



**Proceedings of Seminar
on**



Small-Scale Fisheries in Nepal



**16th August 2023
Kathmandu
Nepal**

Organized by:

**Nepal Fisheries Society
&
Too Big To Ignore (TBTI)-Global**



“Let’s Talk about Small-Scale Fisheries”

Join Professor Ratana Chuenpagdee of Memorial University of Newfoundland, Canada in the discussion about the values and importance of small-scale fisheries

Wednesday 16th August 2023, 9am 1 – pm
(Shrawan 31, 2080 BS)

Venue:

**Central Fisheries Promotion and Conservation Centre
Balaju, Kathmandu, Nepal**

Organizers:

**Nepal Fisheries Society
&
TBTI Global**

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AGENDA
“Let’s Talk about Small-Scale Fisheries”

Seminar on Small-Scale Fisheries with Professor RatanaChuenpagdee
Organized by Nepal Fisheries Society and TBTI Global
16th August 2023 (Shrawan 31, 2080 BS), Wednesday
Balaju, Kathmandu, Nepal

Time	Program host by Tek B. Gurung
10.30-10.45	Registration & Tea (By NEFIS, Mr. Subhash Jha, Fisheries Officer)
10.45-10.50	Welcome Remarks Dr. Madhav Shrestha, Advisor & Past President Nepal Fisheries Society
10.50-10.55	Inauguration of the program by the Chief Guest and Professor Ratana Chuenpagdee
10.55-11.10	Status of small-scale fisheries in Nepal Sarita Gautam ¹ , Akbal Husen ² , Santoshi Shrestha ³ , Sunila Rai ⁴ ¹ Director, Central Fisheries Promotion and Conservation Center ² Chief, Fisheries Research Station, Pokhara ³ Asst. Professor, TU ⁴ Professor & Controller (exam), Agriculture and Forestry University, Nepal
11.10-11.25	Impact of hydrodam on fishes of rivers in Nepal Deep BahadurSwar Fish Expert, Past Secretary, Government of Nepal
11.25-11.40	Small-Scale fisheries communities of Koshi Barrage areas Nelson Pokharel Fisheries Officer, Koshi Pradesh
11.40-11.55	Small-Scale Fisheries are Too Important To Fail RatanaChuenpagdee Professor and Coordinator, TBTI Global
11.55-11.10	Discussion
11.10-11.35	Remarks by special guests: <ul style="list-style-type: none"> • AkbalHusen • Prof Durga Mani Adhikari
11.35-11.40	Vote of Thanks to Professor Ratana Chuenpagdee & guests : Mr. Rama Nand Mishra (Advisor and Past President NEFIS)
11.40-11.55	Memento to Prof. Ratana and guests by President of NEFIS
11.55-12.05	Remarks by Chief Guest Mr. Shiv Sundar Shrestha
12.05-12.10	Concluding remarks by President of NEFIS, and adjourn of the Seminar
12.10-13.00	Refreshment

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Overview on Small Scale Fisheries (SSF) in Nepal

Presented by: Sarita Gautam, Sunila Rai Saroj Yadav, Akbal Husen, Santoshi Shrestha

What is SSF?

- Also Known as artisanal fisheries, traditional fisheries or subsistence fisheries.
- Consist of small scale, low technology, low capital fishing practices.
- Undertaken by individual fishing household (as opposed to commercial fishing).
- Usually their produce is not processed any and is mainly for local consumption.
- It is often less wasteful and less stressful on fish population than modern industrial fishing.
- Not only source of food and nutrition security, also a source of income.
- Mainly SSF is self-employed and usually provide fish for direct consumption.
- In Nepali it can be term as “साना-मत्स्यकी” or “Sana-Matsyaki”

Small Scale Fisheries (SSF) in Nepal:

- Concept of small scale fisheries is rarely explicitly defined. Conceptualization of scale depends very much on context. For e.g. fishing boat that would be considered small in one place could be considered large scale in another.
- According to Gurung (2023) small-scale fisheries (SSF) in Nepal is “an outdoor subsistence fishing and gathering of other aquatic organisms for food, nutrition and livelihood in rivers, streams, tributaries, swamps, lakes, wetlands, ditches, ponds, rice fields etc.
- According to IUCN (2004) shown that about 10.8% of the total population involved in SSF represent 13 different ethnic community and most of them are landless and women.
- Small scale fisheries is most more significant than more people realize. It is more widespread and crucial to food and nutrition security and employment.
- The data on actual fishers and dependents are required to be updated in the country and in provinces. However, our tentative estimate shows that SSF provide employment to nearly 3.8 lakhs people, may be highest in Koshi Pradesh.
- Based on this, Nepal can also stand that SSF is “Too Big to Ignore”.

Feature of SSF in Nepal

- Involvement of native fishers group like Majhi, Mallah, Bote, Danuwar and other ethnic group.(Men in fishing and women mostly on marketing and post-harvest processing.)
- Contribute around 20% to total fish production (CFPCC,2023).
- Mostly no boats or wooden planks boat are used.
- Use of cast net, short gill net, angling, long handle scoop net, hand net, basket, trap and diversion of flow.
- The crew is small (1 to 5 people).
- Direct sales to consumer or other hotel and restaurants.
- Individual catches of low volume but of relatively higher value (Asala, Sahar).
- The number of women exceeds than the man in small-scale fisheries sector. (around 59% are women) (NJAF,2020)
- Act as medium of social justice.(include women, marginalized and deprived community)

Some basic facts about the SSF communities in Nepal

- According to IUCN (2004) shown that about 10.8% of the total population involved in SSF represent 13 different ethnic community and most of them are landless and women.
- SSF communities of Nepal are harvesters or hunters or gatherers (especially women) of aquatic plants, fish, prawn, crabs, and snails in Nepal.
- They are conscious for their survival for generation, thus are conservationist too.
- All SSF communities are highly subsistence type and not profit makers.
- In general, the traditional SSF communities never involved in poisoning of the wetland, use of explosive for fishing. Thus, mostly it is other outsiders who used the insecticides, pesticides and other forms of poison and use explosive for fish killing in Nepal.
- In present context of climate change, poor NRM, and social order, “SSF communities are the most vulnerable, threatened and endangered communities in Nepal”.

Some Issues of SSF in Nepal: Weak Governance

- Sustainability of the SSF due to overuse, misuse and illegal use. (Explosion, electrofishing, poisoning, unusual fishing activities, Open access etc)
- Construction of Dam, reservoir irrespective of aquatic ecology and without provisions of fish ladder and other management practices.
- Threaten of climate change (influence on migration pattern, feeding, breeding etc).
- Weak institutions and management system (coordination, awareness)
- Poor enforcement of Act, regulation (Aquatic Animal Protection Act 2017 B.S)

Why SSF is important more in Nepal?

- It involve mostly ultra-marginalized, low income, landless and minor ethnic communities especially women. SSF governance could be the gateway to support food and nutrition security of highly marginalized ethnic communities especially women.
- The small-scale fisheries matters much for Nepal, as the country does not share the oceanic boundaries.
- SSF has created new job opportunities for local people, particularly women and youth.
- Small-scale fish farmers can use sustainable practices, such as the use of natural feed and the implementation of water management techniques, to minimize the environmental impact of their operations.
- SSF product (finfish, shellfish and aquatic plants such as water chest nut and makhana) often considered as one of the cheapest sources of protein, vitamin and minerals diet.
- SSF products are not only the sources of nutrition and food to those marginalized ethnic groups, but the unquestionable and most acceptable food sources to all Nepalese regardless of age, gender, religion, ethnicity and race etc.
- Despite of such importance the per capita consumption is far below, nearly 4.5 Kg/per/year suggesting the small-scale fisheries has to grow and contribute more in near future.

Some small-scale aquaculture that are being practiced in Nepal.

1. Pond Culture:

- Pond aquaculture practice is being increased in Nepal with more than 10% growth rate.
- Nepal has 13,875 ha pond area and many of them are small scale aquaculture.

- More than 80% farmers in mid-hills are involved in small scale aquaculture practice.
2. Rice fish farming:
- Rice fish farming is done in 49 ha with 17 M. ton fish production.
 - Mid-hills of Nepal are the major area for rice fish farming.
3. Cage fish farming:
- 313 M. ton fish is being produced in 73,803 m³ cage
 - Fewa, Rupa, Begnash lakes and Kulekhani and kaligandaki reservoir are majorly used for cage fish farming in Nepal.
 - Private and community based cage culture is being practiced.
4. Enclosure Fish farming:
- 53 M. ton fish is being produced in 40 ha.
 - Practiced in Rupa, Begnash lakes.
5. Integrated fish farming:
- Integration of horticulture crops and livestock's are common practice in Nepal.

Some practices of Small Scale Aquaculture in Nepal National Fisheries Development policy 2079: A policy framework for promoting SSF

Clause no-9.2 Emphasis will be given on commercialization of traditional fisher group/ community by providing appropriate technology.

Strategies:

Clause no-9.2.1 To increase the income level of traditional fisher group, access to appropriate technologies will be increased.

Clause no-9.2.2 The dependent communities in the same water area will be encouraged to cages culture and enclosures fish farming. Arrangements will be made to produce quality fish seed at the local level.

Clause no-9.2.3 Arrangements will be made to increase their capacity for proper use of water and land in order to achieve more returns from fish farming and fisheries.

Clause no-9.2.4 By organizing the fishers' communities, marketing structures will be built and efficiency will be enhanced, this profession will be transformed into a profitable business.

Clause no-9.12 Protection, promotion and appropriate use of aquatic biodiversity, habitats and local aquatic organisms will be managed through the participation of local communities while protecting the interests of communities dependent on fish.

Strategies:

Clause no-9.12.1 Active participation of Fisher communities in the management of fisheries resources will be promoted.

Clause no-9.12.2 Open water resources will be managed by co-management.

Clause no-9.12.3 To increase the stock of local fish and maintain aquatic biological diversity, the natural biological system will be protected.

Clause no-9.12.4 Endemic fish species will be identified and protected, promoted, managed and developed in a balanced manner.

Clause no-9.12.6 The fish stocks will be increased by ranching and fish stocks of local endangered species will be increased by establishing, protecting and promoting habitats for fish genetic conservation.

Clause no-9.12.7 The work related to the rehabilitation of fish dependent families who are displaced due to dams, reservoirs and other physical constructions will be done in a planned way before the construction work.

Clause no-9.12.8 Traditional knowledge and skills of the local community will be protected, as well as the protection and sharing of benefits of traditional knowledge related to genetic resources will be ensured.

Clause no-9.12.9 Training and awareness campaign will conducted about the importance of local fish and the appropriate size of fish to be caught (catch size), time and breeding ground.

Clause no-9.12.10 Gene banks and ex situ (ex situ) conservation will be encouraged for the genetic conservation of local breeds of fish in Nepal.

Clause no-9.12.11 A code of conduct for responsible fishing related to specific local resources will be prepared and implemented.

Table: Estimated Area of small scale fisheries in Nepal

Aquatic Resources	Estimated Area (ha)	Percent coverage
Rivers	395000.00	47.77
Lakes	5000 0.60	
Reservoirs	1500 0.18	
Marshy lands	12500.00	1.51
Village ponds	13875.00	1.54
Rice field	398000.00	48.14
Total	829276.00	100.00

Source: CFPCC, 2021)

Trend of small-scale fisheries in Nepal

- Since last 3 decades the production from captured fisheries where most of the SSF communities involved are actually stagnant without much change.
- Institutional set up is major constraints.
- Therefore it is essential to consider the involving communities for the food security and employment issues.

Gender issues on SSF

- Men are involved mostly on fishing but women's are involved in processing and marketing. They also do fishing in shallow ditches or water bodies. (Jalari women contribution in marketing was higher 78% than fishing/harvesting 27% in Phewalake (Nepal, 2007)
- Women's role in household food security and nutrition security is high but not recognized. Why?
- Low participation of women in decision making. Why?
- For same work, Women labor are paid low compared to male and contribution of women is not count economically. .
- Exist gender gap in Fisheries activities in Nepal.

How to make their role visible/highlight?

- Gender awareness/sensitization
- financial empowerment (Soft loan, focused program, women cooperative based program)
- Gender equity
- Gender equality: equal payment, participation.
- Needs government policies to encourage women's involvement in fisheries.
- Strict/effective implementation of policy of 33% women participation in all decision making process/committees.

