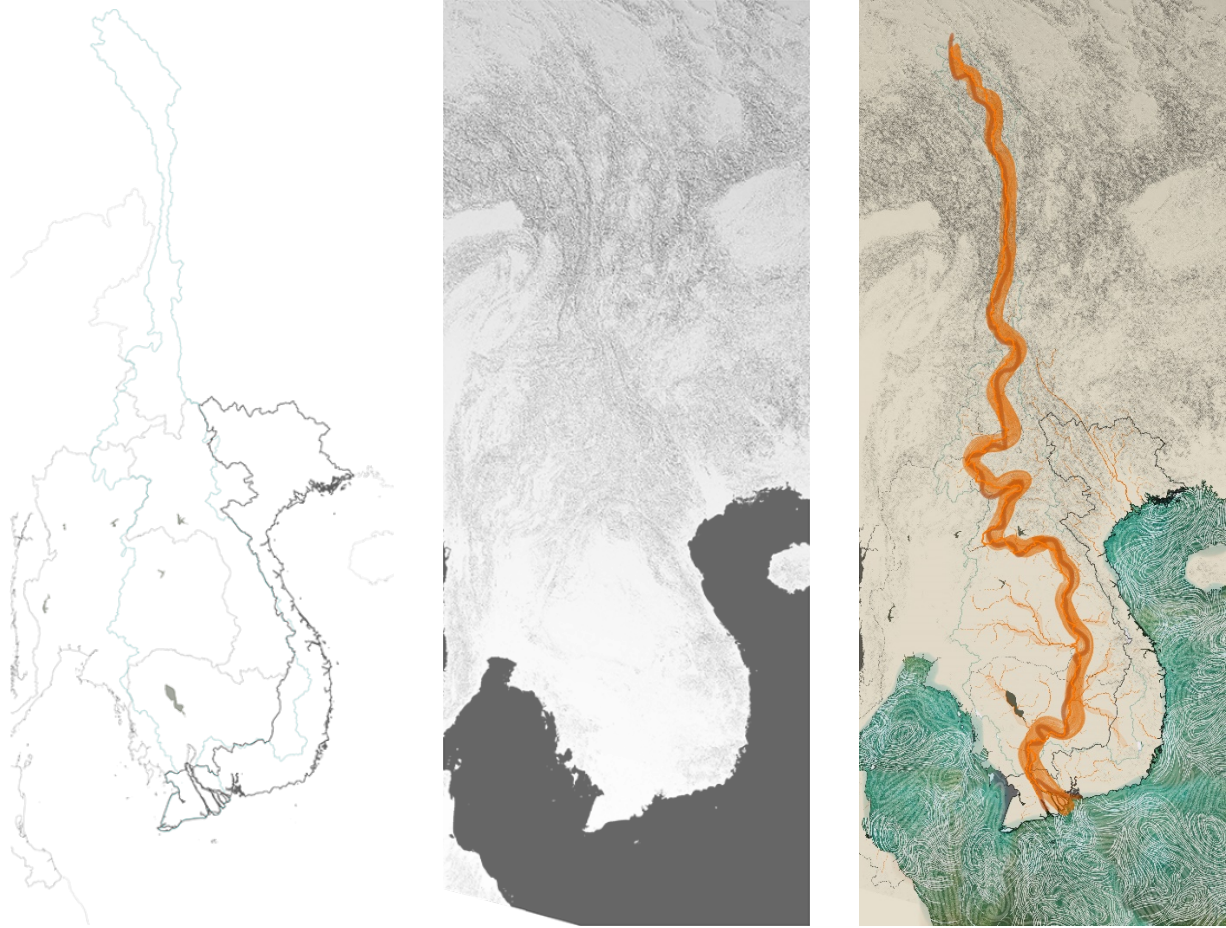


Figure 23. Digital Mockup of the “Big Map”

Vector linework showing political and watershed boundaries; Global ALOS CHILI (Continuous Heat-Insolation Load Index) data layer; Photoshop overlays

Chapter IX.
Project Part 2: Cuốn sách nhỏ

Book Concept

Earlier, the author sought an understanding of the relationship between the people of the Vietnamese Mekong Delta and their environment. This consideration is important when communicating environmental threats and working with communities of people to create solutions. To complement the “big map”, the author proposes a “little book” that will describe the urgent issues facing delta communities, translating components from the larger map using relief printed illustrations. The print and book forms will also communicate the potential local interventions to address these issues, for use in project-related meetings, and to share this complex subject – and unique ways to represent it – with a wider audience.

