Environmental and Social Impact Assessment

and

Environmental and Social Management Plan

31 July 2022

CEPF Grant CEPF-113227

Dr Jagdish Krishnaswamy

Replicating community-managed fish conservation zones in free-flowing rivers

India

Grant Summary

1. Grantee organization: Indian Institute for Human Settlements
2. Grant title: Replicating community-managed fish conservation zones in free-flowing rivers
3. Grant number:CEPF-113227
4. Grant amount (US dollars): 49,999
5. Proposed dates of grant: October 01, 2022 to September 30, 2023
6. Countries or territories where project will be undertaken: India
7. Summary of the project:

Project Rationale: Fresh-water aquatic ecosystems, especially rivers are the most threatened biome globally. Rivers and their biodiversity and ecosystem services are relatively under-valued and neglected, exposed to pollution, habitat degradation and over-exploitation. The few remaining free-flowing rivers and streams are under serious threat of transformations such as upstream abstraction to meet human demands, especially for irrigation and their flow regimes are altered by hydro-power dams and reservoir operations. The altered flow regimes are a serious threat to aquatic biodiversity in the river and linked estuaries and also affect the livelihood of people dependent on freshwater and estuarine fisheries. Unsustainable fishing practices (electro-fishing, dynamiting, poisoning) have replaced traditional practices and this poses severe threats to many species of economic and ecological value. Knowledge gaps about the conservation

status of riverine biodiversity; taxonomic uncertainty; spawning sites and lack of stakeholder participation makes conserving freshwater biodiversity a difficult enterprise. Anthropogenic demands for fresh water from streams are likely to intensify with climatic and socio-economic changes, enhancing trade-offs between different sustainable development goals (SDGs) dependent on freshwater (e.g. SDG2, SDG6, SDG7, SDG11 and SDG15). Freshwater ecosystems and endangered aquatic species are not explicitly addressed in the SDGs, but only nested as targets within SDG6 and SDG15. Thus, there is a high risk that decisions to advance other SDGs may overlook their impacts on them (Momblanch et al 2021).

For example, head-water streams which support many endemic species of fish are increasingly being transformed and impacted by small-hydro dams which are considered "green" energy (Jumani et al 2018; Rao et al 2022). NE India is also emerging as a site for several new small hydro dams in India.

The Eastern Himalaya has been identified by the Critical Ecosystems Partnership Fund (CEPF) as one of 36 high-priority global biodiversity hotspots (Mittermeier et al. 2004). In India there is no formal framework for the community-based protection of freshwater ecosystems, although in some South-east Asian countries, such as Laos and Myanmar, successful community co-managed models of freshwater fish conservation have been implemented. Driven by the need to protect fish and their habitat from exploitative practices, in January 2021, the Khengjang and Yangoulen village councils in Manipur and the Lapalang village council in Meghalaya declared conservation zones in stretches of the river adjoining their villages. This was done with support from a recently concluded CEPF grant called Saving the Fish from Mekong to Meghalaya. This project is remarkable because it managed to achieve its major goals in spite of major disruptions from lockdown and travel restrictions and stresses on project staff and local communities during the Covid19 pandemic.

In Manipur, the Khengjang and Yangoulen villages of the Thadou Kuki tribe declared 2.47 km of the Tuivang River as a fish conservation zone, banning on all fishing and other human activities that could threaten fish or the river. We recorded 22 species of fish in the Tuivang river. Out of these one species, *Clarias magur*, is endangered; two species, *Channa orientalis* and *Rasbora ornatus*, are vulnerable; and two species, *Syncrossus*

berdmorei and *Ompok pabda*, are near threatened as per IUCN redlist. *Macrognathus morehensis* is endemic to the Chindwin River basin in the Indo-Myanmar region, while, Rasbora ornatus is endemic to the state of Manipur. Local fishermen say that the river provides breeding sites for fish during the monsoon. While monitoring the fish conservation zone, the project team and local communities documented biodiversity and record stream flows.

In Meghalaya, the Lapalang village of the Khasi War tribe has protected a 250 m stretch of the Rymben River from Jingsum Rimyllim to Jingsumboit where deep pools act as refugia for fish, especially during the dry season. Currently, there are 10 species of fish known from this stretch of the river (B. Massar, 2020, Fishes of Rymben-Borhir River System in Meghalaya, India, St. Anthony's College, Shillong, Meghalaya), of which the chocolate mahseer *Neolissochilus hexagonolepis*, Gray's stone loach *Balitora brucei* and catfish *Glyptothorax striatus*, are categorized as Near Threatened on the IUCN Red List. Apart from the community efforts to demarcate and implement the two fish conservation zones, this project led to many pioneering techniques in fish and hydrologic monitoring. These include the use of portable photariums to measure the size and identify fish and the use of telemetry to access data from rain gauges and water level recorders.