Some Intervention in SSF Governance in Nepal

- Recognition of SSF as integrated social-ecological systems in mountains, hills and Terai.
- Small-scale fisheries communities based management of wetlands and rivers.
- Co-management system of wetlands and rivers.
- Group/ Cooperative (effective in marketing and conservation)
- Participatory decision making (women/traditional fisher group)
- Utilization of Value chain approaches in Marketing of SSF (Dried, salted, smoked, fresh etc)

Role of government to promote SSF in Nepal:

- Identifying the potential area for SSF.
- Creating awareness program for the conservation of water resources and importance of SSF for livelihood and employment generation.
- Identifying suitable aquatic species for natural water resources/ diversification of SSF according to species, seasons
- Program to be implemented to unutilized and underutilized water resources.
- Co-management approaches for sustainable utilization of water resources.
- Creation of alternative livelihood opportunity for SSF.
- Increase women's participation in decision making.

Conclusion:

- SSF plays important role in food and nutrition security of highly deprived, marginalized community creating employment to around 3.8 lakhs people.
- Considering available water resource and climate suitability of Country, investment in SSF act as medium for social, regional and gender equity. So area of investment in SSF should be explored.
- SSF in Nepal is Too big to Ignore but SSF sector is more vulnerable one requiring immediate action.
- To address the issue of SSF in Nepal, a strong institutional set up with robust policy and regulation, coordination and technical expertise are required. So SSF governance should be promoted.
- An actions should be taken to implement the FAO's voluntary guidelines of SSF (Responsible governance of tenure, sustainable resource management, employment and decent work, value chain, post-harvest and trade, gender equality, disaster risk and climate change, human right

based approaches, food and nutrition security) in Nepal. To implement the FAO's voluntary guidelines for SSF governance, cooperation with TBTI would be the best option.

Impact of the Cross Dam on Aquatic Biodiversity

Presented by: Deep Bahadur Swar, Ph.D.

Presentation:

- ❖ DAM in THE RIVERS of Nepal
- ❖ AQUATIC RESOURCES (Fish)
- ❖ CASE STUDIES OF SOME SELECTED DAMS FOR MEASURES TO PROTECT FISH SPECIES AND POPULATION
- ❖ IDENTIFICATION OF IMPACT OF DAM ON FISH
- ❖ TYPICAL Mitigation measures and international best practices
- ❖ Conclusion and Recommendation

Scope and Limitation of the Study:

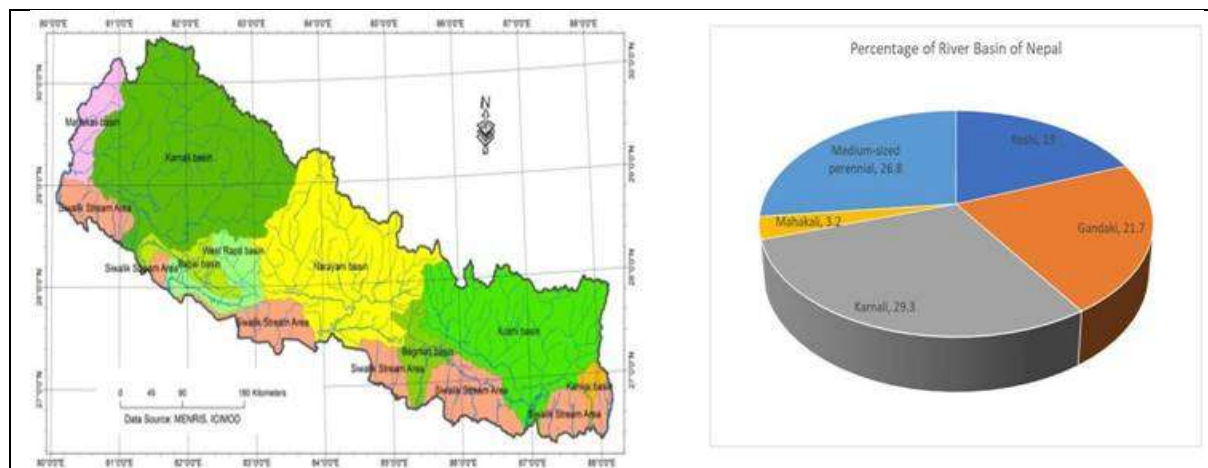
- ❖ Rapid study based on few cases studies
- ❖ Addresses the impact of dam on fish and identify protection measures in future projects

Study Methodology:

- ❖ Case study
- ❖ Rapid investigation of changes in fish population after dam
- ❖ Interconnected river basins- lifecycle movement routes
- ❖ Existing aquatic biodiversity management approaches and their effectiveness
- ❖ Compliance with mitigation measures and lesson learned
- ❖ Recommendations- Generic and Country-specific

Major River Systems of Nepal

There are 33 rivers, whose drainage area exceeds 1000km². Nepal is drained by four major Himalayan River systems, namely Koshi, Gandaki, Karnali and Mahakali. Karnali has the largest catchment area, which is followed by Gandaki (21.7%) and Koshi (19%). Mahakali, which flows along the Nepal-India boarder, covers 3.2% of the country's area.



River system in Nepal

Lakes

Besides the rivers, a number of medium and small sized lakes are scattered throughout the country ranging from freezing zone to sub-tropical Terai area. Lakes located in the high mountain are glacial in origin. They are poorly inhabited with aquatic life. Among the high altitude lakes, fish fauna are reported only from Rara Lake. Other lakes such as Tilicho in Manang; Gosainkund in Rasuwa, SheyPhoksumdo in Dolpa are considered oligotrophic. Out of midhill lakes, the tectonic lakes of Pokhara Valley (Phewa, Begnas, Rupa, Depang, Khaste) are considered mesotrophic and provide habitats for several fish species. In addition to lakes in high altitude and mid hills, many ox-bow lakes are scattered throughout Terai plain of the country. These lakes (Badhaiyatal, Banda tal, Purainatal, Gaidhawatal) are eutrophic in nature and inhabited with several species warm water fish and several invertebrates.

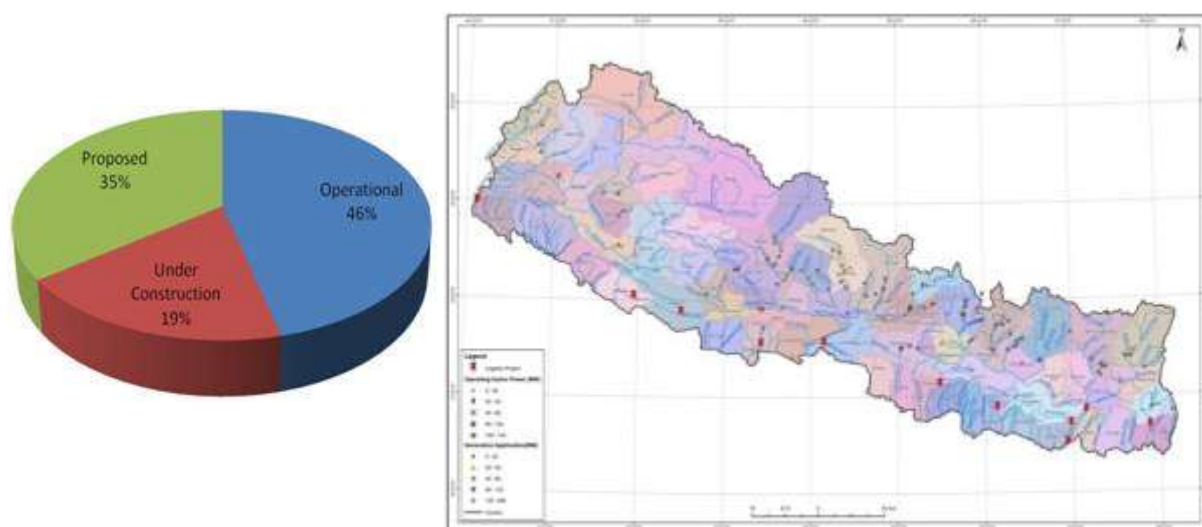
Dam Formation

Dams are constructed across rivers to store and control vast quantities of water so that it can be used for different purposes. Formation of dam over river or lake is probably the most popular method of water management. It has additional advantages that can be utilized for different purposes. Some dams serve only one or a few of these purposes, but most modern dams serve several and therefore are called multipurpose dams. According to Lecornu (1998) the main fish dams are divided into the following types:

- Hydroelectric dams
- Irrigation dams
- Recreation dams
- Domestic and industrial water supply dams
- Fish breeding dams and
- Navigation dams

Hydropower Dams

Above 200 cross dam hydropower projects are in operation (46%), under construction (19%) and in pipeline (19%) with the involvement of public and private sector in Nepal.



Dam in HDP Projects Nepal Location of Dams in different Rivers of Nepal

Irrigation Dams:

Mainly the dams are constructed for hydropower generation, but also There are about a dozen dams are for irrigation in Nepal. The dams over river or lake outlets are scattered throughout the country. List of prominent cross dam irrigation project in Nepal are presented below.

SN	Irrigation project	River/Lake	District	Irrigated land(ha)
1	Sharada	Mahakali	Kanchanpur	6800
2	Rani Jamara (under construction)	Karnali	Kailali	26000
3	Babai	Babai	Bardiya	13,600
4	Sikta (under construction)	Rapti	Banke	36,000
5	Ban Ganga	BanGanga	Kapilvastu	8,000
6.	Gandak	Narayani	Bara, Parsa, Rauthat, NawalParasi	51000
7	Eastern Rapti	E. Rapti	Chitwan	56,000
8	Bagmati Multipurpose	Bagmati	Bara, Rautahat, Sarlahi	50,200
9	Kamala	Kamala	Dhanusa	
10	Chandra Nahar	Trijuga	Saptari	
11	Koshi	Koshi	Saptari	22000
12	Sunsari	Koshi	Sunsari, Moranr	58000
13	Kankai	Kankai	Jhapa	8000

Aquatic Resources

Fish Faunal Diversity

The faunal diversity of Nepalese wetlands includes 252 species of freshwater fish, 1002 species of phytoplankton, 109 species of zooplanktons, 192 species of mollusks and 52 species of amphibians. But very little information exists about the aquatic invertebrates.

Endemic Fish Species

Sixteen fish species of fresh water fish are endemic to Nepal, which are given below Table. Three endemic species of *Schizothorachthys* are located in Rara lake, which is the protected area. But rest thirteen species are distributed in different rivers in mid hills and Terai.

Table: Fish species of fresh water fish

S.N	Fish Species	Author	Year	Water body/Location
1	<i>Myersglanisblythii</i> (Day)	Jayaram	1991	Pharping, Kathmandu Valley
2	<i>PsilorhynchusPseudechenies</i>	Menon&Datta	1962	River Dudh Koshi
3	<i>P.nepalensis</i> sp.nov	Conway &Mayden	2008	River Rapti, River Seti
4	<i>Pseudeutropiusmurius</i> batarensis	Shrestha	1981	Batar, Trushuli
5	<i>Schizothoraichthysmacrophthalmus</i>	Tarashima	1984	Mahendra (Rara) Lake
6	<i>S.nepalensis</i>	Tarashima	1984	Mahendra (Rara) Lake
7	<i>S.raraensis</i>	Tarashima	1984	Mahendra (Rara) Lake
8	<i>Batasiomacronotus</i> sp. Nov.	Ng &Edds	2005	River Sapta Koshi
9	<i>Pseudecheneiscrossicaudata</i> sp. Nov	Ng &Edds	2005	Mewa Khola (River Tamor)
10	<i>P.serracula</i> sp. Nov.	Ng &Edds	2005	Seti, Kali Gandaki, Narayani, Mahakali & Karnali River
11	<i>P. eddsi</i> sp. Nov	Ng	2006	Mahesh Khola(R. Trishuli)
12	<i>Erethistoidesascita</i> sp. Nov.	Ng &Edds	2005	Mechi, Kankai, Trijuga and Koshi River
13	<i>E. cavatura</i> sp. Nov.	Ng &Edds	2005	Dhungra Khola, River Rapti and Narayani
14	<i>Balitoraeddsi</i> sp. Nov.	Conway &Mayden	2010	River Karnali
15	<i>Neoanguillanepalensis</i> sp. Nov.	Shrestha	2008	Chitwan
16	<i>Turchinoemacheilushimalaya</i> sp.Nov.	Conway, Edds, Shrestha&Mayden	2011	Indrawati, Koshi, Kali Gandaki and Narayani River

Migratory Fish species

There are some long distance and short distance migratory fish species in river system of Nepal.