Experiential Studies in Materiality

Part of creating a human scale narrative, contained in a handheld booklet, is to consider the materials perceived and transformed by hands of delta peoples. Without the ability to experience the subject environment firsthand, the author pursued parallel experiences in order to gain physical insight. A fall semester course on climate change and wetlands provided the opportunity to travel to and launch from Port Fourchon, to visit and engage in black mangrove monitoring stations among coastal Louisiana wetlands. Smaller in scale, yet similar to mangrove forests of the Mekong Delta, black mangrove stands have an important function in restoring brackish and salt water marshes. They filter and trap sediments, have a high capacity as a sink for excess pollutants, and work well with other native plants to reduce wave energy.⁵⁰

³¹ “Plant Fact Sheet: Black Mangrove.” USDA NRCS. https://plants.usda.gov/factsheet/pdf/fs_avge.pdf



Figure 24. Black mangrove stands

Photos by the author from the coast off of Port Fourchon, Louisiana.

The purpose of a late February visit to the LSU AgCenter H. Rouse Caffey Rice Research Station in Crowley, Louisiana was to explore the agriculture-aquaculture combination of rice and shellfish, which operates seasonally and relies on the maintenance of water quality. Cooperative extension plays an important role in the multifunctional sustainability and profitability of rice

and crawfish farming: providing information, monitoring and guidance of techniques, adapted to the climate, seasons, and market. The one-on-one tour experience reinforced the effective model of expert/agents that support and foster innovation in communities, which is also exemplified by Louisiana Sea Grant activities on the coast, including support for Vietnamese diaspora fishermen.⁵¹



Figure 25. Aerial photos of rice fields in Louisiana and Việt Nam

Google Earth views of Long Vĩnh, Duyên Hải, Trà Vinh (commune, district, province), Việt Nam and Crowley, Louisiana

⁵¹ Peveto, Kyle. “Thu Bui: A voice for those who make a living from the water.” LSU AgCenter and College of Agriculture. <https://www.lsuagcenter.com/profiles/lbenedict/articles/page1543857166791>



Figure 26. Dormant rice field and crawfish farming in Crowley, LA

Photos by Phillip Fernberg and author during visit to crawfish ponds at the H. Rouse Caffey Rice Research Station. Rice straw was harvested from this visit for material explorations.

The “Little Book”

Components of the book will be derived from the big map, strategies from organizational reports and journal articles, and elements from the materiality studies and selected art examples. These latter elements will focus on representing strategies on a human scale, zooming in on sediment, mangrove, and rice, with an overall theme of changing water flows. Appropriating themes from propaganda will be for the purpose of utilizing familiar symbols, while placing them in a reality context. A softer style, inspired by wartime watercolor journals and paintings will impart the intimacy of a book in which one can take ownership.



Figure 27. Extracting themes from propaganda poster illustrations

Mapping outlines to extract themes: symmetry, working hands, people in profile, nature organized

The resulting “little book” will describe the urgent issues facing delta communities, translating components from the larger map using relief printed illustrations. The booklet will also communicate the potential local interventions to address these issues, for use in project-related meetings and workshops. The BOP Oyster Gardening Manual developed by MTWTF and SCAPE is an excellent example of illustrating and instructing readers on complex processes. An alternate version of the booklet will be adapted for use in local-level interviews and individual dissemination, with the ability to submit information and responses by hand, mail, or web.

