Delineation of Mahseer Water and Trout Water in Bhutan

Department of Forests and Park Services
Ministry of Agriculture and Forests
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A supporting document for enforcing provisions of fishing as per the FNCRR (Amendment) 2022

1. Background

Bhutan is endowed with rich natural water bodies in the form of rivers, streams, and lakes. There are many major rivers namely Amo Chhu, Wang Chhu, Punatsang Chhu/Sunkosh, Manas River (includes, Mangde, Chamkhar, Kuri and Dangme Chhu), Nyera Ama Chhu, and many other minor rivers with the total length of the rivers and their tributaries estimated to be about 7,200 km (Fig. 1), and over 2,674 lakes of various size, mostly being glacial lakes. These water bodies are a repository of freshwater biodiversity, which include fishes. There are over 115 species of fishes found in the waters of Bhutan, including two species of Mahseer, the endangered golden mahseer *Tor putitora* and near-threatened chocolate mahseer, *Neolissochilus hexagonolepis*.

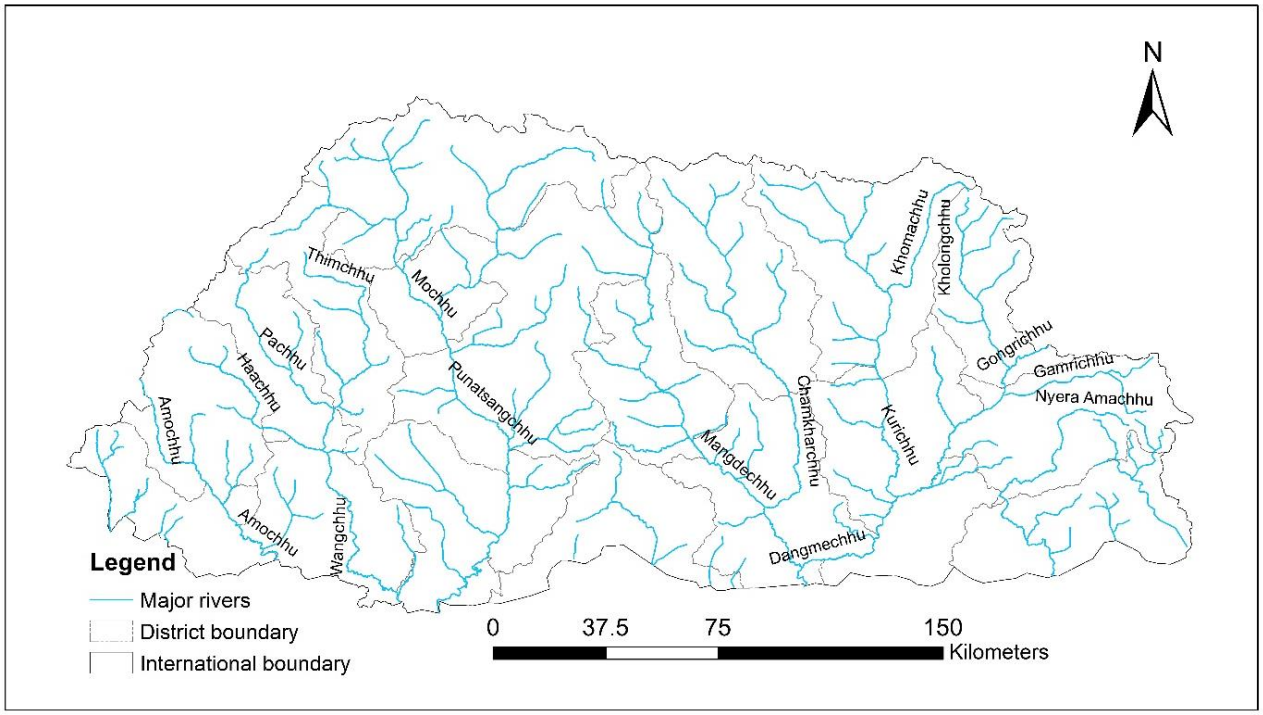

Figure 1. Map of Bhutan showing the major rivers and their tributaries.