Short distance migratory fish species

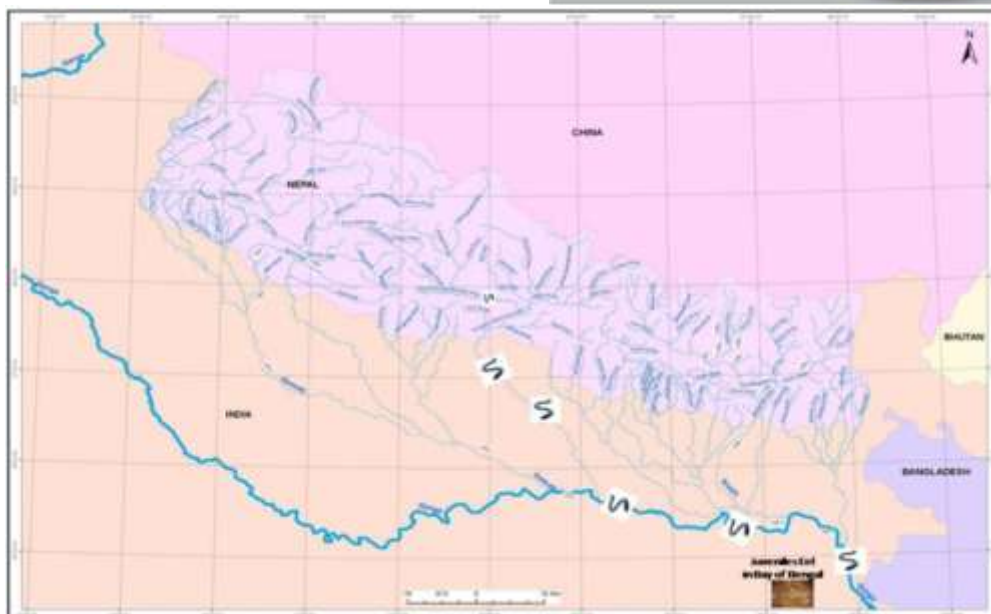
- 1 *Amphipnouscuchia*
- 2 *Chaguniuschagunio*
- 3 *Labeoangra*
- 4 *Labeoboga*
- 5 *Labeodero*
- 6 *Labeopangusia*
- 7 *Labeorohita*
- 8 *Neolissochilus*hexagonolepis
- 9 *Puntiuschilinoides*
- 10 *Schizothoraichthys*progastus
- 11 *Schizothorax*plagiostomus
- 12 *Schizothorax*richardsoni

Long distance migratory fish species

- 1 *Anguilla* bangalensis
- 2 *Bagarius*bagarius
- 3 *Bagarius*yarrellii
- 4 *Clupisoma*gaura
- 5 *Ompok*bimaculatus
- 6 *Pseudeutropius*antherinids
- 7 *Tor* putitora
- 8 *Tor* tor

General behavior of migratory fishes

Species	Migratory Patron Months												Spawning Season	Behaviour
	J	F	M	A	M	J	J	A	S	O	N	D		
<i>Tor putitora</i> (Golden Mahaseer)						↑	↑	↑	↑	↓	↓	↓	Aug.-Sept.	Rest in deep pools excellent game fish attracted with yellow bait fruit. Jumping during morning & evening in search of food.
<i>Tor tor</i> (Sahar)					↑	↑	↑	↑	↑	↓	↓	↓	Aug.-Sept.	
<i>Bagarius bagarius</i> (Gonch)			↑	↑	↑	↑	↑	↑	↑	↓	↓	↓	July-August	Rest in deep pools excellent game fish attracted with yellow bait fruit. Jumping during morning & evening in search of food.
<i>Clupisomagaura</i> (Jalkapoor)			↑	↑	↑	↑	↑	↓	↓	↓			June-July	
<i>Anguilla bangalensis</i> (Raj Bam)		↑	↑	↑	↑	↓	↓	↓					-	Lives together with <i>Labeodero</i> excellent game fish (rod and line) in yellow bait, colour pattern change after death.



Migration Route of Long Distance Migratory Fish (*Tor putitora* and *Anguilla bangalensis*)

Case Study of Some Selected Dams

Kali Gandaki A Hydropower Project (KGA):

The KGA project is located 500 m below the confluence of the Kaligandaki and Andhikhola at Mirmai. The river flows west, turns south and east to form a 50 km loop and reaches the powerhouse site at Beltari. A 44 m high by 110 m long concrete diversion dam has created a reservoir of 65 ha stretching 5.3 km, with an average depth of 12 m and operating level between 518-524 m. From the de sanding basin at the head works site, water low in sediments is routed into a 5.9 km tunnel and enter a power plant equipped with surge tank, pressure shaft, three power units, transformer, draft tube gate and a tail race where it is released back into the river.



Fisheries Resources:

The Kali Gandaki River has a number of fish species adapted to extreme gradient. The fish support subsistence, commercial and sport fisheries. The annual catch from the river is estimated at between 80 to 150 tons. The principal species are snow trouts, mahseer, carps, catfish, eel, murrel, loach and barbs. Feasibility studies recorded 57 species within the project area. These fish have adapted to the extreme flow and turbidity. Migration patterns include long distance (to and from Terai or Bay of Bengal); medium distance, and residents (moving from the main stream to immediate tributaries). Upstream migration starts at the beginning of monsoon which triggers spawning behavior, and downstream migration starts when water levels in the tributaries subsides. The catadromous eel is also abundant in the Kali Gandaki River. Summary of the potential impact of KGA project on fisheries and their mitigation measures are presented below.

Impact	Mitigation Measures	Purpose	Targeted population
Upstream barrier	Trapping and hauling	Facilitate upstream fish passage	In-migrating fish
Entrainment	Trash rack; grating of collector channel/louver; downstream migrant release facility	Facilitate downstream fish passage	Out-migrating fish
Dewatering of Kali Gandaki loop	Minimal in-stream flows (4m ³ /sec)	Protect aquatic and riparian habitat between diversion dam and powerhouse	All fish
Incidental fisheries impact	Fish Hatchery	Supplementation of existing fish stocks	Mahseer, copper Mahseer, snow trout, Jalkapoor and eel.



Catchment of fish



Fish Ladder in Aandhi Khola



A group of people using electric fishing

The following recommendations were made to mitigate the adverse effect of the dam on fish fauna in Kaligandaki hydropower project area.

- Establishment and operation of multispecies fish hatchery and release of fish fingerlings in the upstream and downstream of the dam.
- Ensure fish migration both upstream and downstream through fish trapping and hauling activity with the involvement of local fisher's community.
- Ensure the implementation of Aquatic animal protection act.
- Restriction on fishing activities between dam site to the confluence of Rudrabeni.
- Ensure the 4m³/sec of water in the dry season.
- Restrict the pollution of river.
- Literature review and field observation reveal as follow.

Middle Marshyangdi Hydroelectric Project (MMHEP):

Marshyangdiriver was dammed at PhaliaSangu and water is diverted through a tunnel to Bhotewadar/Shiudibar to produce hydroelectricity. The tail water is released into the main river where electricity is being generated. The cross dam has no provision of fish pass/ladder. There is hardly any water in downstream of the dam up to the confluence of DordiKhola during nine months in a year. Dordi is a spring fed stream. There are several small power projects proposed in Dordi but the actual construction has not started yet. The length of the river stretch between dam site and powerhouse is about 5.7 km. Dordikhola (khola-stream) Joins River after 3 km from the dam site. Our fishing effort below the powerhouse site revealed that there are plenty of bucheasala in the river. But other species were not caught. River flow is governed by two different seasons through the year producing quite different flow condition. During the dry season comprising generally the months of November to April, precipitation and out flow of catchment area is low and the river discharge passes its yearly minimum. Sediment transport both suspended load and bed load, is of secondary importance within this period. On contrary, during the monsoon season comprising generally the month of June to September, the meteorological change provides heavy rainfalls combined with important snow melt in the mountain region of the catchment area. These conditions produce an increased river discharge combined with high sediment transport rates and also important flood events.

Fishing in the river Marshyangdi and its tributaries in being carried out without ant restriction and regulation. Local fishers expressed their dissatisfaction on the illegal fishing (poisoning, electro fishing etc). Sand and stone mining is very common at different parts of the river. MMHEP has created adverse conditions for the aquatic animals:

- a) Three kilometer of river stretch is almost dry for about nine month.
- b) Migration of fish in through the dam is completely restricted.
- c) Natural habitat has been destructed due to sand/stone mining.
- d) There is no restriction on fishing (despite a signboard of no fishing in front of the powerhouse).



Middle Marshyadi Hydroelectric Project

Marshyangdi Hydroelectricity Project:

This is the first hydropower project on Marshyangdiriver. The power house is located at Abukhaireni VDC, Ward no 8. Tanahun. Lower Marshyangdi has no provision of fish pass. Eight and half kilometer downstream is almost dry throughout 9 months. There is no proposed plan for mitigating the adverse impact of dam under this project. Daraundi joins the dry stretch of the river at Abunkhaireni. Tail race water will join the river after 3km from the Abunkhaireni.

In addition, the above two dams third dam is under construction at the border area of Lumjung and Manang. This is also a run of the river type power project without any provision of fish ladder. Adverse effect of this cross dam is evident. The power house of Chino Hydropower is located at

Simalchour. Khudikhola joins the river Marshyangdi at Simalchour. Sagarmatha Hydropower co. is planning to construct a hydropower project in Manang District.



Reservoir of Marshyangdi Hp. Project:



Fish survey at powerhouse site revealed that snow trouts are available

Babai Irrigation Project

The Babai River rises in the Dang Valley and runs through to India where it is known as the Rardar. The watershed is 3,260 km² and the river is notable as a warm water river in contrast to the majority of rivers in Nepal that are snow fed. The Dang Valley has a population of 250,000 primarily involved in agriculture and the Dang people are essentially hill people. Below the dam in lowland areas, the Tharu are the predominant tribe though there has been some mixing.

The Babai dam, which was completed and functioning in October 1993, was constructed for irrigation purposes to improve the productivity of the farming land in the surrounding lower lying terai.

Status of Fish Population

33 fish species were recorded in Babai River during 1999 (Shrestha 1999)

Principle fish species of Babai River were:

- ✓ Major carps: River carp (*Labeodyochailus*, *Labeodero*), Sucker had (*Garagotaila*), *Garraannandallei*), Katle (*Neolissochilus hexagonolopis*).
- ✓ Cat Fish: Goanch (*Bagarius bagarius*)
- ✓ Loaches: (*Neomachelous armatus*)
- ✓ Eels: Sping eel *Mastacembelus armatus*, Raj Bam (*Anguliabeengalensis*)
- ✓ Murrells: Snakehead (*Channapunctatus*)
- ✓ Mahaseer: Golden Mahaseer (*Tor putitora*), Sahar (*Tor tor*)
- ✓ Minnows: *Bariliusbarna*, *Bariliusbendalensis* and *Bariliusvagra*



Available fish in survey period

Kulekhani Reservoir:



Fish Ladder in Babai Irrigation

The Kulekhani Reservoir was formed in 1981 by the construction of a dam (height 114 m) on the kulekhani River. This reservoir serves as a water storage basin for hydroelectric power. The filling of the reservoir started in June, 1981, but the peak water level (100.1 m) was reached only in November, 1983. Since then, the annual drawdown has resulted in water level fluctuation between 17 and 46 m below the peak level.

Katle, *Neolissochilus hexagonolepis*, was the dominant species in the reservoir. The mean percentage by weight and number of katle in the total catch for the whole period of 1985 to 1989 was 69.35% and 49.9% respectively. Karange, *Puntius chinoides*, was the second most dominant species, comprising 22.05% by weight and 44.2% by number of the total catch throughout the study period. Asala, *schizothorax richardsoni*, the dominant species by number in the pre-impounded river, formed a very small part of gill net catches in the reservoir, never more than 2% by weight and 6% by number throughout the study period (Swar, 1992). A profound change in the relative abundance of many species occurred within a short time of the lake's formation (Swar, 1992; 1994). This included:

- Drastic decline in the number of snow trout *Schizothorax richardsoni*; and
- The disappearance of *puntius spp.*, *G. lamta*, *Noemacheilus spp.*, *C. gachua*, *Glyptosternum spp.* And *Coraglanis spp.*
- Two indigenous species, *Neolissochilus hexagonolepis* and *Puntius chinoides* remained dominant.
- Three species *Hypophthalmichthys molitrix*, silver carp; *Aristichthys nobilis*, bighead carp and *Tor tor*, mahseer which were not native to the Kulekhani River, appeared in the catches of 1986/87.