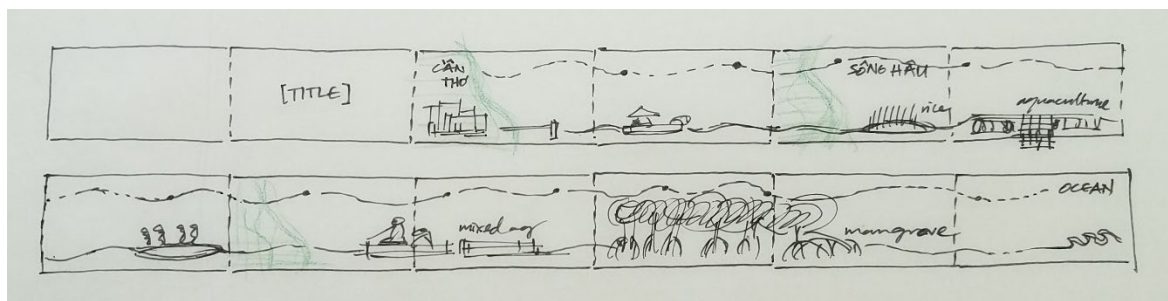


Figure 28. Initial mockup for booklet

Showing interventions along the river

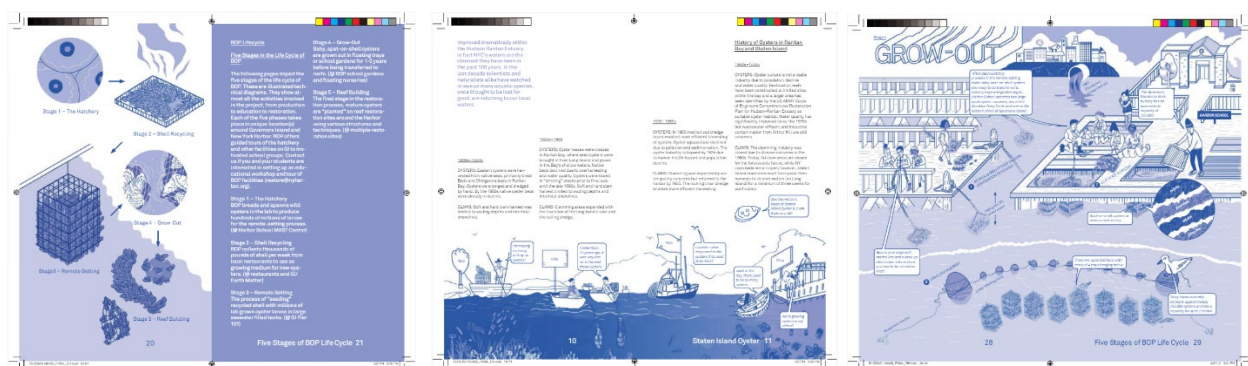


Figure 29. Case Study: BOP Oyster Gardening Manual for schools

Created by MTWTF Graphic Design and SCAPE for Living Breakwaters project (2014)

Chapter X. Conclusion [Proposal]

Specific recommendations on engagement and facilitation will be made for the consultancy's Inception Workshop session - held at the 2019 Mekong Delta Forum, Participatory Modeling Workshop, and pilot Training Workshops, with active collaboration with the *Tangible Landscape* team on associated presentations and training materials. The aim of these contributions will be to improve the efficacy of future workshops conducted by World Bank partners, by placing emphasis on community representation, capacity-building, and empowerment through a comprehensive and culturally adaptive approach.

Project deliverables, with associated themes, are outlined as follows:

- 1) Recommendations to organizations for commune-level participatory planning and citizen engagement [decision-making]
- 2) Workshop media production: Models and posters [exchange of information, discussion]
- 3) Published media: Booklets [dissemination and response]
- 4) Development of online platform: Website and app to crowd source data, observations, suitability, needs and desires, and more [ongoing engagement]

Though the work will be tailored to distinct project circumstances, the proposed collaborative framework can act as a culturally adaptive model for other environmental planning and sustainable development initiatives.

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Vita

Clare-Mai Nguyen, born in Louisville, Kentucky, worked on a biodynamic farm after receiving her Bachelor of Arts in Economics from Bellarmine University in 2009. From 2011 to 2015, she worked as an AmeriCorps member, cooperative extension partner, and community organizer in the areas of urban gardening, environmental education, and food justice.

As her interest in creative community development grew, she decided to enroll in the master's program of the Robert Reich School of Landscape Architecture at Louisiana State University. While at LSU, Mai fulfilled the position of graduate assistant at Hilltop Arboretum and received a Landscape Architecture Endowment Fund Scholarship and Helen A. Reich Memorial Scholarship. She was elected Secretary of the LSU Student Chapter of the American Society of Landscape Architects and plans to represent the chapter in Washington, D.C. on ASLA Advocacy Day 2019.

Upon completion of her master's degree, Mai plans to enter the profession working in a private but public-focused landscape architecture firm, attain licensure, contribute to ASLA, and engage in social issues within her new home community.