It is important to note that the Government of Meghalaya has established over 50 sanctuaries focused on Mahseer, and in contrast to the community fish conservation zones that the CEPF supported effort implemented, the government sanctuaries involve converting the free-flowing stream habitat into constructed ponds for Mahseer. It is highly likely that other native fish do not benefit from these "sanctuaries" which are technically a fresh-water aquaculture approach with artificial feeding that does not conserve the full range of native fish or their habitat. In these sites, there is no commitment to maintaining free-flowing streams, monitoring of ecological flows and its implications for overall fish habitat or conservation. The level of public participation in design and management is limited.

Therefore there is thus urgent need to replicate and upscale our model of scientifically informed and community-based fish conservation zones in Meghalaya and Manipur so that there is a paradigm shift in approaches to fish conservation in both government, local communities and civil society, In the absence of such a project and the replicable models

that it will showcase, the current development models are likely to transform the streams of Meghalaya and Manipur to the detriment of native fish fauna perhaps irreparably.

Project approach: We will adopt a three-pronged approach: knowledge and best practices transfer and sharing from existing fish conservation zones in Meghalaya and Manipur to one additional site in each state, followed by on-ground implementation and monitoring.

The first would be accomplished through a series of targeted workshops and field visits by community representatives from the new sites to the existing FCZs. The capacity-building workshops for local communities at the new sites in Meghalaya and Manipur would cover rapid aquatic biodiversity assessments, field hydrology, and a series of participatory workshops with local communities on workshops on conflict resolution, developing protocols for enforcement and monitoring FCZs will be held. The whole process of setting up FCZs will be carried out through a series of participatory workshops and field visits. We will also do a rapid assessment of five of the Mahseer "sanctuaries" established by the Government of Meghalaya to assess their impact on overall fish fauna and local hydrology.

There will be one day workshop in North East India which will involve discussions of the FCZ concept and experience with government fisheries and water resources officials. This will be followed by a national workshop on FCZs in IIHS Bengaluru which will bring together the FCZ representatives, stakeholders from the Ministry of Fisheries, the Government of India, fish conservationists and biologists and networks like the India Rivers Forum followed by a field exposure trip to the Western Ghats.

Field implementation and monitoring would cover site visits to identify and demarcate FCZs in a participatory framework, fish sampling, and installation of hydrologic stations in proposed FCZs. Field surveys/participatory approaches will be adopted to understand the dependence of freshwater fisheries in these communities and also to understand the cultural /religious role of fish. This will bolster on-ground efforts in seeking community support to manage FCZs. It would also include regular monitoring of FCZs.

8. Date of preparation of this document. July 31, 2022

9. Legal and regulatory framework:

The proposed work does not involve any protected areas. The rivers are managed by local communities in both the sites. Rymben river in Meghalaya is controlled by the village Headman and his council. Borhir river, on the other hand, is under the supervision of two Raids (Raid Mawshun and Raid Lyngkhat). A Raid comprises a few villages with its leader elected from the villages within its territory. Following the conventional and traditional land ownership system of the region, most of the land in the Rymben-Borhir area is owned by various clans and private individuals, thus giving them the sole right to use their land and river as they deem fit.

The management of Tuivang river in Sejang Theose village in Manipur comes under chieftainship, an indigenous secular institution based on kinship for the purpose of village administration which is the highest and most independent political unit. According to customary law, the office of Chief is hereditary passing from the father to the eldest son. As per the customary laws, a village is an independent political unit among the Thadou-Kukis and the Chief called HAOSA and his Council of Ministers are the political leaders. Administrations of justice, enforcement of executive function, maintenance of social practices and customary law, including religious performances are the areas of village administration under the Chief and his Council of Ministers. The Haosa and the village council decide and implement what is good for the people. Rivers and forest resources are protected and managed by the respective village chief. All the villagers living in a village have free access to the forests and rivers to collect minor forest products and go hunting and fishing.