Kulekhani Dam



Cage fish culture in Kulekhani Reservoir

Comparative Study

S N	Name of the project	Committed mitigative measure	Current practice	Remarks
1	Kali-Gandaki A	1. Trapping and hauling 2. Fish hatchery 3. Minimal in-stream flow (4m ³ /s) 4. Trash rack	All complied. Fish hatchery: 8 species	Reduction in fish population. Mainly migratory fish have declined
2	Middle Marsyangdi	1. Fish hatchery 2. Minimal flow (1m ³ /S) 3. Entrainment	No mitigative measures adopted	Stocking of 50,000 fish fries produced at Kaligandaki fish hatchery
3	Kulekhani I	No EIA	No mitigative	Downstream is

S N	Name of the project	Committed mitigative measure	Current practice	Remarks
			measures	permanently dry except during flooding period
4	Babai irrigation project	No EIA	1. Fish ladder 2. Water release (1m ³ /S) during dry season	Last three pools of fish ladder are silted
5	Tinau	No EIA	No fish pass facility	
6	Trishuli Hydropower	No EIA	No fish pass facility	
7	Sikta irrigation project (under construction)	EIA	Fish Ladder	
8	Phewa Hydro/irrigation project		No fish pass facility	Stocking of fish fries annually
9	Tanahun Hydro (proposed) (Storage)- ADB Supported	1. Fish hatchery 2. Minimal flow (2.4m ³ /s) 3. Trash rack 4. Fish habitat management		
10	Khimti Hydropower	1. Ladder 2. Stocking of important species	No fish ladder	
11	DudhKoshi Hydropower Storage type (proposed with ADB support)	Establishment of fish hatchery in project area		
12	Upper Karnali (Proposed) run-off the river	Establishment of fish hatchery in project area	Pool and weir type Fish ladder	

Impact of Dam on Fish

- ❖ blockage in fish movement
- ❖ dry D/S stretch of river destroying entire river ecosystem
- ❖ water quality deterioration
- ❖ physical injury- Juveniles are attracted towards penstock
- ❖ predation
- ❖ destructive fishing

Mitigative Measures and their effectiveness and Efficiency

Most of dams installed in the past do not have fish passage facilities that obstruct and prevent upstream and downstream fish migration and have a major impact on fisheries. Now it is universally mandatory to provide mitigation measures by dam projects but there is still a question mark on their effectiveness and efficiency. However, Implementation of environmental impact assessment (EIA) has been a positive step towards environment protection. Various mitigation options have been recommended by such studies to maintain river connectivity and preserve fisheries diversity. A summary of advantages and limitations of different mitigation measures is presented below.

Advantages and limitations of different mitigation measures

Measures -1 Pool type fish passage

Advantages:	<ul style="list-style-type: none"> • Height that has to be crossed by fish is divided into several small drops forming a series of pools • Provides resting zone for fish and ensure adequate energy dissipation of water. • The entire water column is available. This accommodates a wider variety of species both surface and bottom movers.
Limitations:	<ul style="list-style-type: none"> • It requires more water to operate • Regular cleaning is required to avoid blockage of the passage
Remarks:	<ul style="list-style-type: none"> • Should be located at appropriate position • Mainly for small and medium size stream with Dam height less than 10 m.

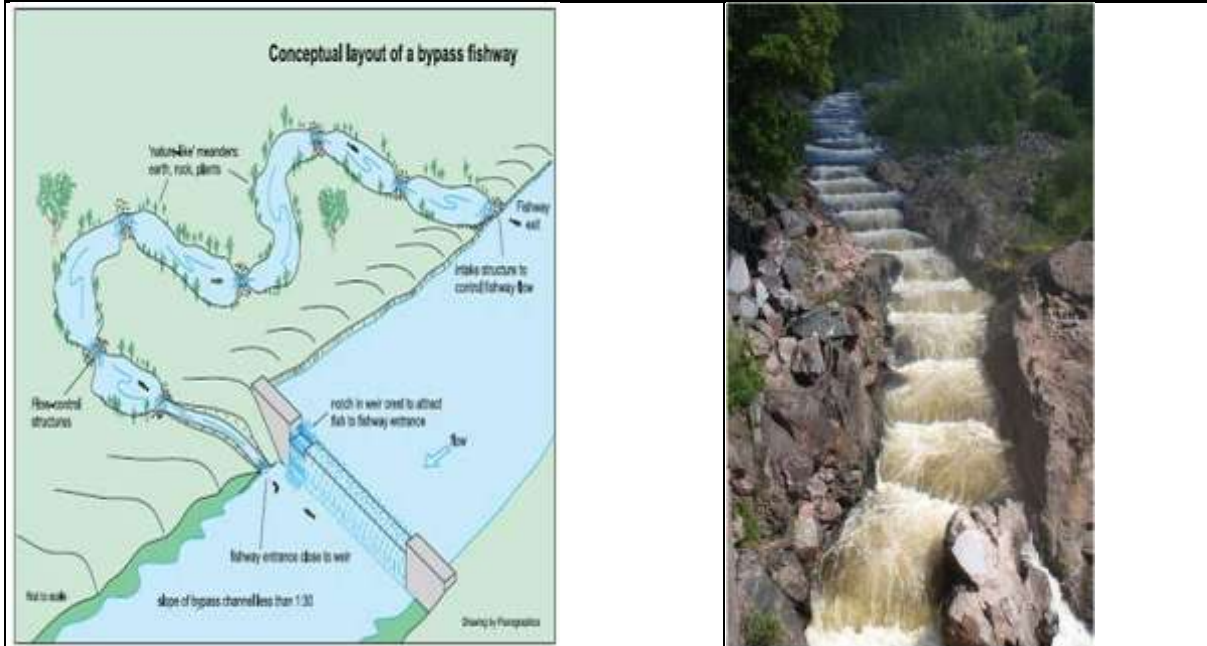


Measures -2 Denil Fish Passage

Advantages:	<ul style="list-style-type: none"> • It can be prefabricated that makes it more economical to install • This type of installation causes less site disturbance 	
Limitations:	<ul style="list-style-type: none"> • No resting zone for fish, they must pass without stopping • Only stronger species can swim up. Many species and weak swimmers cannot ascend the ladder and loose access to upstream habitat. 	
Remarks:	<ul style="list-style-type: none"> • It can be improved by creating larger pools to break water current and give resting place 	

Measures -3 Natural like by-pass channel

Advantages:	<ul style="list-style-type: none"> • All aquatic species including fish can use this channel • Enhance the beauty of the landscape • provides natural environment
Limitations:	<ul style="list-style-type: none"> • The main disadvantage of such channel is that it needs considerable space in the vicinity of the obstacle • Cannot be adapted to significant variation in upstream level without special devices (gates, sluices). These control devices may cause hydraulic conditions that make fish passage difficult
Remarks:	<ul style="list-style-type: none"> • The fish entrance to the artificial river be located as close to the obstruction as possible • Effective only of low slope




Measures -4 Collection and Transportation Facilities

Advantages:	<ul style="list-style-type: none"> • The technique is often used as a transitory measure before upstream fish facilities are constructed. • Useful where the construction of a pass would be difficult or in the case of a series of dams where one dam is close to the next. • Local manpower can be used
Limitations:	<ul style="list-style-type: none"> • This method is labor intensive • Stressful to fish which increases their mortality. • May encourage poaching
Remarks:	<ul style="list-style-type: none"> • Careful handling of fish is required to avoid fish injury • Close observation is required Effective only of low slope

Measures -5 Fish Lifts

Advantages:	<ul style="list-style-type: none"> • Construction cost is practically independent of the height of the dam • little space needed to install • Low sensitivity to variations in the upstream water level.
Limitations:	<ul style="list-style-type: none"> • The main disadvantages lie in the higher cost of operation and maintenance. • The efficiency of lifts for small individuals is generally low because sufficiently fine screens cannot be used for operational reasons
Remarks:	<ul style="list-style-type: none"> • Effective for high dams • Expensive very small passage rate

Measures -6 Fish hatcheries

Advantages:	<ul style="list-style-type: none">• Important indigenous species can be breed stocked for conservation• Provides seed to farmers in the project area for fish culture
Limitations:	<ul style="list-style-type: none">• Practically not possible to produce all important species• High development and operation cost
Remarks:	<ul style="list-style-type: none">• Breeding techniques of indigenous species should be developed
	

Measures -7 Catch and Haul

Advantages:	<ul style="list-style-type: none">• Useful where the construction of a pass would be difficult• Series of dams where one dam is close to the next.• Local fishermen get job
Limitations:	<ul style="list-style-type: none">• This method is labor intensive• Stressful to fish which increases their mortality.• May encourage poaching
Remarks:	<ul style="list-style-type: none">• Careful handling of fish is required to avoid fish injury• Close observation is required

Measures -8 Others

- ❖ Improvement of spawning ground (incubation channel)
 - protect the spawning and nursery grounds
 - deposit gravel to maintain the spawning habitat
 - place shingle and boulders on bottom to create water pools
 - Make D/S channel with defined water during lean season
- ❖ Stringent Monitoring
 - restrict destructive fishing
 - aware and involve community for protection
 - compensate community for protecting the biodiversity
- ❖ Declare Aquatic Conservation Area for rivers rich in rare and endangered fish species

Conclusion and Recommendation

Policy and Legal Provision:

- ❖ Update the Aquatic Animal Protection Act 1961 and prepare Regulation as per Federal Structure
- ❖ Recognize inland water bodies as the primary source and habitat of aquatic biodiversity
- ❖ Formulate guidelines for Screening, Mitigating and Compensatory measures for protecting aquatic biodiversity
- ❖ Prepare a **Fish Screening Checklist** and associated scoring system and make it integral part of Environment Protection Regulation and EIA/IEE process

Governance:

- ❖ Establish Environmental monitoring unit in each local body
- ❖ Control mining of gravel and sand from river bed
- ❖ Stringently control industrial waste and pollution discharge in water bodies
- ❖ Monitor and restrict unsustainable and destructive fishing
- ❖ Mobilize communities and organize public awareness program against destructive fishing
- ❖ Promote “Payment for Ecosystem Services” mechanism to attract community in collective conservation effort

National Plan & Strategy:

- Conduct Strategic Environmental Assessment (SEA) of IWRM and Hydropower Policy
- Declare few tributaries of river basins as conservation area
- Develop plan for maintaining unhindered north south and transboundary biological connectivity in major river system

Technology:

- Study, use international best practices and design appropriate fish passes suitable in the context of Nepal

Research & Studies:

- ❖ Conduct a nationwide survey of rivers and prepare an inventory on the fish fauna
- ❖ Prepare migratory route map with cumulative analysis on location of dams and their overall impact on fish movement
- ❖ Assess the efficiency of different fish passage in Nepalese dams and prepare a manual for identifying right type of passage

A case from Koshi River Basin, Koshi Tappu Wildlife Reserve

Prepared and Presented by: Nelson Pokharel, Tek Bahadur Gurung

The prime fishing community in the study area are Malaha, Bahardar, mukhiya, Sahani belonging to ethnic fisher community. The Koshi Barrage linking Saptari and Sunsari districts controls the water flow of the largest river of Nepal. The areas nearby have been termed here as Koshi barrage area. Among all, probably SSF around Koshi Barrage is most rewarding, as Koshi River is biggest rivers of Nepal comprising of seven big rivers and hundreds of tributaries covers a huge area. There have been very few studies on SSF, fishing gears and fishing method adopted around the Koshi Barrage areas. The fisher community are basically involved in fishing, boating, fish harvesting and marketing as well. This area is being used to fulfill the demand of animal protein to people for food security and income generation to the deprived community. The study area covers riverine flood plains (KoshiKatan, this place is locally famous after devastating koshi flood in 2008), swamps and marshes around koshi barrage in Sunsari. The first hand information was carried out to write up the present fishing methods in this periphery. The study areas are Devanjung and Barju Rural municipality (more than 400 Fishermen) in Sunsari District and Koshi Rural Municipality around Koshi Barrage where there is more than 600 Fisher family residing. There are around 15 to 20 personals from Malaha community for regular fishing in ChandaMohana River in Barju Municipality. They prefer to go for fishing in Wednesday and Saturday because there is local market day (Locally called Hatiya), but almost all day they go for fishing in brook and ditches for their household consumptions. They not only depends on fishing but also practice agricultural activities like maize farming, paddy cultivation and goat rearing in small scale, some goes for labor work in construction in Biratnagar (capital of Koshi province). The women around Koshi barrage are involved in weaving mattress from local plant materials (PATER). Some women are involved in marketing fish in local market basically in cutting for table consumption, some goes for agriculture labor works, for construction works in Kathmandu, Biratnagar Delhi (India). The children's of this community go to school. When they go for fishing, they earn Rs 1000 per day but in daily wages they earn Rs 700-800 per day. So, they prefer to go for fishing. There have been very few studies on SSF, fishing gears and fishing method adopted around the Koshi Barrage areas.