Fish is identified as a forest produce (natural resource) in the FNCA 1995, the prevailing law and regulation allows for sustainable management of this resources through two ways;

i) Recreational Fishing using appropriate equipment specifically for catch and release purposes
ii) Sustainable harvesting of fish resources for consumption through development of community-based fishery management plans.

However, the provisions in the past regulations did not allow for recreational fishing of Golden Mahseer in Bhutan, mainly due to lack of scientific information on the species and it being listed in Schedule I of FNCA, 1995. Internationally, Golden Mahseer is one of the most sought-after fish by recreational anglers (for totally catch-and-release and non-consumptive). Although public recreational fishing is allowed in Bhutan, angling for Mahseer is not, with the exception being scientific activities or specially permitted groups. On the contrary, Mahseer angling were

promoted by charging huge fees by certain tour operators to foreigners (*as evident from the web pages of the tour operators*,) by availing the fishing permit at the fee determined for fishing trout species. Mahseer recreational fishing, therefore was lucrative recreational programme that potential of which remain untapped. In order to understand the ecology and status of Mahseers in Bhutan's river, a study was conducted by the Ministry since 2015 on the Manas river basin. The study found that Manas river basin has a healthy population of two species of Mahseer, Golden mahseer and Chocolate Mahseer, which has potential to attract high-end mahseer anglers. As such, creating enabling conditions through policy and rule is felt necessary to capitalize this opportunity for a greater benefit to the nation. Accordingly, the FNCRR 2017 has been amended to encompass a more sustainable and profitable recreational fishing programme in Bhutan for both mahseer and trout species.

The amendment of the fishing regulation which was based on scientific data and information allows for the delineation of Bhutan's rivers into 'Mahseer water' and 'Trout water' and set out clear direction for promoting recreational fishing in the two water types with a different set of fishing permit fees and associated regulations. Therefore, it is of paramount importance that Mahseer waters are clearly delineated, mapped and described for seamless promotion of Mahseer recreational fishing and enforcement of the amended regulations.

II. Mahseer Conservation Research and Findings

The Ministry of Agriculture and Forests, in collaboration with WWF Bhutan and the Fisheries Conservation Foundation (USA) completed a five years Mahseer Research and Conservation Project (2015-2019) with special focus on Mahseer in the Manas Watershed. Following are some of the key findings;

i. Mahseer have a consistent pattern of seasonal movements with upstream migration during the spring (starting February) and downstream migration during the autumn season (October onwards). It was found that Mahseer migrate upstream to elevations as high as 1000 m.

ii. The spawning of Mahseer happens at all upstream elevations where smaller tributaries join the main rivers, and these confluences serve as key Mahseer habitats. It was also observed that individual fish never switched main rivers (MangdeChuu and DangmeChuu during their migrations, even returning to the same spawning river year after year during the study period.

iii. The research also found that there were high incidences of illegal fishing for Mahseer, with more than 50% of the tagged fish suspected to have been illegally harvested. Evidence of illegal fishing methods such as cast netting, gill netting, and baited lines were observed extensively throughout the basin. In addition, water withdrawal, pollution from trash and untreated waste water, sand mining, rock crushing, and dams were also found to be threats to Bhutan's rivers.

Drawn from these scientific findings and in pursuant to Rule No. 272 of the Forests and Nature Conservation Rules and Regulations of Bhutan (Amendment) 2022, the Department of Forests and Park Services is delineating the Bhutan's Rivers into "Mahseer waters" and "Trout waters".

III. Delineation of Mahseer water and Trout water

The preliminary basis for delineation is based on the information that Mahseer move to elevation as high as 1000 m. However, all the waters within the 1000 m elevation does not have mahseer species in them so as defined in the amended regulation where "Mahseer water" is defined as "all so delineated water bodies in Bhutan, that is, where Mahseer are believed to be present for at least part of the year" waters are accordingly delineated as Mahseer water. 'Mahseer' as defined in the amended regulation shall mean "*Tor putitora*, commonly referred to as Golden Mahseer or Sernya and *Neolissochilus hexagonolepis*, commonly referred to Chocolate (or Copper) Mahseer or Katla, unless otherwise specified". The delineated Mahseer water of Bhutan is as shown in Fig. 2 and the details of the river as described in Annexure I. Notwithstanding Fig. 2 and Annexure 1, all other water bodies of Bhutan will constitute as part of trout water as defined in the amended regulation. The regulation defines "Trout water" as "all other water body not delineated as Mahseer water".