10. Status of area to be impacted:

In Meghalaya, the project will focus on the "Rymben-Borhir" river system of Ri War, located in the East Khasi Hills District of the state. Communities from Rimassar village located along the river has given a consent to participate in this project. This village is inhabited by the Khasis tribe- an ethnic community that comprises the majority of the inhabitants of the state of Meghalaya in Northeast India. Khasis follow the matrilineal system. They are known by different names (Bhoi, War, Khynriam, Pnar, Maram) based

on the geographical locations in the state. The Khasis inhabiting the southern part of the state bordering Bangladesh are known as Wars and the area is called Ri War. War people speak the "war dialect"; Ri War is blessed with a warm climate, plenty of rains, streams and rivers and very fertile soil. The majority of the people sustain their livelihood by cultivating betel nuts, betel leaves, oranges, pineapples etc. Wars, like anybody else in the state like to hunt and eat fresh foods. The area has lost almost all mammals, birds, and reptiles due to overhunting. Among animals, the only natural resources available are the fish, though their populations are on the verge of extinction. People go to the rivers for baths, to wash clothes, and mainly for fishing. Fishes are caught on a daily basis with the help of bamboo fishing rods, nets (mosquito nets), hooks and sometimes chemicals. Once caught, any kind of fish big or small, adult or immature is taken home for consumption. Rymben river is controlled by the village Headman and his council. Borhir, on the other hand, is under the supervision of two Raids (Raid Mawshun and Raid Lyngkhat). A Raid comprises a few villages with its leader elected from the villages within its territory. Following the conventional and traditional land ownership system of the region, most of the land in the Rymben-Borhir area is owned by various clans and private individuals, thus giving them the sole right to use their land and river as they deem fit.

In Manipur, we will work with Sejang Theose village located along the Tuivang river. This village is located in Khengjoi Sub-Division in Chandel District of Manipur. The entire Khengjoi Sub Division is inhabited by the Thadou-Kuki indigenous community. The Thadous are found in Manipur, Assam, Nagaland and Mizoram in India, and in Chin State and Sagaing Division in Myanmar. In Manipur, they are mostly found in South-Western Hills and Sadar Hills, Churachandpur district, Ukhrul district, Jiribam and Chandel district. Their main occupation is shifting cultivation or Jhum Cultivation. Currently, timber logging and cattle trading are practised by the people in this part of the district. There is no electricity and telephone connectivity to date and the roads are motorable only in the dry season, that too only by trucks.

The Thadou-Kuki inhabited areas in Manipur are under chieftainship, an indigenous secular institution based on kinship for the purpose of village administration which is the highest and most independent political unit. According to customary law, the office of Chief is hereditary passing from the father to the eldest son. As per the customary laws, a

village is an independent political unit among the Thadou-Kukis and the Chief called HAOSA and his Council of Ministers are the political leaders. Administrations of justice, enforcement of executive function, maintenance of social practices and customary law, including religious performances are the areas of village administration under the Chief and his Council of Ministers. The Haosa and the village council decide and implement what is good for the people. Rivers and forest resources are protected and managed by the respective village chief. All the villagers living in a village have free access to the forests and rivers to collect minor forest products and go hunting and fishing.

Traditionally the communities in Meghalaya and Manipur have managed fishing in their rivers, thus, the fishing restrictions from the FCZ are expected to have fewer impacts on Indigenous People as the proposed FCZs are likely to be small when compared to the larger fishing grounds, and the majority of each village's fishing areas will remain open year-round. The indigenous communities in Meghalaya are matriarchal and women have a high profile in their roles and responsibilities. In Manipur, the village council takes a collective decision by involving every household in the village. Widows and women in the absence of men represent their family/household in the village council meetings. Thus in practice, women do have their say in any important decision that is taken in a village and is free to speak in any general body meeting or village council meetings, and they have equal opportunity to assert their views. In our project sites, women will be given equal opportunities to participate and benefit from managing fish conservation zones.

11. Baseline data:

Tuivang River in the state of Manipur is part of the Chindwin River Basin. This basin has the highest fish endemism in India (91 species) (Sarma et al. 2018). In the river stretch that passes through Sejang Theose village, around 22 species of fish have been recorded in an earlier survey of which three species are threatened and two are in near threatened category of IUCN redlist. Establishment of FCZ in this river stretch could help in the conservation of these threatened species of fish and other aquatic biota.

Our previous studies in the area suggests that fishing is not a major source of livelihood for the local communities although it is a cultural practice. Local communities had widely practiced shifting cultivation and selective logging in the catchment area. However, our

surveys indicate that over the years, the number of shifting farmers has drastically decreased and selective logging has been replaced by mechanized clear-felling of large tracts of forests. Anecdotal evidence suggests that this clear-felling on steep slopes has resulted in increased soil erosion and sediment loads in rivers. Local people have also reported increased flood events along the Tuivang River in recent years, which could be related to logging as degraded forests reduce rain-water infiltration and increase runoff which corroborates the findings of Krishnaswamy et al. (2012). Establishment of FCZ along with its rules related to tree felling could help in conservation of riparian habitat along these conserved stretches of the river.