Objectives:

To gather information on livelihoods, the types of fishing gears and indigenous knowledge used by small-scale fisher communities around the buffer zone of Koshi Tappu Wildlife Reserve Areas.

Materials and Methods:

The study aimed to identify the present conditions, prospects, and problems faced. Different participatory rapid appraisal tools such as close observation, focused group discussion, field visits, and fisher's interviews were used to collect relevant information. This report is written by observing the harvesting and marketing closely. This survey report is finalized thereby recording information from interviews.

Mode of farm visit survey:

Fisher community and the members are key informants; this study aims to understand the further livelihood plans.

Study Area:

Actually, a detailed study survey was conducted in koshi barrage areas. The study is based on primary information gathered from skilled practitioners. The information was collected from May to June 2023 through individual interviews, surveys and Focus Group Discussion with the small-scale fisheries communities living in the study areas. Other information was collected from secondary sources, published papers on fish and fisheries of Koshi River areas etc.

Result and Discussion:

The main fishing communities in Koshi Pradesh are Malaha, Bahardar, Mukhiya, Sahani (ethnic communities) etc. They are involved in fishing, boating, fish harvesting and marketing as well. The major means of livelihood to all fishers were fishing, marketing etc. These fishers are not formally trained, the skilled and knowledge is being transferred from their ancestors. There were around 400 active fishermen living nearby Koshi Barrage in Nepal side. Mostly landless probably. They were also engaged in agricultural activities, laborers in Nepal and India. The major fishing nets used in the areas were cast net, lift net, gill net and basket types of fishing gear. Women were involved in marketing fish in local market basically in cutting for consumption, some goes for agriculture labor works, and construction works in Kathmandu, Biratnagar of Nepal and India. When they go for fishing, they earn Rs. 1000-1500 (7-11 US\$) (harvest 1 to 1.5 kg of fish on an average) but in daily wages they earn Rs 700-800 (5 – 6 US\$) per day. So, they prefer to go for fishing. The children of this community go to school.

General Issues in the study area:

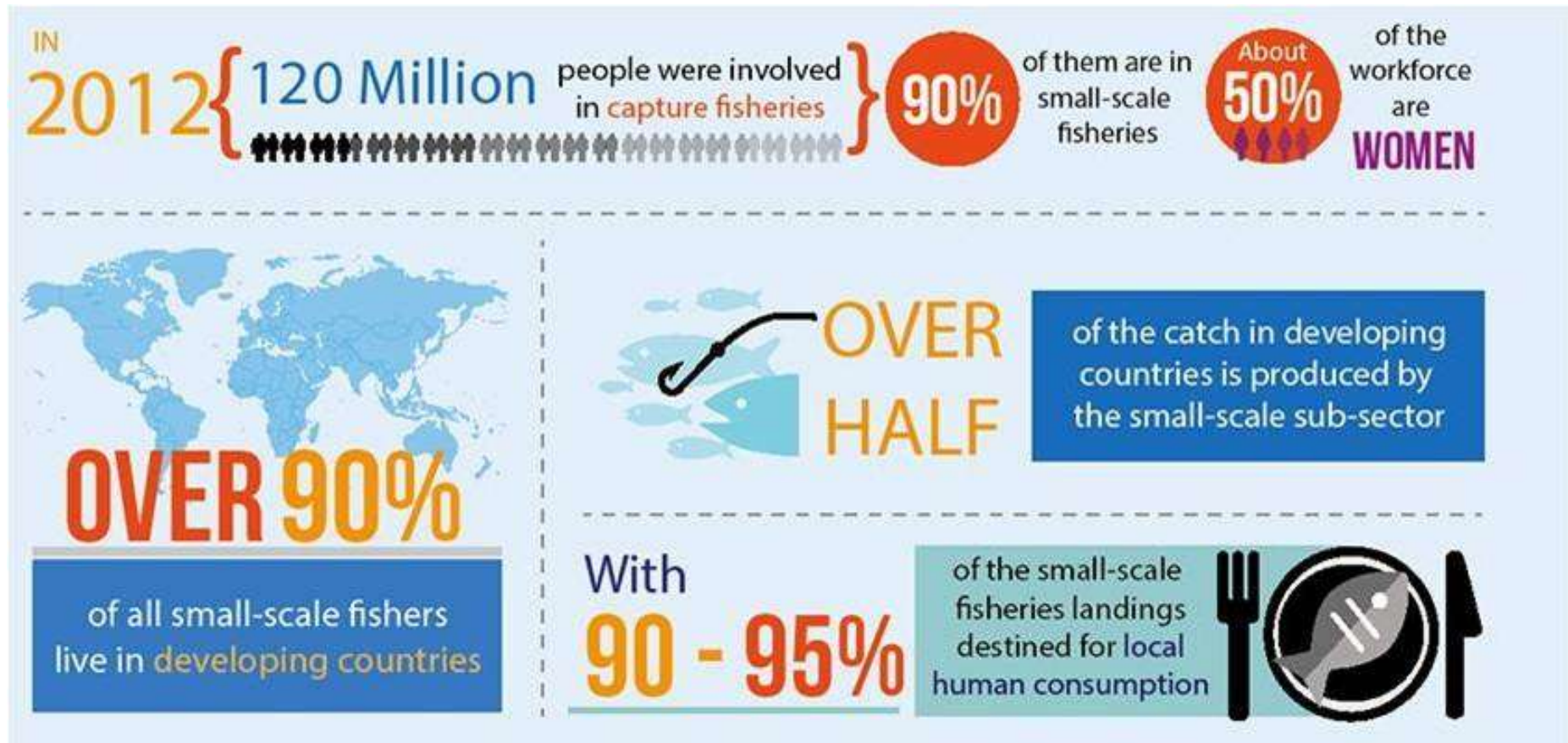
Despite their contribution the community is not visible or accounted in policies. Livelihoods challenges due to decline in resources. Increasing pressures on fisheries a serious challenge. Poor documentation about small scale fisheries communities largely depend on wetland products or services. Issues of SSF communities are poorly documented. Capture fisheries involve about 400 active full-time fishermen, 90 % of them are landless. Boating another livelihood option to small-scale fisheries communities. Mostly belongs to Malaha community go for boating near dam side (buffer zone of KoshiTappu Wildlife Reserve). The earning is Rs 2000 - 3000 (15-22 US\$) per day but earn Rs30000 -60000 thousand ((225 US\$-451) per month during flood season using boat on rescue operations during flood disaster. They prefer to use big boat that has high carrying capacity of 60 to 70 peoples. Small boat is easy to operate but risky and high chance of accident. They themselves made boat made from locally available wood and have skills to operate and maintenance of boat.

Conclusion:

It is concluded that better recognition of these community is key to securing skill-based occupation for sustainable small-scale fisheries (SSF). The food and nutritional situation of these communities required to be improved especially during the rainy season when the concerned authority declares the ban on fishing. The migration issues related to their livelihood, besides there are many more social issues of the communities to be resolved. A further detailed study should be performed for their human rights and mainstreaming them.FAO Voluntary Guidelines of (SSF) should be implemented soon. Supportive legislations for the conservation of indigenous knowledge is of utmost importance.

Small-Scale Fisheries are Too Important to Fail

Prepared and Presented by: Ratana Chuenpagdee Too Big To Ignore Global Partnership Memorial University of Newfoundland Canada
The global importance of small-scale fisheries

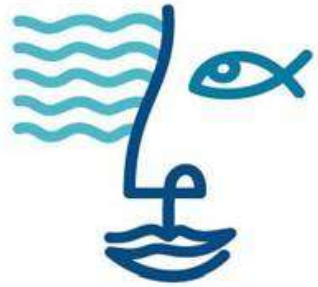


<http://www.fao.org/voluntary-guidelines-small-scale-fisheries/ihh/en/>

TABLE 1 WORLD FISHERIES AND AQUACULTURE PRODUCTION, UTILIZATION AND TRADE¹

	1990s	2000s	2010s	2018	2019	2020
	Average per year					
	<i>Million tonnes (live weight equivalent)</i>					
Production						
Capture:						
Inland	7.1	9.3	11.3	12.0	12.1	11.5
Marine	81.9	81.6	79.8	84.5	80.1	78.8
Total capture	88.9	90.9	91.0	96.5	92.2	90.3
Aquaculture:						
Inland	12.6	25.6	44.7	51.6	53.3	54.4
Marine	9.2	17.9	26.8	30.9	31.9	33.1
Total aquaculture	21.8	43.4	71.5	82.5	85.2	87.5
Total world fisheries and aquaculture	110.7	134.3	162.6	178.9	177.4	177.8

FAO(2022) The State of World Fisheries and Aquaculture



INTERNATIONAL YEAR OF
**ARTISANAL FISHERIES
AND AQUACULTURE**

2022

Small in scale, big in value.

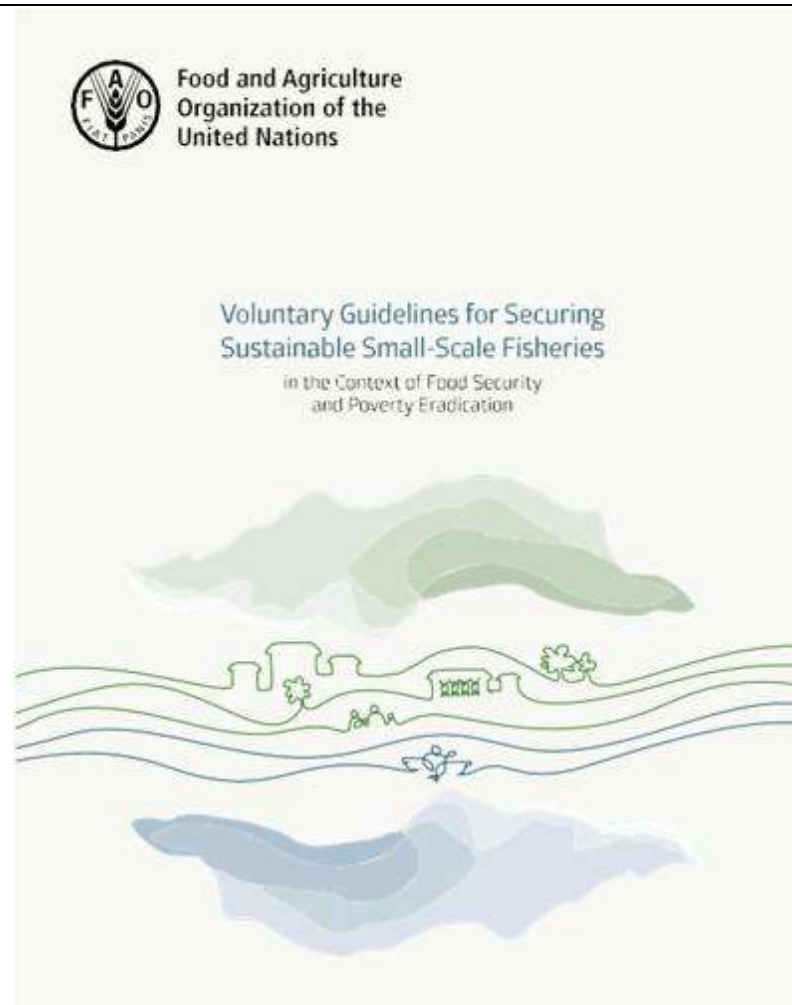


IYafa VISION STATEMENT

A world in which small-scale artisanal fishers, fishfarmers and fish workers are fully recognized and empowered to continue their contributions to human well-being, healthy food systems and poverty eradication through the responsible and sustainable use of fisheries and aquaculture resources.

