

# Ecosystems and Livelihoods

## SFS 3810

### Syllabus

The School for Field Studies (SFS)  
Center for Conservation and Development  
Siem Reap, Cambodia

This syllabus may develop or change over time based on local conditions, learning opportunities, and faculty expertise. Course content may vary from semester to semester.

[www.fieldstudies.org](http://www.fieldstudies.org)

© 2019 The School for Field Studies

Sp19



## **COURSE CONTENT SUBJECT TO CHANGE**

***Please note that this is a copy of a recent syllabus. A final syllabus will be provided to students on the first day of academic programming.***

SFS programs are different from other travel or study abroad programs. Each iteration of a program is unique and often cannot be implemented exactly as planned for a variety of reasons. There are factors which, although monitored closely, are beyond our control. For example:

Changes in access to or expiration or change in terms of permits to the highly regulated and sensitive environments in which we work;

Changes in social/political conditions or tenuous weather situations/natural disasters may require changes to sites or plans, often with little notice;

Some aspects of programs depend on the current faculty team as well as the goodwill and generosity of individuals, communities, and institutions which lend support.

Please be advised that these or other variables may require changes before or during the program. Part of the SFS experience is adapting to changing conditions and overcoming the obstacles that they may present. In other words, the elephants are not always where we want them to be, so be flexible!

## Course Overview

---

The mighty Mekong (derived from *Mae Kongkea*, meaning 'big water'), one of Southeast Asia's most productive and influential rivers, originates high in the Tibetan plateau and weaves south through China, Burma, Thailand, Laos, and Cambodia, finally reaching its terminus in the delta of Vietnam. The Mekong drains an area larger than 310,000 square miles and sheds 110 cubic miles of water into the South China Sea every year.

By world standards, the Mekong catchment and the Tonle Sap Lake are immense, producing over 2.5 million tons of wild fish per year, or roughly two percent of the entire world's catch. The Mekong River is second only to the Amazon River in biodiversity, hosting hundreds of fish species as well as a plethora of bird, reptilian, and mammal species. As the lower Mekong Basin becomes increasingly populated by humans, the river's resources are constantly being stretched – very soon sustainability may no longer be viable, and the health and livelihoods of millions of people may be in jeopardy. As the extraction of natural resources by national and international actors intensifies in the region, the Mekong ecosystems must adapt to new conditions forced upon them by the growing human footprint.

This course focuses on the human landscape that envelops the natural ecosystems of the lower Mekong Basin. We examine the high levels of dependence upon natural resources by local populations and critical threats to various ecosystems. Students explore various rural livelihood strategies and discover a spectrum of adaptations to changing environmental conditions. This course also analyzes attempts by international and national actors to find a sustainable balance between human needs and preserving biodiversity, particularly in the fields of ecotourism and community-based natural resource management.

A variety of ecosystems will be visited in order to provide regional themes of learning in this course:

- The Tonle Sap Lake and various terrestrial sites in the Angkor Basin around Siem Reap, Cambodia, a moderately sized urban area in close proximity to the Angkor temple complex.
- The lowland evergreen forests on the sandstone massif of Phnom Kulen National Park.
- The Mekong River in Kratie province.
- The deciduous dipterocarp forests of northern Cambodia.
- The semi-evergreen rainforest complex of eastern Cambodia.
- The coastal plain and mangrove forests of southern Cambodia where freshwater tributaries from the Cardamom Mountains empty into the Gulf of Thailand.
- The Mekong River delta around the city of Can Tho, a large urban area in southern Vietnam.

## Learning Objectives

---

Students will draw on observations, classes, and field study to recognize major ecosystems of the lower Mekong basin and detail the relationship of human communities with the natural environment. By the end of the course, students should be able to articulate answers to questions related to the following broad themes:

- The diverse ecosystems of Cambodia and the Mekong Delta of Vietnam.
- The critical challenges to regional ecosystems, such as natural resource conflicts, degradation and overuse (e.g. fisheries, forests).
- The spectrum of rural livelihoods in Cambodia and Vietnam, the primary drivers of change in livelihood strategies, and ongoing adaptations to changing environmental conditions.

- The opportunities and challenges posed by community-based natural resource management and ecotourism initiatives.