The project site in Manipur, does not have electricity and telephone connectivity to date and the roads are motorable only in the dry season, that too only by trucks. There are efforts in the area to build infrastructure and improve the connectivity. Some of the proposed roads will pass through the rivers and the construction phase could pollute river systems. These proposed developments have forced us to select FCZ sites that are away from these constructions and will not be affected by any of these developmental activities.

In Meghalaya, the project site, Rimassar village, is located along the Rymben-Borhir River System. Currently, there are 10 species of fish known from this stretch of the river (B. Massar, 2020), of which the chocolate mahseer *Neolissochilus hexagonolepis*, Gray's stone loach *Balitora brucei* and catfish *Glyptothorax striatus*, are categorized as Near Threatened on the IUCN Red List. Establishment of FCZ will help in conservation of these and other fish species in these river systems. Our study in this area suggests that fishing is not a source of livelihood and the majority of the people sustain their livelihood by cultivating betel nuts, betel leaves, oranges, pineapples etc. However, fishing is a cultural practice. Fishes are caught on a daily basis with the help of traditional as well as destructive practices like chemicals and electro-fishing which has resulted in depletion of fish stock in these Rivers (B. Massar 2020). Establishment of FCZ will help in conservation and increase in fish population in the river.

At the project site there are no proposed future development activities by the Government or the community.

12. Anticipated impacts and risks:

Positive Environmental and Social Impacts:

1. The community will be enriched from the training and workshops to be organized on fish conservation. People will learn how to protect the breeding sites and monitor the depth /flow of water.
2. The project will bring closeness among the people through meetings and workshops.
3. It will also open up job opportunities for few people who will be preferentially chosen from any individuals if at all whose traditional livelihoods are in any way impacted by fish conservation zones.
4. Most of all, the project is expected to stabilize and increase the population of all the fish species and other aquatic organisms in the river, thereby very beneficial for the people who will get to eat local healthy fishes instead of preserved or aquaculture fishes brought from other states. This will enable people to link their heath, nutrition and culture with community based fish conservation in free-flowing rivers.
5. The current destructive practice of electro-fishing and dynamite fishing can be curbed through awareness and community regulation.
6. The success of this project could simulate interest among other communities living along the free-flowing rivers and its tributaries.
7. Restriction on logging along FCZ will help in protection and conservation of Riparian vegetation and associated biodiversity along FCZ.

Negative Environmental and Social Impacts:

1. Though beneficial, the project will restrict traditional or conventional ways of procuring fish from certain stretches of the river.
2. Establishment of shelters to accommodate watchmen or patrolling teams might be required to prevent illegal fishing in the project sites. These may impact some individuals who wish to continue their activities along the river without any restraint. or watch. These may also impact the aesthetics of the site.

13. Mitigation measures:
    1. Restriction on fish catching will be developed and introduced in a participatory manner by conducting village meetings and participatory workshops. Communities will voluntarily decide on the areas that will be declared as FCZ. Free, Prior and Informed Consent from local communities will be obtained prior to the implementation of the project as was done in the previous project when the first FCZs were established. Formal consent letters will be obtained in both English and local languages from the village chiefs and members of the village council. Similar consent from other interested villages will be obtained before initiating project activities. The consent will be obtained after village level meetings which will be chaired by the village council and all stakeholders including women will be made aware of the project objectives and grievance mechanism process. These meetings will help in identifying affected individuals and potential solutions to mitigate impacts.
    2. At the project inception meeting at each of the villages, the grievance mechanism will be explained, and all details mentioned above will be printed as a handbill and posters to be available in the headman's house and community center. Project staff will provide opportunities for community members to express grievances during all project workshops and will inform the community during consultation meetings about their rights to complain and to stop participation in the project at any time if they are not satisfied.
    3. The proposed FCZs are likely to be small when compared to the larger fishing grounds, and the majority of each village's fishing areas will remain open year-round.
    4. FCZs have been shown to increase fish populations inside and outside their boundaries, and are often established to address declining fish catches, with the hope that partial restrictions to resource use inside FCZs will lead to increased fish catches outside FCZs. This may generate livelihoods, increase food security and provide secondary income for community members.
    5. If any adverse social impacts from the FCZ are detected during the project, these will be presented to the communities to decide whether they want to lessen or

modify the restrictions of the FCZ as part of the adaptive management process. This could involve moving the boundaries of the FCZ, permitting occasional harvest in the FCZ during specified time periods, reducing the restrictions on types of banned fishing gear, or lessening the fines incurred for violating FCZ regulations.