Guiding Principles

- Human rights & dignity
- Respects of cultures
- Non-discrimination
- Gender equality & equity
- Equity & equality
- Consultation & participation
- Rule of law
- Transparency
- Accountability
- Economic, social & environmental sustainability
- Holistic & integrated approach
- Social responsibility
- Feasibility & social-economic viability



- High diversity/freshwater---marine
- Socially & organizationally complex/family---firm
- Dynamic sector/traditional---modernized
- Wide range of scale/South---North
- Involve women/men throughout the value chain



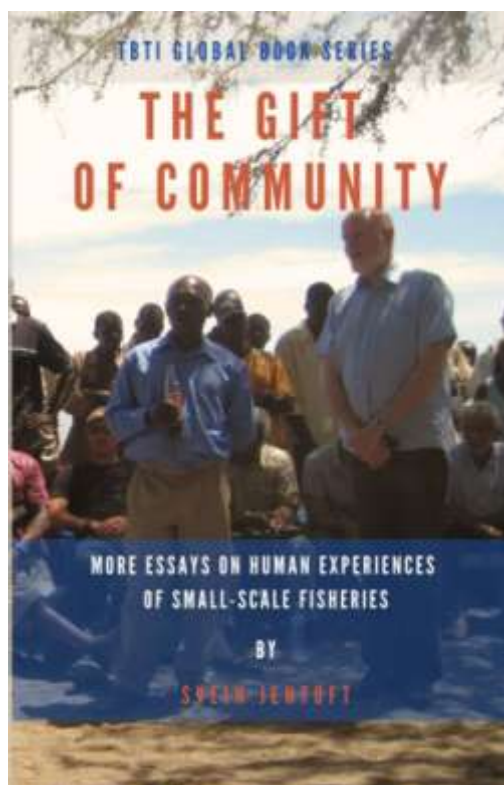


More than 500 researchers and 20 organizations from ~ 50 countries, working together to elevate the profile of small-scale fisheries, argue against their marginalization, reduce their vulnerability, improve governance, and address key concerns affecting their viability and sustainability.

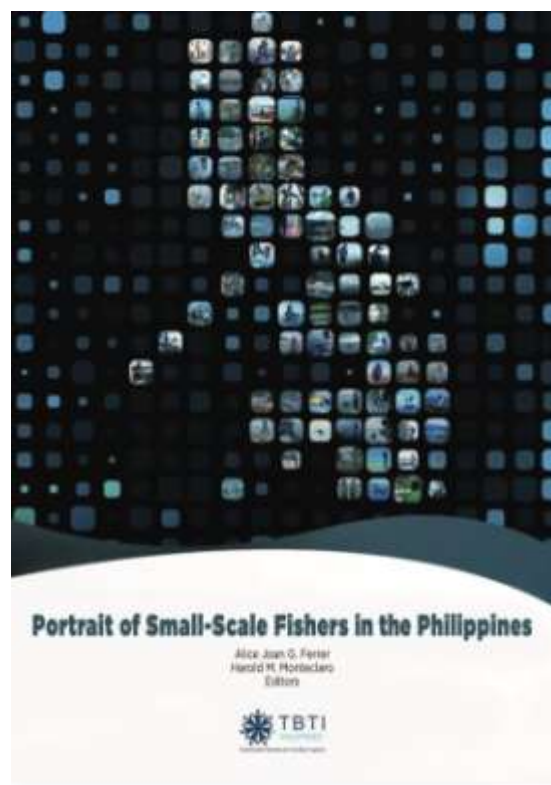
Case Studies Research and Thick Description: 300+case

Studies about small-scale fisheries in 80+countries

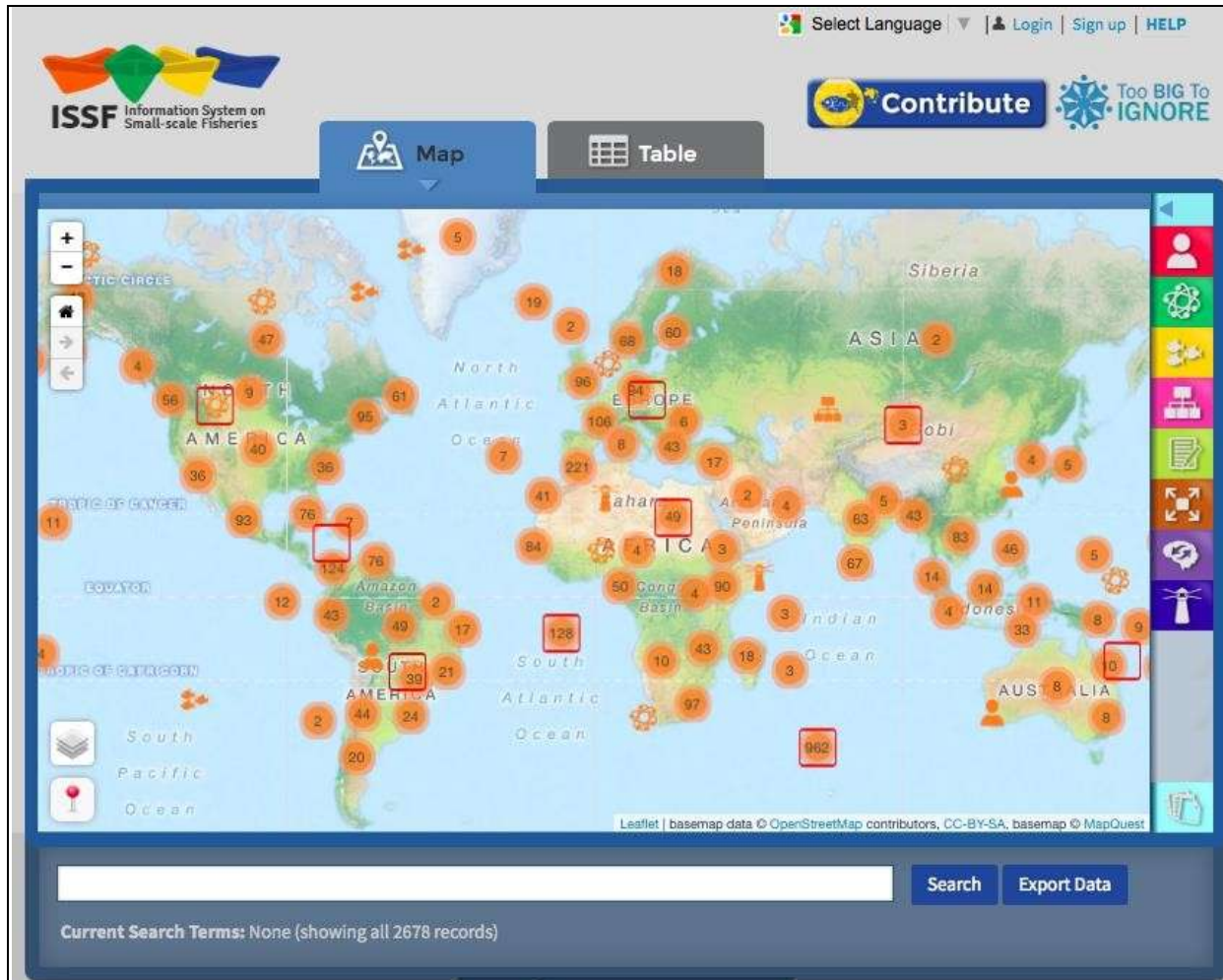
						
2015	2017	2017	2018	2019	2020	2022
						
2015, 2017	2018, 2019	2017	2019	2020	2021	2023



<http://toobigtoignore.net/the-gift-of-community/>



Information System on Small-scale Fisheries (ISSF)
Open, web-based, interactive, crowd-sourced platform



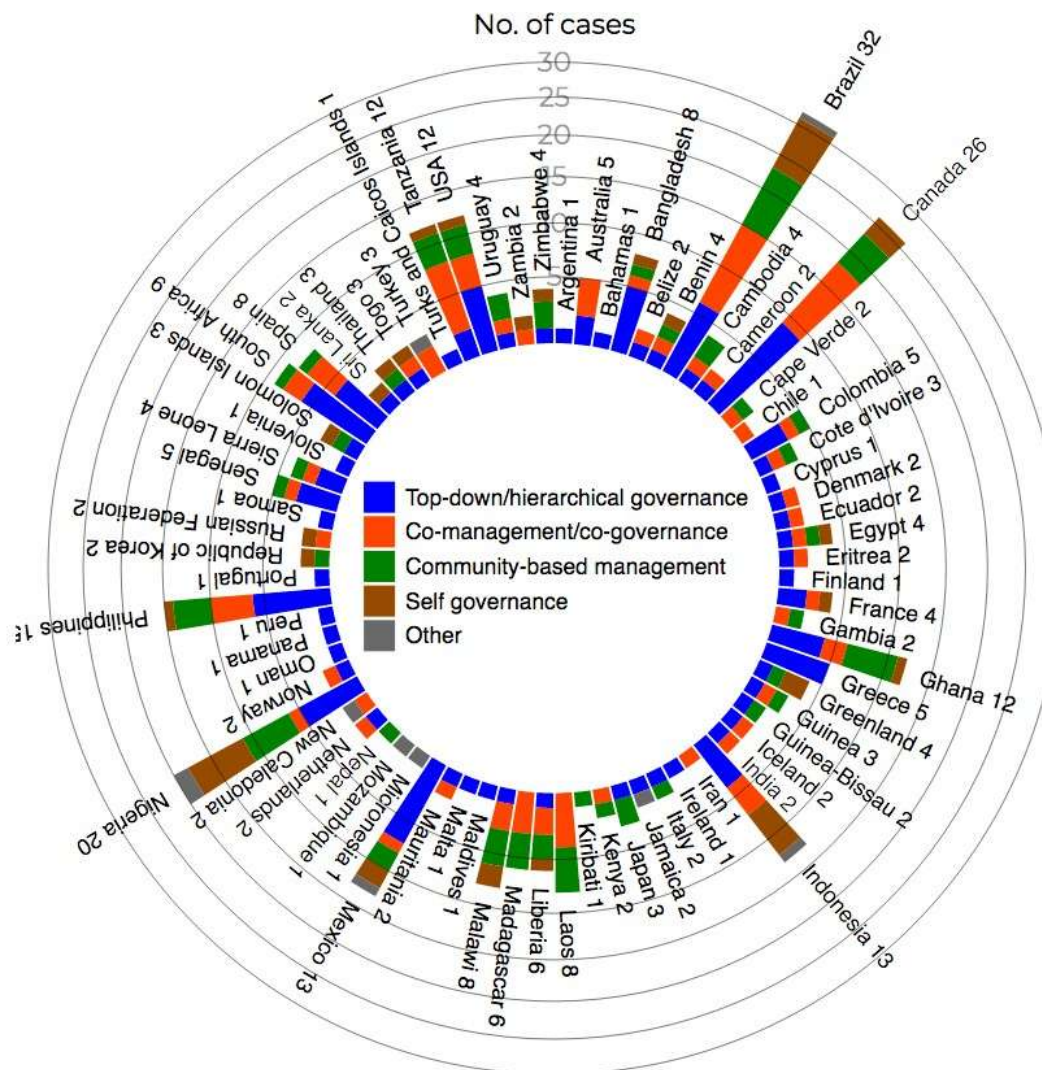
- Who's Who in SSF research
- State-of-the-Art
- SSF organizations
- SSF Profile
- SSF Guidelines
- SSF Capacity needs
- Blue Justice Alert