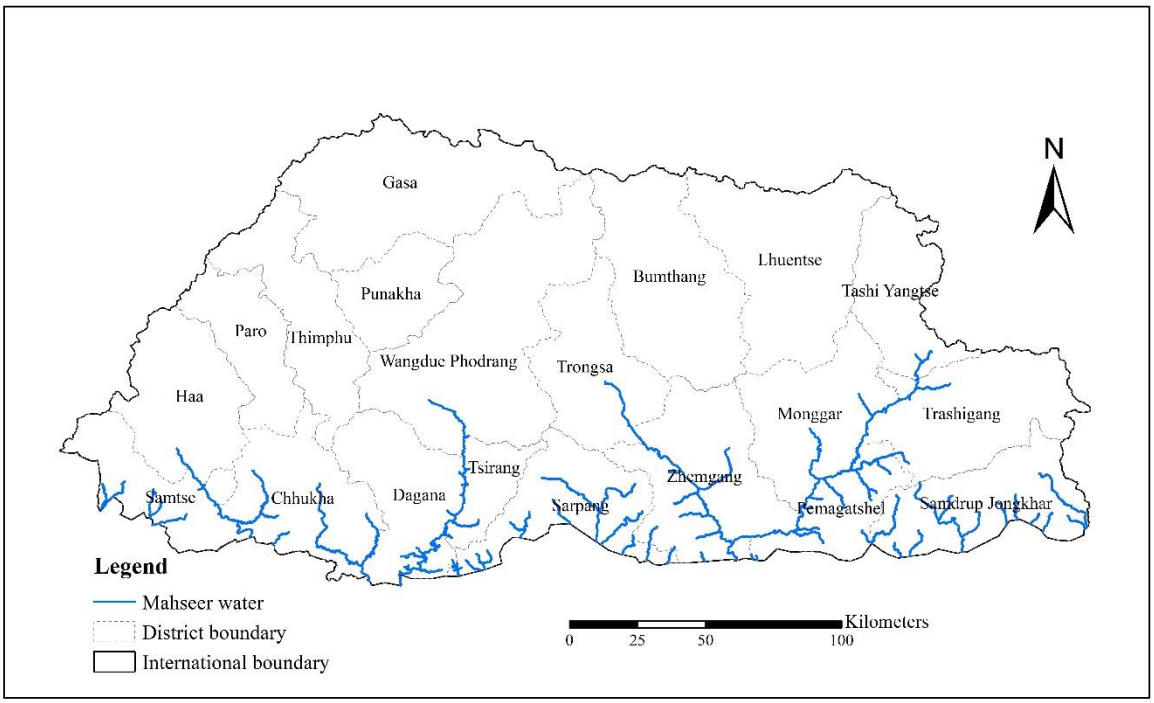

Figure 2. Map of Bhutan showing the delineated mahseer waters.

With the studies on Golden mahseer in Bhutan affirming a healthy population favourable for high-end recreational fishing, the amended regulation allows for fishing of Golden Mahseer exclusively for catch and immediate release. Therefore, in Bhutan recreational fishing for Golden mahseer shall be allowed by availing the Mahseer fishing permit from the Department of Forests and Park Services. However, as specified in the amended regulation, despite availing the permit, fishing shall be strictly prohibited in all prohibited sites and periods.

Within these delineated Mahseer water further delineation of High-end recreational fishing sites shall be done and notified by the Department as per the provisions of FNCRR (Amendment) 2022 under rule no. 272, as and when feasibility studies are completed. Unless such notifications of High-end recreational fishing sites are issued, all waters shall be treated as Normal fishing site, be it on Mahseer water or in Trout water.

