Gendered Impact of the All Year Fishing Ban as a Double-edged Sword of Conservation on Professional Fishers around the Erhai Lake in Yunnan, China

Sai Tang, Kyoko Kusakabe

22nd November, 2022

Fishing ban as a double edged sword of conservation & Gendered impact

---

➢ **Fishing bans/marine protected areas**(MPAs);--- In **China**, top-down fishing ban policies--natural **plateau lakes in Yunnan** province---**Ecological benefit vs. Socio-economic impacts**;

➢ **Conservation as a double-edged sword** with its sustainable benefit and socio-economic impact on both ends;---Some groups are excluded, consequence of **displacement and livelihood loss**;

➢ The double-edged sword effect in **technological transformation in traditional fisheries-**--unintentional negative impact on traditional production. --- **Women in traditional fisheries in Kerela**, Indian are more negatively affected by mechanization, being **deprived of access to the benefits of the development of local fisheries** compared to their male counterpart(Gopal, et al., 2014).

➢**Women might be more impacted** by conservation policies**; Gender and other structural factors** causes different impact and responses (Colwell et al., 2017; etc..);

➢**Currently researches on the gender effect of conservation** on fishing communities around the world are still limited. ---**provide reference** to the development of sustainable inland fishery and future research.

➢This research is to analyze the gender dynamic between women and men in the professional fishing community around the Erhai Lake under conservation.

Context of Erhai Lake and study site

➤ The **second largest** plateau lake in Yunnan province, with surface areas more than 1000 km(Zhu, 2007, 2010). --- **620,000 residents** in the area(Cao, 2019);---Long **history of fishing of the indigenous Bai** ethnic residents;

➤ **Local economy mainly depend on tourism** of the Erhai lake and the surrounding Canshan Mountain & unique Bai ethnic culture and history (UNESCO World Heritage, 2001).

➤Consequences of **over-exploitation and unregulated tourism**(Tang et al., 2013);

➤Conservation **started in 1990s** lake side aquaculture cancelled;

➤2004 to 2016 **seasonal fishing ban** 6 months to 9 months;

➤2017 total fishing ban except the **regulated fishing period**;

➤2017 "the **Seven Major Actions**";

➤2018 "**Ecological Corridor**" (Lin & Lu, 2021; etc..).

- Shacun Village in Xizhou Town;

- One of the **largest professional fishing villages**;

- national land revolution in the 1950s & geographical characteristic & dense population(Yang, 2015)---**professional fishers total dependency on fishing as livelihood**;

- **Both women and men participate in all stages of fishing** in the **unite of household**(Yang, 2015). ---Women can fish alone.

- **Traditionally**, husband and wife went fishing on one boat and live on the boat for days or even months and sold their catch on the trip. ---**Nowadays**, husband and wife still fishing on one boat but **with more modernized tools.**

Methodology

- **Mixed method research;**

- **Household questionnaire survey, in-depth interview, key informant interviews, unstructured observation;**

- **December, 2021 to January 2022;**

- Fishing Household livelihood Questionnaire Survey: with 95% confidence level, sample size $= \frac{120}{1+120(0.05)^2} = 92.3 \rightarrow 110$ (Yamane, T. , 1973).

- 4 key informants;

- 24 IDI respondents(unstructured interview / snowball sampling and purposive sampling/over 30 years old/having dependent household members)

- SPSS & Provisional coding and narrative analysis

Demographic Information of Questionnaire Respondents

		Frequency	Percentage
Age	Under 35 years old	7	6.4%
	35 to 50 years old	49	44.5%
	51 to 55 years old	18	16.4%
	Over 55 years old	36	32.7%
Gender	Male	51	46.4%
	Female	59	53.6%
Marital Status	Unmarried	2	1.8%
	Married	103	93.6%

In-depth Interviewee Information

Name	Age	Gender	Education level	Livelihood situation
ZRL	48	Female	Junior High	Fishing
LCH	49	Female	Junior High	Selling fish
YDL	48	Female	Primary education	Fishing
YXQ	46	Female	Higher education	Fishing &Cloth business
YJD	51	Female	Junior high	Selling fish gear
SJM	43	Female	Junior high	Unemployed
YHJ				
AY				
YAY				
YYY				
LBW				
YG				
DLH				
HWL				
BLP				
ZZH				
ZWH				
QYS				
YFH				
YS	59	Male	Primary education	Retired
YBS(CP1)	44	Female	Primary education	Fishing
ZLZ(CP1)	46	Male	Primary education	Fishing
ZLY(CP2)	37	Female	Primary education	Migrated/construction worker
LYQ(CP2)	42	Male	Primary education	Migrated/construction worker

	Education level	Junior high	Senior high	Higher education	Primary education
				0	0
Years in management team	More than 10 years	One year			
Positions	Deputy village Head/Head of fishery production team 1	Head of fishery production team 3	Representative of fishery production team 3	Representative of fishery production team 1

Finding 1 Both Women and Men Lost the Right of Fishing as Livelihood

➤ **Most households(93.6%)** depend on fishing in their own boats before 2017;

➤ Most fishers were **not able to find new livelihood**;

➤ **Difference between men and women fishers' livelihood conditions** before and after the fishing ban are **not significant**. (Pearson chi-square tests).