Issfcloud.toobigtoignore.net



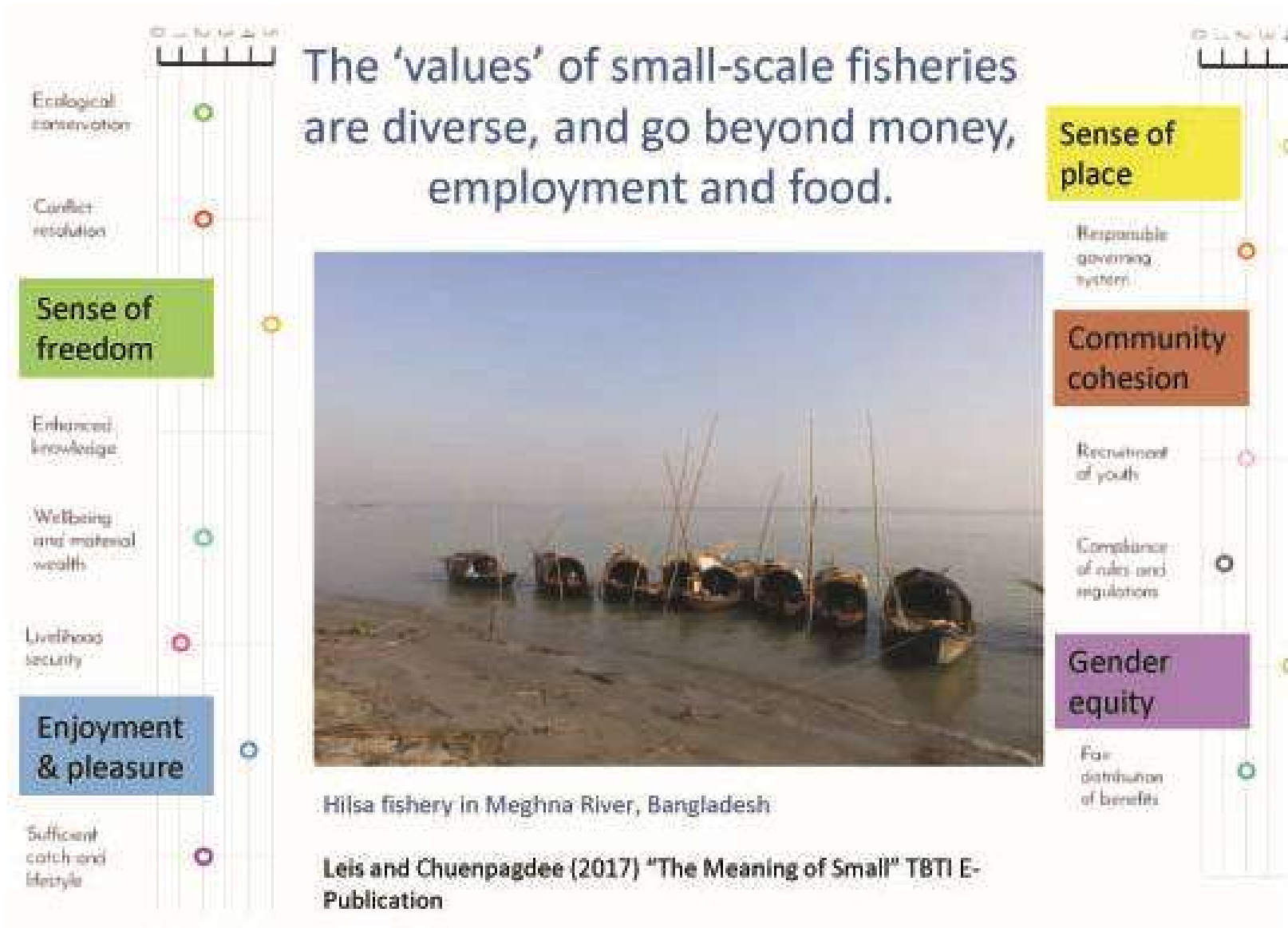
Who's Who in SSF Research



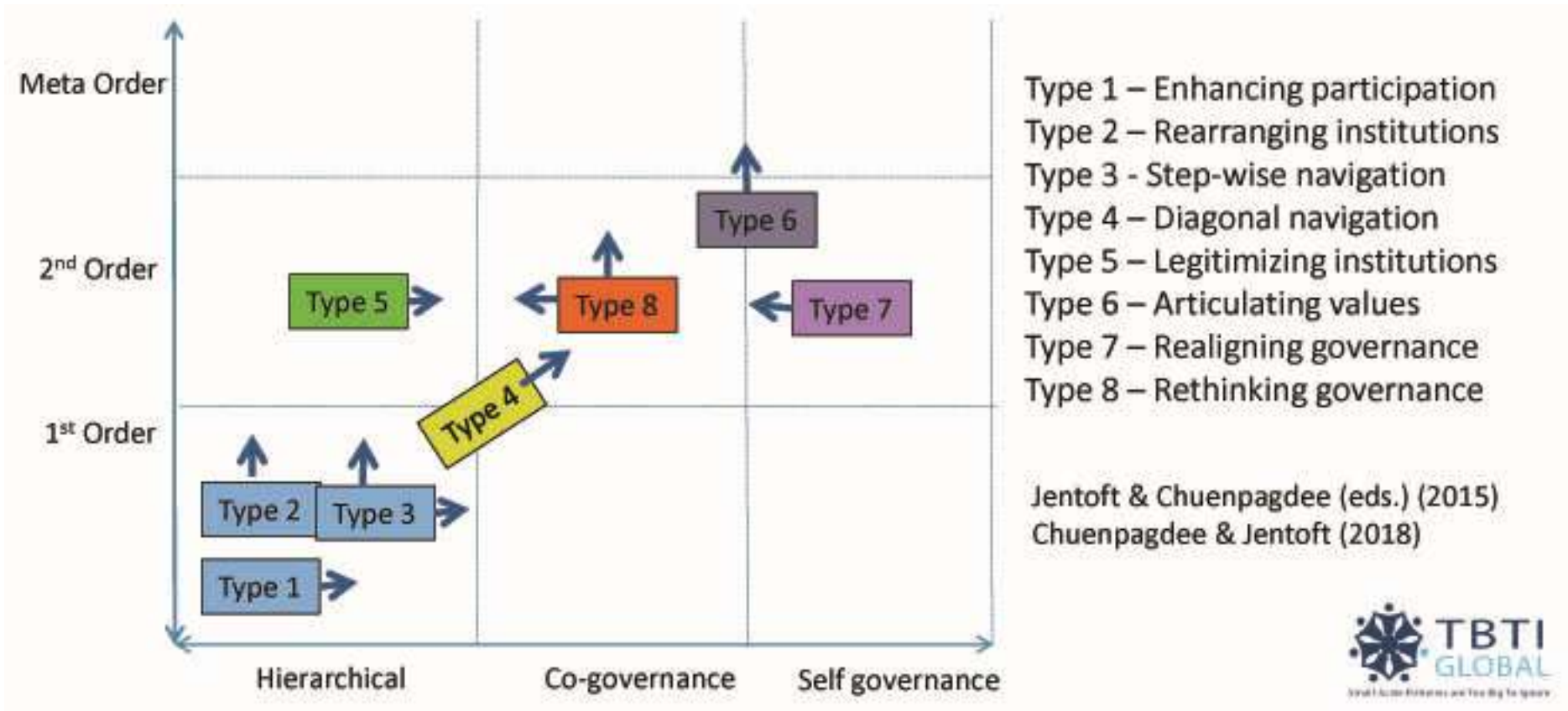


This visualisation shows the number of SSF profiles of various governance modes by countries

Mouse over the country to see the details | Click to rotate the wheel | Scroll to zoom the chart



Governance transition and transformation towards participatory/collaborative mode, with more attention on institutional arrangement and linkages (based on 34 country case studies)







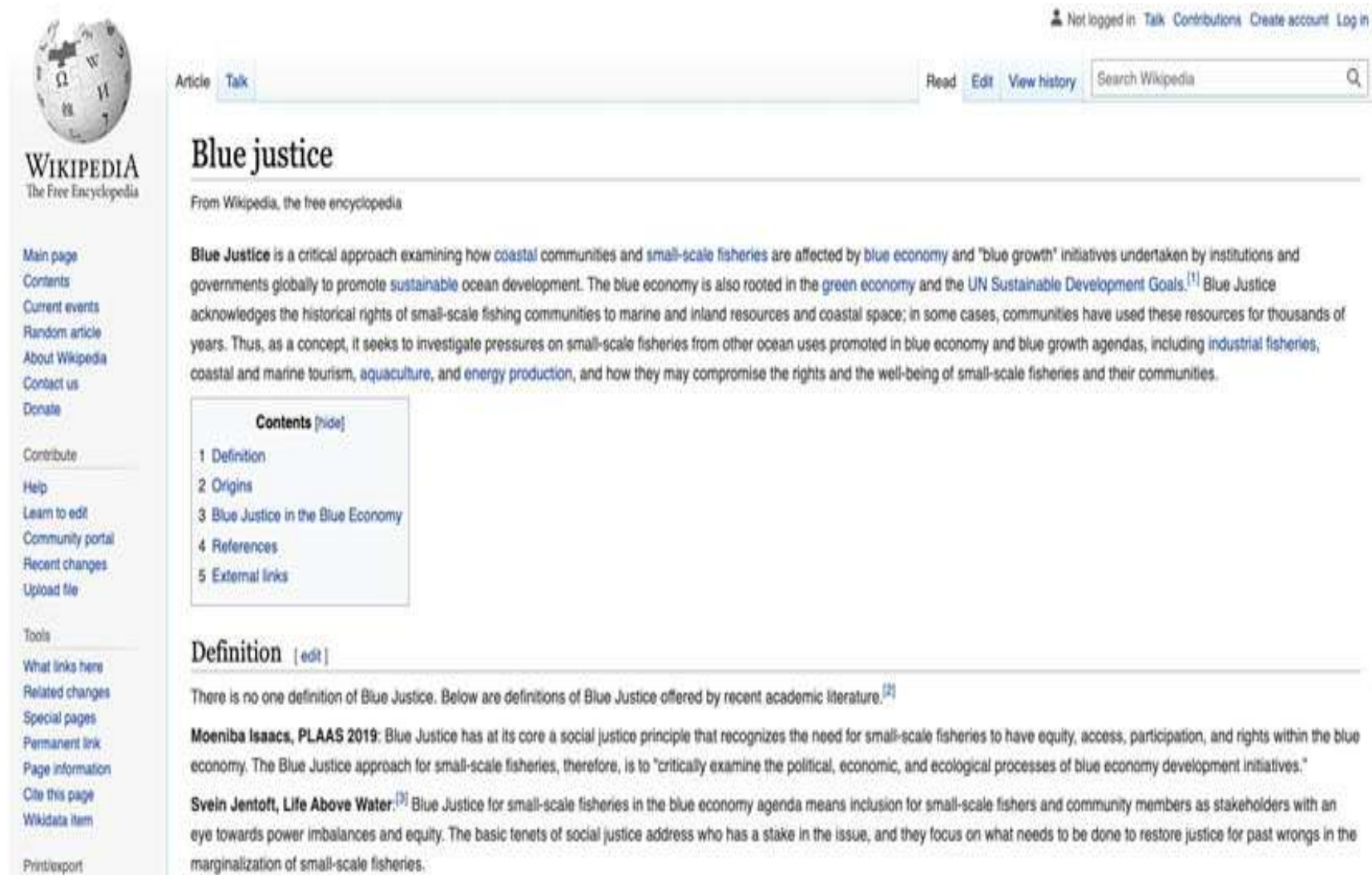
Blue Justice for Small-Scale Fisheries

#OceanAction29400

by TBTI Global (Non-governmental organization (NGO))

- Share stories and case studies that illustrate how policies, decisions and development agenda affect access and rights of small-scale fisheries and challenge social justice principles
- Facilitate science-policy dialogue to recognize the rights, values and concerns of small-scale fisheries in the discussion about sustainable development at all levels
- Build transdisciplinary capacity among governments and non-governmental organizations, researchers and community of practices to improve governance of small-scale fisheries, for fisheries sustainability worldwide.