## Assessment

---

Assessment Item	Value (%)
1. Atlas-TI coding FEX	5
2. Ecotourism analysis FEX	15
3. Comparative livelihoods FEX	25
4. Mid-term exam 1	20
5. Nature field journal	10
6. Final exam	25
<b>TOTAL</b>	<b>100</b>

## Assessment Descriptions

---

**Field Notebook:** You will develop a comprehensive *program field notebook* that documents and captures your on-the-ground learning experiences. This notebook should accompany you at all times in the field. Field notes and data from field exercises for our various courses can all be recorded in this notebook, in separate sections. We recommend you use a separate notebook for class lectures.

For papers you are requested to use the APA citation system and a formal writing style. When referencing field notes and field observations use the following format--this includes an in-text citation in brackets but no entry in your bibliography:

**Livelihood Investigation FEXs (25%):** On a number of our field trips, you will have the opportunity to question various community members about their livelihood strategies and levels of dependence upon natural resources. Before the first of these visits, we will discuss various themes to investigate while in the field. Some of the data may be gleaned through observation, but much of it will require interviewing community members. You will be assigned groups and will design and conduct various livelihood interviews, working with our Khmer translators. Regardless of which student group takes the lead, all students are responsible for recording interview data in field notebooks. You will use the data from two of these field interviews to write a comparative livelihood case study. You will also learn to do analysis using qualitative data analysis software. You will also be uploading climate change-related data from one of these interviews to the World Wildlife Fund's database, Climate Crowd (<https://www.wwfclimatecrowd.org/form>).

**Ecotourism field exercise and analysis FEX (15%):** This assignment will have both field and written components. Before class field trips to two ecotourism sites, you will review Cambodian ecotourism case studies and identify the primary challenges and opportunities these programs face. You will use this data to prepare questions and points to observe while visiting the ecotourism sites.

During the field trips, you will be both a tourist and an analyst—there will be an opportunity to interview assorted community members involved with the projects. Your field notes will be the basis of your analysis in the paper you will write.

Your paper should assess the strengths and challenges of the Popel or Phnom Tnaot CPA ecotourism project and issue a set of recommendations. Using your field observations and data gathered from interviews, you will conduct a SWOT analysis of your assigned site. You will compare your findings to our other case studies and make recommendations as to how these projects could improve their current programming.

**Nature journal (10%):** We take many field trips to various ecosystems. You will learn to draw diagnostic sketches of birds, butterflies, and medicinal plants. You will document your wildlife sightings and plant observations in a field journal and attempt to identify species using field guides. The journal will be collected and graded at the end of the semester.

**Exams (20% midterm / 25% final):**

Each exam must be completed in around 2 hours. They will be writing intensive. All exams are closed-book and conducted under normal exam conditions. You will be given time to study for these exams, including a review class period. You will be examined on what you have been taught in class and what you have been asked to read, so make sure you attend all lectures/field sessions, and understand works from the required reading section.

## Grading Scheme

---

A	95.00-100%	B+	86.00 – 89.99%	C+	76.00 – 79.99%	D	60.00-69.00%
A-	90.00 – 94.99%	B	83.00 – 85.99%	C	73.00 – 75.99%	F	0.00-59.99%
		B-	80.00 – 82.99%	C-	70.00 – 72.99%		

## General Reminders

---

**Readings:** You are expected to have read all the required articles and book chapters prior to each class. Information from required readings will be part of the course assessments. All readings are available as PDFs or from internet hyperlinks. It is encouraged that “optional readings” be reviewed by students. The reading list might be updated or changed during the course of the semester and some readings that are initially listed as optional may be changed to required.

**Plagiarism:** Using the ideas and material of others without giving due credit is cheating and will not be tolerated. A grade of zero will be assigned if anyone is caught cheating or aiding another person to cheat actively or passively (e.g., allowing someone to look at your exam). All assignments unless specifically stated should be individual pieces of work.

**Deadlines:** Deadlines for written and oral assignments are instated for several reasons: They are a part of working life to which students need to become accustomed and promote equity among students. Deadlines allow faculty ample time to review and return assignments before others are due. Late assignments will incur a 10% penalty for each day that they are late. No assignment will be accepted after three days. Assignments will be handed back to students after a one-week grading period.

**Participation:** Since we offer a program that is likely more intensive than what you might be used to at your home institution, missing even one lecture can have a proportionally greater effect on your final grade simply because there is little room to make up for lost time. Participation in all components of the program is mandatory because your actions can significantly affect the experience you and your classmates have while at SFS. Therefore, it is important that you are prompt for all land and water-based activities, bring the necessary equipment for field exercises and Directed Research, and simply get involved.