➤ **Loss of fishing as livelihood for both women and men**;

Gender and livelihood conditions before and after 2017 Pearson Chi-Square

	Livelihood Before 2017						Current livelihood				
	Gender		Total	χ^2	p		Gender		Total	χ^2	p
	Male	Female					Male	Female			
Fish on household-owned boats	50 98.0%	53 89.8%	103 93.6%			Do fishing related work	29 56.9%	29 49.2%	5 8 52.7%		
Do fishing related work for other HH	0 0.0%	3 5.1%	3 2.7%			Do wage work in nearby areas	4 7.8%	1 1.7%	5 4.5%		
Collecting fish from fishing household/Selling fish	1 2.0%	1 1.7%	2 1.8%	4.530ª	0.210	Run small/tourism related business	2 3.9%	4 6.8%	6 5.5%	4.567ª	0.471
Didn't do fishing related work	0 0.0%	2 3.4%	2 1.8%			Employed by public sector	0 0.0%	1 1.7%	1 0.9%		
Hired to fish on boat of other HH	0	0	0			Unemployed	15 29.4%	22 37.3%	3 7 33.6%		
Do fishing related work for own HH	0	0	0			Others	1 2.0%	2 3.4%	3 2.7%		
Total	51 100.0%	59 100.0%	110 100.0%			Total	51 100.0%	59 100.0%	110 100.0%		

Finding 2   Dramatic Decrease of Fishing Days

➢ **Before 2017, 6 months' legal fishing period**, fishers can fish any time of the day. (price of the **fishing permit** under 200 RMB & discount for pf; **unstrict implementation**);

➢ **74.5% households engaged in illegal fishing** for **at least 2 or 3 months**;

➢ **Since 2017, an official regulated fishing period** about 2 months long every year (**not fixed**; **price of fishing permit increased** to more than 10 times for both pf and non-pf fishers in 2021; **strict implementation**);

➢ **64.6% households engaged in illegal fishing** for about **one month in total**;

Household Fishing Days

Fishing days	Before 2017	After 2017
	Frequency	Frequency
0 days	6 (5.5%)	24 (21.8%)
Less than 60 days	0	15 (13.6%)
60 to 90 days	4 (3.6%)	51 (46.4%)
91 to 120 days	0	16 (14.6%)
121 to 180 days	18 (16.4%)	3 (2.7%)
181 to 240 days	45 (40.9%)	1 (0.9)
More than 240 days	37 (33.6%)	0

Finding 3　Important Role of Key Household Assets in Fishing Production after the ban

➢**HH owing key transportation vehicle**(light or minivan, or private car) were more likely to **have more fishing days after the ban** (Pearson chi-square test).

➢**transporting fishing gears** to other fishing sites far away --- improve the efficiency especially for advantageous HH;

➢HH transportation **controlling right is gendered**. --- In most households, women don't have the controlling right of the car;---**Men decide fishing site and drive** --- **women more dependent** on men's fishing decision.

Car Ownership and Fishing Days After 2017 Pearson Chi-Square

		Car ownership		Total	χ²	*p*
		Yes	No			
Fishing days after 2017	0 days	12	12	24		
		27.9%	17.9%	21.8%		
	less than 60 days	2	13	15		
		4.7%	19.4%	13.6%		
	60 to 90 days	17	34	51		
		39.5%	50.7%	46.4%	13.122ᵃ	0.01
	91 to 120 days	8	8	16		
		18.6%	11.9%	14.5%		
	more than 120 days	4	0	4		
		9.3%	0.0%	3.6%		
Total		43	67	110		
		100.0%	100.0%	100.0%		

Finding 4 Women's Less Participation in Illegal Fishing Trips After the Ban

➢**Before 2017, women are indispensable for fishing trip**. ---**Most pre and post harvest work done by women;**

➢**After 2017, increased risk and danger**(simple makeshift float & no light & strong wind & patrol teams coming out frequently & heavy punishment);

➢enough men labor, **women participate less** Or **men from two or three households go together** ---men stopped sharing other related work;

➢The **changes in arrangement-**--reduces women's **access to resource** --- makes women more dependent on men's working--- **increases risk of illegal fishing for men**;

Finding 5   Convention of Women in Charge of Household Money Becomes Reason of Vulnerability

➤ a reflection of **women's access to assets in some degree** but money **management right doesn't mean real power** the household;

➤ a **burden for women** to borrow money and balancing debt after the ban;

➤ **After 2017, the income of PF HH has entirely dropped** to a lower level(over half HH not enough);

➤ **Women were more likely to report lower household income** than men(Pearson chi-square test). ---more economic stress