"Blue Jusyice" as a complex and evolving concept



The image is a screenshot of the Wikipedia article for "Blue justice". At the top right, it shows the user status "Not logged in" with links for "Talk", "Contributions", "Create account", and "Log in". Below this is a search bar with the text "Search Wikipedia" and a magnifying glass icon. The article title "Blue justice" is prominently displayed, with a "Talk" tab next to it. Below the title, it says "From Wikipedia, the free encyclopedia". The main text of the article begins with: "Blue Justice is a critical approach examining how coastal communities and small-scale fisheries are affected by blue economy and "blue growth" initiatives undertaken by institutions and governments globally to promote sustainable ocean development. The blue economy is also rooted in the green economy and the UN Sustainable Development Goals.^[1] Blue Justice acknowledges the historical rights of small-scale fishing communities to marine and inland resources and coastal space; in some cases, communities have used these resources for thousands of years. Thus, as a concept, it seeks to investigate pressures on small-scale fisheries from other ocean uses promoted in blue economy and blue growth agendas, including industrial fisheries, coastal and marine tourism, aquaculture, and energy production, and how they may compromise the rights and the well-being of small-scale fisheries and their communities." Below the text is a "Contents" box with a "hide" link, listing: 1 Definition, 2 Origins, 3 Blue Justice in the Blue Economy, 4 References, and 5 External links. The "Definition" section is expanded, starting with: "There is no one definition of Blue Justice. Below are definitions of Blue Justice offered by recent academic literature.^[2]" It then lists two definitions: "Moeniba Isaacs, PLAAS 2019: Blue Justice has at its core a social justice principle that recognizes the need for small-scale fisheries to have equity, access, participation, and rights within the blue economy. The Blue Justice approach for small-scale fisheries, therefore, is to "critically examine the political, economic, and ecological processes of blue economy development initiatives." and "Svein Jentoft, Life Above Water.^[3] Blue Justice for small-scale fisheries in the blue economy agenda means inclusion for small-scale fishers and community members as stakeholders with an eye towards power imbalances and equity. The basic tenets of social justice address who has a stake in the issue, and they focus on what needs to be done to restore justice for past wrongs in the marginalization of small-scale fisheries." On the left side of the page, there is a sidebar with the Wikipedia logo and the text "WIKIPEDIA The Free Encyclopedia". Below this are various navigation links: "Main page", "Contents", "Current events", "Random article", "About Wikipedia", "Contact us", "Donate", "Contribute", "Help", "Learn to edit", "Community portal", "Recent changes", "Upload file", "Tools", "What links here", "Related changes", "Special pages", "Permanent link", "Page information", "Cite this page", "Wikidata item", and "Print/export".

SSF FACE INJUSTICES IN MANY AREAS OF LIFE



Kerezi et al. (2020) Blue Justice Stories from Around the World. TBTI E-book Publication

Conservation at what price? How fishers' livelihoods are compromised by a marine reserve in the Philippines



By Alice Joan G. Ferrer
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Balancing between geopolitical conflicts, ethnic struggles and sustainable development in Old Providence & Santa Catalina, Colombia



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2022

Chapter 18 Exploring Challenges of “Blue Justice” in Landlocked Mountainous Countries: The Case of Nepal



Tek Bahadur Gurung

Abstract In 2015, the United Nations (UN) championed the Sustainable Development Goals (SDG), which posed both relevant opportunities and challenges for small-scale fisheries. However, the SDG agenda largely overlooked inland water small-scale fisheries, especially in landlocked countries where millions of fishers are located. Given this omission, the chapter draws on the concept of Blue Justice to elucidate the scope and challenges of the “Blue Justice” for the promotion of small-scale fisheries in headwaters across landlocked countries. As an entry point for this analysis, published reports and research articles on per capita fish consumption, human development index (HDI), climate change, and making comparisons between coastal and landlocked countries were reviewed. This chapter presents small-scale fisheries of Nepal as examples of the “Blue Justice” context in landlocked countries. Small-scale fisheries in Nepal’s headwaters are relatively small in number and scale, but are important because represented by deprived, marginalized, and destitute ethnic communities. Based on the analysis, it concludes that to achieve Blue Justice and the SDG targets and promote the livelihoods of millions of small-scale fisheries in landlocked countries, it is vital to apply the three orders of governance for institutions strengthening on small-scale fisheries.

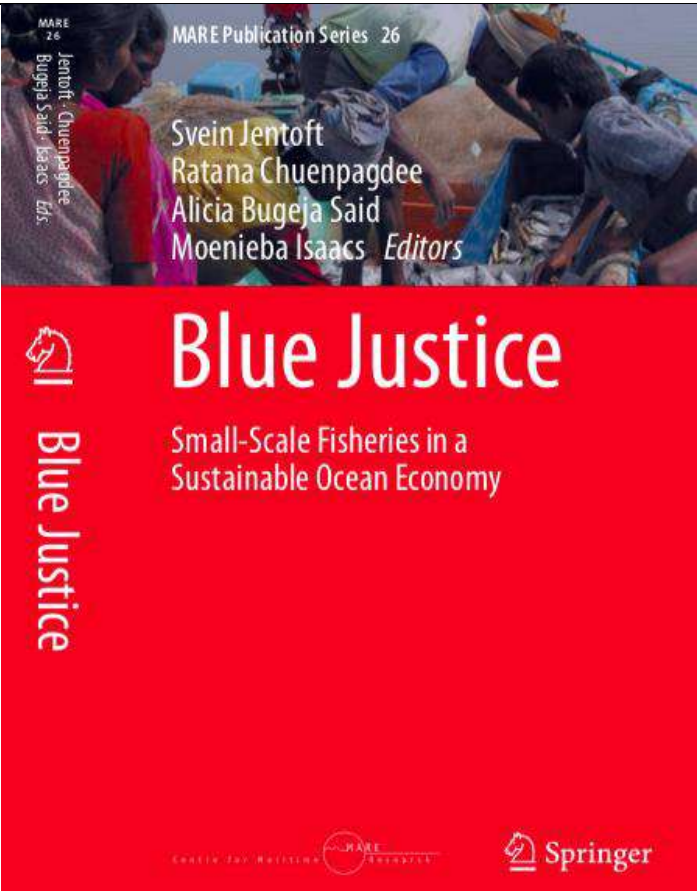


Study of governing order: Blue Justice challenges need to be addressed in all three orders of governance.

Governance orders	Key elements	Sample questions
Third (meta-) order	Norms/principles	Which justice principles are foundational for the governance system? Do they recognize or ignore the rights, needs, and interests of SSF?
Second order	Institutions/rules	What institutional characteristics does the governance system have? Are rules supportive or discriminatory vis-a-vis SSF?
First order	Actions/interactions	How do power relations affect SSF on a daily basis? Are patterns of interactions among stakeholders supportive or discriminatory vis-a-vis SSF?

Trickle up. Trickli down

Jentoft and Chuenpagdee (2022)

Blue Justice statements drawn from 30 case studies

 <p>MARE 26 Jentoft · Chuenpagdee Bugeja Said · Isaacs · Eds.</p> <p>MARE Publication Series 26</p> <p>Svein Jentoft Ratana Chuenpagdee Alicia Bugeja Said Moenieba Isaacs <i>Editors</i></p> <p> Blue Justice Small-Scale Fisheries in a Sustainable Ocean Economy</p> <p> Springer</p>	<ul style="list-style-type: none">• Justice issues have deep historical roots• Justice issues stem from old and new conflicts• Justice is systemic and multi-dimensional• Justice is a territorial and spatial issue• Justice is competitive in alternative livelihoods• Justice is an imminent issue for inland fisheries• Justice issues are more evident when in crisis• Justice is <i>a priori</i> condition for sustainable development• <input type="checkbox"/> Justice is about going beyond claims• <input type="checkbox"/> Justice needs a strong knowledge foundation
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2022

INJUSTICE EXPERIENCED BY SMALL-SCALE FISHERIES PEOPLE

EPISTEMIC BLUE INJUSTICE

Effects arise from epistemic injustice due to having no capacity or no access

<p>TESTIMONIAL INJUSTICE Someone's credibility is discounted due to prejudicial attitudes toward their identity (gender, social background or ethnicity)</p>	<p>HERMENEUTICAL INJUSTICE Difficulty understanding someone's experience due to gaps in knowledge and/or concepts or frameworks</p>
<p>BLUE CONSPIRACY An informal agreement among powerful actors to suppress information to vulnerability or punishment, in an attempt to keep them out of the legal system and to ensure power in the name of blue economy and/or the blue growth</p>	<p>CULTURAL VIOLATION Any action that disregards marine and coastal cultural aspects of value or undermines or erases small-scale fisheries people</p>
<p>ECO-BULLYING In deliberate intent to offend, harm, intimidate or control small-scale fisheries people through repeated verbal, physical and/or social behavior that is justified as being necessary to develop or conserve the marine aquatic ecosystem</p>	<p>FISHER TRAFFICKING The practice of employing immigrants and/or child labor and exploiting them through means of oppression</p>
<p>ECO-HARASSMENT Active hostility toward feelings of anger, anxiety, worry or concern among small-scale fisheries people, which by its nature serves and is justified as being necessary to protect the coastal and/or marine environment</p>	<p>INDUSTRIAL POLLUTION Introduction of waste or byproducts of fishing communities or small-scale fisheries people by large-scale industries and industries</p>
<p>FISHERPHOBIA/MISOPHALIA Stigmatization and/or hostility toward small-scale fisheries people due to misperceptions or stigmas that result in discrimination against them or leaving them in isolation</p>	<p>MARINE CARBON JUSTICE Harm caused to small-scale fisheries people and fishing communities or a lack of the equitable distribution of CO2 emissions based on sea-level rise</p>
<p>PARTICIPATORY DOMINATION The exercise of power in participatory processes and mechanisms of small-scale fisheries people, by being authoritarian, aggressive or discouraged by others, more powerful participants. This can occur merely, covertly, manipulatively or unethically</p>	<p>MARINE PRONAGE The use of small-scale fisheries people forced to work as labor</p>
<p>SIDE LINING FROM GOVERNANCE A situation that arises when due to lack of civic capacity, ability, negligence or discrimination, small-scale fisheries people are excluded from governance, small-scale fisheries</p>	<p>RECREATIONAL ASSAULT Damage to small-scale fisheries people as a result of recreational fishing</p>
	<p>SEAFOOD LARCENY Any action that involves the intentional theft or spoil of a public resource and thereby undermines the supply or availability of such that products in a coastal fisheries community</p>

Glossary is also available in:
 ~ French
 ~ Japanese
 ~ Portuguese
 ~ Spanish
 ~ Arabic (soon!)

Arias-Schreiber et al. (2022). Blue Justice and the co-production of hermeneutical resources for small-scale fisheries. Marine Policy 137 [open access]

SSF Guidelines ↔ SSF Sustainability ↔ SDGs



- Group A (> 8 issues) [9 countries]**
- Gambia, Ghana, Kenya, Mozambique
 - Indonesia, Philippines, Viet Nam
 - Costa Rica
 - France

Full length article

Unpacking legal and policy frameworks: A step ahead for implementing the Small-Scale Fisheries Guidelines



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- Group B (6-7 issues) [10 countries]**
- Algeria, Angola, Egypt, Morocco
 - Cambodia, Thailand, Fiji
 - Brazil
 - Malta, Portugal

- Group C (5 or < issues) [6 countries]**
- Libya, Nigeria
 - Malaysia, Saudi Arabia, Singapore
 - Jamaica

Making inland fisheries visible and impossible to ignore

- 2023: TBTI country hubs have been established in Philippines, Bangladesh, Ecuador, and many more in the years to come!



- 2024: "SSF As Solutions" Symposium to celebrate the 10th Anniversary of SSF Guidelines
- 2026: 5th World Small-Scale Fisheries Congress



The image shows a screenshot of the Too Big To Ignore (TBTI) website on the left and a large thank you graphic on the right. The website screenshot includes a navigation bar with 'Home', 'About TBTI', 'Partners', 'Research Clusters', 'Events', and 'FAQ'. The main banner features a group photo and the text 'Too Big To Ignore welcomes new members to the network'. Below this are sections for 'Mission', 'Research Instruments', 'Research Clusters', 'Facts & Figures', 'Research Highlights', and 'Member of the Week'. The thank you graphic has a blue and green geometric background and lists the following entities: Oak Foundation, Memorial University, Food and Agriculture Organization, Canada First Research Excellence Fund, and Social Sciences and Humanities Research Council of Canada. It provides contact information: toobigtoignore.net, issfcloud.toobigtoignore.net, and toobigtoignore@mun.ca. Social media links for 'tbtinetwork' on Twitter and Facebook are also shown. At the bottom, logos for TBTI (The Big To Ignore) and OCEAN FRONTIER INSTITUTE (with the tagline 'New Orders, Governance, Response') are displayed.

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