## Course Content

Key: **L** = Lecture, **F** = Field Component, **W** = Workshop

Lecture Topics	Time (hrs)	Type	Readings & Due Dates	Field Trips/ Assignments
Course introduction <ul style="list-style-type: none"> <li>Ecosystems, natural resources &amp; rural livelihoods in transition</li> </ul>	1.5	L	Readings in <b>bold font</b> are required, others are optional.	
Cambodia's forests: past, present & future				
-Cambodian forest ecosystem types -Watershed: the sacred rivers of Phnom Kulen -Traditional Khmer perceptions of forest -A history of forest exploitation	6	L + FC	le Billon  Fletcher et al  <b>Gaughan et al</b>  <b>Pye &amp; May</b> Wildlife Alliance	Visit to Phnom Kulen's sacred carvings   <i>Nature journal entry: butterflies</i>
Community-based natural resource management (CBNRM)				
Community forestry & non-timber forest product (NTFP) use	1.5	L + FC	<b>NTFP-EP</b>  McKenney et al Sunderlin	
Species identification skills				
Basics of birding: observation & diagnostic skills  Diagramming & identifying insects	1.5	L + FC	Law	Visit to Angkor Thom wall   <i>Nature journal entries: birds &amp; insects</i>
Ecotourism in Cambodia: the search for sustainable livelihood alternatives				
Ecotourism & community-based ecotourism	6	L + FC	<b>Tegelberg</b>  <b>Reimer &amp; Walter</b>  Miura	Visit Popel trail on Phnom Kulen   <i>Ecotourism FEX interview I</i>   <i>Nature journal entry: medicinal plants</i>
Livelihoods in transition I: agricultural shifts				
From subsistence to cash crops: rice, corn & cassava in Cambodia  Resource origin market survey	3.5	L + FC	Hought et al  <b>A River Changes Course</b>	Village visit to learn about local farming practices

Migration & wage labor	1.5	L	<b>Bylander</b>  <b>Mills</b>  Kearney Malkki	Readings will be assigned to 2 groups
Qualitative research analysis tutorial • Using ATLAS.ti to code data	1.5	L	ATLAS.ti 7 Quick Tour	<i>FEX 2 (due Feb. 16)</i>
Cambodia's dry ecoregion				
Characteristic flora & fauna of the deciduous dipterocarp forest (DDF) ecosystem	3.5	L + FC		Visit the Phnom Tnaot CPA ecotourism site  <i>Ecotourism FEX part 2 (due March 4)</i>  <i>Nature journal entry: birds</i>
The Mekong River				
Mekong river hydrology & fish ecology  Dams & environmental activism in Cambodia	4	L	<b>Milne</b>  <b>Deadly Environment</b> Ziv et al	Short film: <i>Fight for Areng Valley</i> by Kalyanee Mam
Highland Cambodia: forests & indigenous livelihoods				
Highland livelihoods: threatened ecosystems and livelihood challenges for the Bunong indigenous people  Guest workshop by Bunong community development organization	3	L + FC	<b>Fox et al</b> Scott	Short film: <i>The Other Cambodia</i>
Livelihoods field trip to a Bunong farm: • Observation of highland farming techniques	2	L + FC	Mertz et al  Fox	Half day visit to Bunong farm
Livelihoods in transition II: traditional medicine				
Traditional medicine in Cambodia: use, collection & trade	1.5		<b>Ashwell &amp; Walston</b>	
Midterm exam review	1.5			