Household Income Conditions

		Before 2017		After 2017	
		Frequency	Percent	Frequency	Percent
Yearly	No income	0	0	12	10.9%
House	Less than 10,000 RMB	2	1.8%	8	7.3%
-hold	10,001-20,000 RMB	25	22.7%	38	34.5%
Income	20,001-50,000 RMB	56	50.9%	38	34.5%
	50,001-100,000 RMB	18	16.4%	12	10.9%
	100,001-200,000 RMB	5	4.5%	0	0
	More than 200,000 RMB	4	3.6%	2	1.8%

Gender and Yearly HH Income after 2017 Pearson Chi-Square

		Gender		Total	χ^2	p
		Male	Female			
Yearly	No income	3	9	12		
HH		5.9%	15.3%	10.9%		
Income	Less than 10,000	1	7	8		
after	RMB	2.0%	11.9%	7.3%		
2017	10,001-20,000	24	14	38		
	RMB	47.1%	23.7%	34.5%		
	20,001-50,000	15	23	38	13.304[a]	0.021
	RMB	29.4%	39.0%	34.5%		
	50,001-100,000	6	6	12		
	RMB	11.8%	10.2%	10.9%		
	More than 200,000	2	0	2		
	RMB	3.9%	0.0%	1.8%		
Total		51	59	110		
		100.0%	100.0%	100.0%		

- **Debt taking tradition** to maintain fishing as livelihood &daily expenses
- **The cycle of debt**

- **More households become in debt and the overall debt amount increased after 2017**;
- **Women reported more debt** than men both before and after 2017 due to more economic pressure.
- Gender norm --- women to take up **the responsibility of debt taking** and accepted the **potential repercussions in social life**.

Gender and Household Debt before and after 2017 Pearson Chi-Square

|		Before 2017					After 2017				
		Gender		Total	χ²	p	Gender		Total	χ²	p
		Male	Female				Male	Female			
	No debt	29	18	47			15	6	21		
		56.9%	30.5%	42.7%			29.4%	10.2%	19.1%		
	10,000-50,000 RMB	14	17	31			12	8	20		
		27.5%	28.8%	28.2%			23.5%	13.6%	18.2%		
HH Debt	50,000-100,000 RMB	5	9	14			9	17	26		
		9.8%	15.3%	12.7%			17.6%	28.8%	23.6%		
	100,000-150,000 RMB	0	6	6	14.95[a]	0.01	4	9	13	10.80[a]	0.05
		0.0%	10.2%	5.5%			7.8%	15.3%	11.8%		
	150,000-200,000 RMB	1	0	1			1	1	2		
		2.0%	0.0%	0.9%			2.0%	1.7%	1.8%		
	More than 200,000 RMB	2	9	11			10	18	28		
		3.9%	15.3%	10.0%			19.6%	30.5%	25.5%		
Total		51	59	110			51	59	110		
		100.0%	100.0%	100.0%			100.0%	100.0%	100.0%		

Finding 6   Women and Men's Participation in Mahjong Playing in the Village

➢After 2017, the **popularity of Mahjong playing rises** ---to deal with the **stress and frustration of not being able to fish**.

➢**Women participate less than men** after finishing **domestic responsibilities** --- men can participate any time / routine.

➢**Men spend more money** than women in the game(bet amount higher than women's).---Women prioritize HH expenses;

➢The motivation --- **men for socializing** with other men in the community & **possibility of gambling**;

➢**Difference in sense of responsibility** to the family---Women have a stronger tendency of keeping their life as normal as possible. --- **more vulnerable to outside shocks**, such as economic impact of Covid-19, etc.;
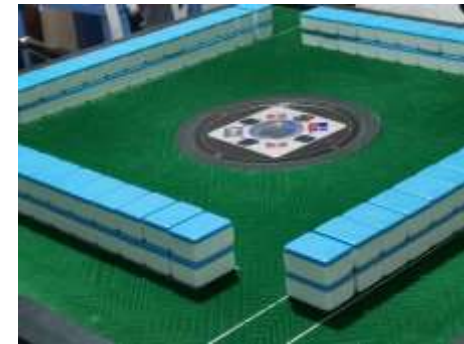
CONCLUSION

•Conservation have social and economic impact on **individuals dependent on resource and environment**. Fishing bans in China as double-edged sword help realize sustainable goals but the **exclusionary effect on disadvantaged groups** is also evident.

•This study found that **livelihood impact of the fishing ban and related measures is gendered**. Both women and men have been impacted, but **women are faced with more vulnerabilities due to patriarchal gender norms**.

•With **household fishing days decreased dramatically**, **women's participation in illegal fishing trips decreased they becomes more dependent on men's fishing activities**.

•The **convention** of women in charge of household money becomes the **reason of vulnerability**.

•**Women showed more responsibility to keep family life as normal as possible**, while men go for Mahjong playing as a way to deal with the stress of not being able to fish.

•Women are more likely to experience exclusion under conservation.

•This study **adds to the literature on gender and conservation** with implications for more inclusive policy making to achieve the balance between conservation benefit and economic interest of impacted population.

Thank you