6. The adverse aesthetic affect of establishment of shelters for patrolling teams to prevent illegal fishing in the project sites will be reduced by choosing locally available materials to build these shelters. Efforts will be made to keep the construction work to the minimal levels.

14. Actions to ensure health and safety:

Working in the river systems could be risky during high flow times. Fish sampling and flow measurements will be avoided during the high flow periods. Clear guidelines on sampling schedule will be provided to the field team and the communities.

15. Monitoring and evaluation:

1. Changes in fish population along FCZ will be monitored through regular fish sampling and informative questionnaire surveys.
2. Questionnaire survey and group discussions will be conducted to record People's perceptions towards FCZ and its impact.
3. Data on community sentiments with the project will be collected regularly through informal conversations
4. The data collected in above steps will be analysed and appropriate measures will undertaken time to time to ensure that the project is in compliance with CEPF Safeguard Policies.

16. Timeline and resources:

Fish sampling will be conducted at the beginning, mid-point and towards the end of the project. Questionnaire surveys to document changes in fish population as observed by people will be conducted towards the end of the project.

Consent letters will be obtained from the village chiefs and members of the village council in the month of October 2022 through village meetings. Consent from other surrounding villages will also be obtained during the village meetings in the months of October and November 2022. Village communities will be informed about the grievance mechanisms in all the village meetings that will take place from the beginning of October to December 2022. Villagers will be involved in the management and monitoring of FCZ throughout the project period. The results of FCZ including any adverse social impacts will be presented to the village communities during the participatory workshops and meetings that will be held after 6 months of establishing the FCZ in March 2023, where they will be able to suggest changes in the FCZ management plans.

A small questionnaire survey will be designed to record People's perceptions towards FCZ and its impact during the village meetings at the beginning and at every quarter of the project period. Group discussions will be held during village level participatory workshops in March where participants are encouraged to express their views about the ongoing project. At the end of every quarter, we will provide an update to CEPF on compliance with safeguard policies which will include photographs of activities with the community, and a detailed stakeholder mapping of individuals likely to be impacted by establishment of fish conservation zones (positive and negative) along with a plan made in consultation with the community for alternative livelihoods during the period of transition.

Research staff, biologists, PI and Co-PIs will be involved at various phases of conducting these meetings and activities.

17. Permission of the landowner:

Permissions to conduct the project in proposed sites will be obtained from relevant village council authorities/individual land owners if any.

18. Participatory preparation:

Experts in various fields, hydrology, wildlife biology, anthropology, and conservation have been involved at different phases of development of this project proposal. Local communities were consulted during the conceptualization of this project and free, prior

and informed verbal consents were obtained from village chiefs and committees for inclusion in this project. The project is designed with input from the members of local communities. Our partner in Meghalaya, Bashida Massar from the Department of Zoology, St.Anthony's College, Shillong is a Khasi (War) and belongs to a village located within the project site of Ri War. In the last few years, she has organised awareness programmes for the school students and with them she has monitored the flow of Rymben river for a year (2016). She has also documented and studied the status of all the fish species of Rymben-Borhir river system. In 2017, an awareness programme on natural resources (fishes in particular) for 16 villages of Ri War was organised in which the heads of the village councils, the leaders of the various groups were the participants. The leaders opined that such programmes should be organised in each village and any interventions to protect the resources will be supported by the local communities.
Our partner in Manipur, James Hoakip from the Anthropology Department, University of Sikkim, is a Thadou-Kuki from one of the villages located along the Tuivang River. His earlier work has documented the livelihood and dependence on natural resources by communities along the Tuivang river. He has also given a number talks on the importance of biodiversity conservation of the region in public platforms among village councils and students. He is personally known to other chiefs of the area and had experience of working with them. The Chief or Haosa of the participating villages have been informed of the project goals and they expressed interest and willingness to extend support to conserve fish stocks in the region.
Village heads, the council and other village groups will be informed about the project aims, objectives, associated risks, and benefits of the project during the village meetings that will be held prior to the implementation of the project. All queries and concerns of communities will be addressed during the meetings. Consent from all village heads and key stakeholders will be obtained in written form in both English and local languages before implementing this project.

19. **Disclosure**:

All records of village meetings, questions and concerns raised, and feedback from the communities will be maintained meticulously and analysed. These results along with the

data on fish population will be presented to the village communities and stakeholders during the participatory workshops and meetings that will be held at every quarter of the project period. These reports will be made available on the organisation's website and the project page.