Annexure I. Details of the delineated Mahseer waters of Bhutan

Sl. No.	Name of water/river	Starting point (Low elevation point)	End point (High elevation point)	Description (Description of starting point and end point, deviations)
1.	Sipsu river (Samtse)	26.958114° 88.885128°	27.034284° 88.884878°	The streth starts form the confluence of Sipsu-Jitti river and goes ends below Sipsu Hospital.
2.	Jitti river (Samtse)	26.951602° 88.877279°	27.041297° 88.958422°	The stretch starts from the Indo-Bhutan border and extends upstream for about 16 kms.
3.	Namchu river (Samtse)	27.022520° 89.216321°	27.015424° 89.200522°	The stretch starts from the Namchu Dovan and extends 2 kms up streams of Namchu.
4.	Somchu (Samtse)	27.027313° 89.214677°	27.031192° 89.221651°	The stretch starts from the confluence of Somchu-Amo chhu and extends for about 1 km on the stretch.
5.	Amochu (Chukha, Samtse)	26.858346° 89.368034°	27.150889° 89.129522°	The start point is at Toorsa at the southern Border under Chukha district and End point is at the base of Bebji village in Samtse.
6.	Pachhu River (Chukha)	26.908919° 89.332264°	27.077462° 9.377161°	The Start point is at Dovantar (Meet point of Amochhu Mahseer water and Pachhu). The end point is at Monodokha under Dungna Gewog, Chukha Dzongkhag
7.	Omchu River (Chukha)	26.935200° 89.403414°	26.929701° 89.460083°	The Omchu Rover start at Meet point of Pachhu and ends at Gemchu.
8.	Barsa River (Chukha)	26.838050° 89.443359°	26.875499° 89.496660°	The Start point is at Barsa (Pasakha) and end point is at Jumja under Gelling Gewog, Chukha Dzongkhag.
9.	Wangchhu (Chukha)	26.717208° 89.758926°	27.034140° 89.597539°	The start point is at Jigmechhu/Piping/Raidak at the southern border under Chukha Dzongkhag and end is at Wangkha/THPA Dam from where masher have no possibility to migrate due to lack of route).

10.	Getana Chhu (Chukha)	26.766715° 89.735277°	26.936874° 89.751426°	The start point is at the meet point of Wangchhu with Getana Chhu and end point is below Gangju Village, Getana Gewog, Chukha Dzongkhag.
11.	Punatshangchhu (Dagana/Tsirang/ Wangduephodrang)	26.703135° 89.861249°	27.309362° 89.955680°	The start point for Punatshangchhu mahseer water is from Sunkosh at the southern border under Lhamoizingkha, Dagana, and ends at the PHPA II Damsite. (109 kms).
12.	Khanew Khola (Dagana)	26.743588° 89.863692°	26.748233° 89.860322°	The site starts from Sunkosh-Khanew Khola conlfuence till 1 km upstream of Khanew Khola.
13.	Labrangkhola (Dagana)	26.750590° 89.897711°	26.762889° 89.874961°	The stretch starts from Sunkosh- Labrangkhola confluence till 3000m upstream of Labrangkhola.
14.	Sabrangkhola (Dagana)	26.751933° 89.897907°	26.767628° 89.889256°	The stretch starts from Sunkosh- Sabrang Khola confluence till the first confluence at the upstream of Sabrang Khola.
15.	Homakhola (Dagana)	26.789266° 89.945243°	26.796033° 89.864269°	The site starts from Sunkosh- Homa Khola confluence and goes up to Deorali Bridge (11 Kms)
16.	Samakhola (Dagana)	26.798650° 89.942969°	26.825604° 89.914451°	Within 1km distance upstream of Samkhola river from Samakhola-Sunkosh confluence.
17.	Rangakhola (Dagana)	26.866886° 90.005131°	26.876797° 90.004381°	Within 1km distance upstream of Rangakhola from Rangakhola- Sunkosh confluence.
18.	Pankeykhola (Dagana)	26.891529° 90.014062°	26.889522° 90.006614°	On the upstream of Pankeykhola from Pankeykhola- Sunkosh confluence till the confluence of streams.
19.	Dagachu (Dagana)	26.927464° 90.041347°	26.946847° 90.015767°	The stretch starts from Dagachu-Punatshangchhu confluence till Dagachu bridge.
20.	Budhichu (Dagana)	26.998303° 90.069078°	26.998264° 90.059317°	The site starts from Sunkosh- Budhichu confluence till 1 km upstream of Budhichu river at the Bridge.
21.	Bandarchhu	27.033017°	27.033017°	The site starts from