Tonle Sap Lake: ecosystems and livelihoods on the Great Lake				
<ul style="list-style-type: none"> <li>• Avifauna of a flood pulse ecosystem</li> <li>• Livelihoods on the lake</li> <li>• Guest speaker: Osmose on alternative lake livelihoods</li> </ul>	6	L + FC	Berdick  Deap, Degan & Zalimbe  <b>Navy et al</b>  Joffrey et al  Nuorteva et al  Sneddon & Fox	Interview with family at the floating village of Prek Toal  <i>Comparative Livelihoods FEX Part I</i>
<ul style="list-style-type: none"> <li>• Wetland birding observations</li> </ul>	1.0	FC		Field trip to Phnom Krom wetlands  <i>Nature journal entry: waterbirds</i>
The Cambodian coast				
<ul style="list-style-type: none"> <li>• Coastal mangrove ecosystems &amp; fishing livelihoods</li> </ul>	2.5	L	Rizvi & Singer	Short film: <i>Lost World</i> by Kalyanee Mam
<ul style="list-style-type: none"> <li>• Community-based natural resource management (CBNRM): opportunities &amp; challenges</li> <li>• Guest speaker: Sim Himm, head of Trapeang Sangker community fishery</li> </ul>	4.0	L + FC	CBNRM Learning Institute  <b>Marschke &amp; Berkes 2005</b>  Van Acker	Visit to Cham community mangrove conservation site  Livelihood interview with Cham fishers  <i>Comparative Livelihoods FEX Part II (Due Oct. 26)</i>
Vietnam's Mekong Delta: intensive landscape adaptation & its consequences				
<ul style="list-style-type: none"> <li>• Lectures &amp; field trips by Can Tho University faculty</li> <li>• Agricultural reconstruction lecture for Cambodia &amp; Vietnam</li> </ul>	5.5	L + FC	Biggs  <b>Kakonen</b>  <b>Keskinen</b>  Ives  Schmitt et al	Visit to Ang Giang Province flood dykes  Tra Su melaleuca forest visit  <i>Nature journal entry: waterbirds</i>

Livelihoods in transition III			
Globalization & local livelihoods	1.5		<b>Tsing</b>
Final exam review session	1.5		
<b>Total hours</b>	<b>60.5</b>		

## Reading List

Ashwell, D. & Walston, N. (2008). An overview of the use and trade of plants and animals in traditional medicine systems in Cambodia. Hanoi: TRAFFIC Southeast Asia, Greater Mekong Programme.

Bylander, M. (2015). Contested mobilities: Gendered migration pressures among Cambodian youth. *Gender, Place & Culture: A journal of feminist geography* 8, 1124-1140.

Fox et al. (2009). Policies, political-economy, and swidden in Southeast Asia. *Human Ecology* 37, 305-322.

Gaughan, A. E., Binford, M.W., & J. Southworth. (2008). Tourism, forest conversion, and land transformations in the Angkor basin, Cambodia. *Applied Geography*, 29(2), 212-223

Global Witness. (2013). Deadly environment: The dramatic rise in killings of environmental and land defenders. <https://www.globalwitness.org/documents/12993/deadly%20environment.pdf>

Hought, J., Birch-Thomsen, T., Petersen, J., de Neergaard, A., & M. Oelofse. (2012). Biofuels, land use change and smallholder livelihoods: A case study from Banteay Chhmar, Cambodia. *Applied Geography*, 34, 525-532.

Kakonen, M. (2008). Mekong Delta at the crossroads: More control or adaptation? *Ambio* 37(3), 205-212.

Keskinen, M. (2008). Population, natural resources & development in the Mekong: Does high population density hinder development? In M. Kummu, M. Keskinen, & O. Varis, (Eds.), *Modern myths of the Mekong: A critical review of water and development concepts, principles and policies* (pp. 107-121). Helsinki: Water and Development Publications, Helsinki University of Technology.

Marschke, M. & F. Berkes. (2005). Local level sustainability planning for livelihoods: A Cambodian experience. *International Journal of Sustainable Development & World Ecology* 12, 21–33.

Mills, M.B. (1997). Contesting the margins of modernity: Women, migration, and consumption in Thailand. *American Ethnologist* 24(1), 37-61.

Milne, S. (2017). On the perils of resistance: Local politics and environmental struggle in Cambodia. *The Network: The Newsletter* 78, 32-33.

Navy, H., Chuenpagdee, R., & Kurien, J. (2006). Livelihood importance and values of Tonle Sap Lake fisheries. [http://www.worldfishcenter.org/resource\\_centre/Livelihood.policy%20review%20-%20English.pdf](http://www.worldfishcenter.org/resource_centre/Livelihood.policy%20review%20-%20English.pdf)

Non-Timber Forest Products Exchange Programme (NTFP-EP) for South and Southeast Asia. (2009). Case study project report. On the Cusp of Start-up and Build-up: Enterprise Development Assistance to Emerging Community-based NTFP Enterprises (Forest Honey and Indigenous Crafts) in Northeast Cambodia - Memorandum of Understanding [PP-A/43-232]. Phnom Penh: NTFP-EP.

Pye, D. & T. May. (2014, October 10). The calculus of logging. *The Phnom Penh Post*. <http://www.phnompenhpost.com/national/calculus-logging>.

Reimer, J. K. & P. Walter. (2012). How do you know it when you see it? Community-based ecotourism in the Cardamom Mountains of southwestern Cambodia. *Tourism Management*, 34, 122-132.

Scott, J. (2000). Hill and valley in Southeast Asia... or why the state is the enemy of people who move around... or... why civilizations can't climb hills. Unpublished conference paper for the 2000 Symposium: Development and the Nation State in Washington University, St. Louis.

Tegelberg, M. (2010). Hidden sights: Tourism, representation and Lonely Planet Cambodia. *International Journal of Cultural Studies* 13: 491-509.

Tsing, A. (2000). The global situation. *Cultural Anthropology* 15(3), 327-360.

## Optional Readings

---

AtlasTI user manual (2014). Retrieved from [http://atlasti.com/wp-content/uploads/2014/05/QuickTour\\_a7\\_en\\_07.pdf](http://atlasti.com/wp-content/uploads/2014/05/QuickTour_a7_en_07.pdf)

Arensen, L. (2012). Displacement, diminishment, and ongoing presence: the state of local cosmologies in Northwest Cambodia in the aftermath of war. *Asian Ethnology* 71(2), 159-178.

Berdick, C. (2014). The giving flood. *VQR*, 90(3). <http://www.vqronline.org/reporting-articles/2014/06/giving-flood>

Biggs, D. (2010). *Quagmire: Nation-building and nature in the Mekong Delta*. Washington: University of Washington Press.

le Billon, P. (2002). Logging in muddy waters: The politics of forest exploitation in Cambodia. *Critical Asian Studies*, 34(4), 563-586.

Community-Based Natural Resource Management (CBNRM) Learning Institute. (2008). Unpublished briefing note on CBNRM perceptions research. Phnom Penh: CBNRM.

Deap, L., Degen, P. & van Zalinge, N. (2003). *Fishing gears of the Cambodian Mekong*. Inland Fisheries Research and Development Institute of Cambodia (IFReDI). Phnom Penh: Cambodia Fisheries Technical Paper Series (*Volume IV*).

Fletcher, R., Penny, D., Evans, D., Pottier, C., Barbetti, M., Kummu, M., T. Lustig & Authority for the Protection and Management of Angkor and the Region of Siem Reap (APSARA) Department of

Monuments and Archaeology Team (2008). The water management network of Angkor, Cambodia. *Antiquity*, 82, 650-670.

Fox, J. (2000). How blaming 'slash and burn' farmers is deforesting mainland Southeast Asia. *Analysis from the East-West Center* 47, 1-7.

Global Witness. (2013). Rubber barons: How Vietnamese companies and international financiers are driving a land grabbing crisis in Cambodia and Laos. [https://www.globalwitness.org/documents/10525/rubber\\_barons\\_lores\\_0\\_1.pdf](https://www.globalwitness.org/documents/10525/rubber_barons_lores_0_1.pdf)

Hart, E., & DuBasky, V. (Eds.). (2015). *The illustrated guide to the wildlife of Cambodia*. New York: Heron on Hudson Press.

Hayes et al. (2013). A biodiversity assessment of Phnom Kulen National Park, with recommendations for management. [www.rufford.org/files/11488-1%20Detailed%20Final%20Report\\_0.pdf](http://www.rufford.org/files/11488-1%20Detailed%20Final%20Report_0.pdf)

Hogan, Z. S., Moyle, P. B., May, B., Zanden, M. J. V., & Baird, I. G. (2004). The imperiled giants of the Mekong: Ecologists struggle to understand—and protect—Southeast Asia's large migratory catfish. *American Scientist*, 92(3), 228-237.

Ives, M. (2013). In Mekong Delta, rice boom has steep environmental cost. [http://e360.yale.edu/feature/in\\_mekong\\_delta\\_rice\\_boom\\_has\\_steep\\_environmental\\_cost/2670/](http://e360.yale.edu/feature/in_mekong_delta_rice_boom_has_steep_environmental_cost/2670/)

Joffre, O., Kura, Y., Pant, J. & S. Nam. (2010). Aquaculture for the poor in Cambodia – lessons learned. Phnom Penh: The WorldFish Center.

Kearney, M. (1986). From the invisible hand to visible feet: Anthropological studies of migration and development. *Annual Review of Anthropology*, 15, 331-361.

Killeen, T. (2012). *The Cardamom conundrum: Reconciling development and conservation in the Kingdom of Cambodia*. NUS Press: Singapore.

Law, J.M. (2016). *The Laws guide to nature drawing and journaling*. Heyday Books: Berkeley.

Malkki, L. (1992). National geographic: The Rooting of Peoples and the Territorialization of National Identity among Scholars and Refugees. *Cultural Anthropology* 7(1), 24-44.

Marschke, M. & F. Berkes. (2006). Exploring strategies that build livelihood resilience: A case from Cambodia. *Ecology and Society* 11(1), 42.

Marschke, M. & A.J. Sinclair. (2009). Learning for sustainability: Participatory resource management in Cambodian fishing villages. *Journal of Environmental Management* 90, 206-216.

McKenney, B., Chea, Y., Tola, P., & T. Evans. (2004). Focusing on Cambodia's high value forests: Livelihoods and management. Phnom Penh: Cambodia Development Resource Institute and Wildlife Conservation Society.

Mertz et al. (2009). Swidden change in Southeast Asia: Understanding causes and consequences. *Human Ecology* 37, 259-264.

Millennium Ecosystem Assessment. (2005). *Ecosystems and Human Well-being: Synthesis*. Washington, D.C.: Island Press.

Miura, K. (2000). Social anthropological research on the people of Angkor: Living with a world heritage site. *Siksacakr* 2, 15-21.

Mekong River Commission. (2010). Social impact monitoring and vulnerability assessment: Report on a regional pilot study for the Mekong Corridor. Mekong River Commission Technical Paper, No. 30.

Nuorteva, P., Keskinen, M., & O. Varis. (2010). Water, livelihoods and climate change adaptation in the Tonle Sap Lake area, Cambodia: Learning from the past to understand the future. *Journal of Water and Climate Change* 1(1), 87-101.

Persson, L. et al. (2010). *Ecosystem services supporting livelihoods in Cambodia*. Stockholm: Stockholm Environment Institute.

Rizvi, A.R. & U. Singer. (2011). Cambodia coastal situational analysis. *Building resilience to climate change impacts, coastal Southeast Asia No. 6*. IUCN.

Rundel, P., Middleton, D., Patterson, M., & M. Meng. (2003). Structure and ecological function in a tropical montane sphnagnum bog of the Elephant Mountains, Bokor National Park, Cambodia. *Natural History Bulletin of the Siam Society*, 51(2), 185-196.

Sneddon, C., & C. Fox. (2012). Inland capture fisheries and large river systems: A political economy of Mekong fisheries. *Journal of Agrarian Change*, 12(2-3), 279-299.

Stone, R. (2009). Divining Angkor. *National Geographic*.  
<http://ngm.nationalgeographic.com/2009/07/angkor/stone-text>.

Sunderlin, W. (2006). Poverty alleviation through community forestry in Cambodia, Laos, and Vietnam: An assessment of the potential. *Forest Policy and Economics*, 8, 386–396.

United Nations Development Programme. (2012). Tmatboey community protected area Committee, Cambodia. New York: Equator Initiative Case Study Series.

USAID. (2005). Conservation of tropical forests and biological diversity in Cambodia. USAID Analysis Report.

Van Acker, F. (2010). *Free riders and social fences: Common property, collective action and decentralized natural resource management in Cambodia*. Phnom Penh: The Learning Institute and Administrative Reform and Decentralization Program (ARDP) of German Development Cooperation.

Wildlife Alliance. (2013). Phnom Kulen National Park: Forest cover, land use and threat assessment. Phnom Penh: Wildlife Alliance.

Winemiller, et al. (2016). Balancing hydropower and diversity in the Amazon, Congo and Mekong. *Science*, 351 (6269), 128-129.

Winrock International. (2014). Exploring the Conservation Success in Eastern Plains and Prey Lang Landscapes, Vol. 1. Phnom Penh: Winrock International.

Ziv et al. (2012). Trading-off fish biodiversity, food security, and hydropower in the Mekong River Basin. *Proceedings of the National Academy of Sciences of the United States of America* 109(15), 5609-5614.