	(Dagana)	90.073017°	90.073017°	Sunkosh-Bandarchu confluence till 1000m upstream of Bandarchu.
22.	Tserichu (dagana)	27.065161° 90.068569°	27.073069° 90.054875°	The site starts from Sunkosh- Tserichu confluence till 2 km upstream of Tserichu.
23.	Nichula river (Dagana/PWS)	26.756800° 89.926028°	26.753171° 89.998378°	The Nichula river mahseer water is around 11.3 kms from the confluence of Nichula river and Sunkosh.
24.	Danasheykhola (Tsirang)	26.868384° 90.010136°	26.857634° 90.031555°	The stretch starts from the confluence of Danasheykhola and Punatshangchu and extends 3.5 kms on the Danasheykhola.
25.	Kalikhola (Tsirang)	26.912384° 90.032999°	26.916685° 90.118032°	The stretch starts from the confluence of Kalikhola and Punatsangchhu and covers around 13.5 km of the Kalokhola river.
26.	Changchey chhu (Tsirang)	27.031103° 90.073142°	27.034314° 90.082463°	The stretch is Changchey chhu is around 1.5 kms from the confluence of Changchey chhu and Punatshangchhu.
27.	Buri chhu (Tsirang)	27.077586° 90.074655°	27.084374° 90.088371°	The stretch starts from the confluence of Burichhu and Punatshangchhu and extends 2 kms.
28.	Neychu river (Tsirang)	27.139756° 90.066827°	27.139547° 90.067155°	The stretch starts from the confluence of Punatsangchu and extends almost 450 meters towards Sergithang geog.
29.	Harachhu (JSWNP/Wangdue)	27.184009° 90.070112°	27.192075° 90.085140°	The stretch starts from the confluence of Harachhu and Punatshangchhu and 2 kms upstream of Hara chhu.
30.	Kisonachhu (Wangdue/JSWNP)	27.219717° 90.071468°	27.222022° 90.074634°	It is 500 meters upstream on the Kisona chhu from the Kisona chhu – Punatshangchhu confluence.
31.	Pinkhowa chhu (Dagana/PWS)	26.731861° 90.053731°	26.786104° 90.031988°	The Pinkhowa chhu and its tributaries measuring 1.5 – 3 kms constitute mahseer water in PWS.
32.	Phibsoo river (Sarpang/PWS)	26.750073° 90.125209°	26.783703° 90.077049°	The stretch measures around 7.3 kms from the international border on the Phibsoo river.

33.	Longa chhu (PWS)	26.754275° 90.140132°	26.817635° 90.146990°; 26.804672° 90.111290°	The stretch starts from the international border and extends 10.2 kms. Its tributary on the right extends further 5 kms.
34.	Sarpang khola (Sarpang)	26.858352° 90.255838°	26.942634° 90.284696°;	The stretch starts from the international border and extends till below the Menchulum BHU.
35.	Loringchhu (Sarpang)	26.889350° 90.269586°	26.909006° 90.220997°	It is the tributary of Sarpang khola and extends from the confluence for about 9 kms.
36.	Bhurkhola (Sarpang)	26.904545° 90.416762°	26.981896° 90.361401°	The stretch starts from the international border at Burgaon and extends for about 11.5 kms near the natural salt lick area.
37.	Maokhola (Sarpang)	26.847171° 90.502842°	27.054410° 90.325910°	The Maokhola mahseer water stretch starts from the international border below Gelephu and extends till a smaller confluence below Bitana village.
38.	Rongkhola (Sarpang)	26.946586° 90.510489°	27.034567° 90.632033°	The Rongkhola stretch starts from the confluence of Maokhola and Rongkhola and extends towards Tamala about 27 kms.
39.	Taklaikhola (Sarpang)	26.835601° 90.519422°	26.944633° 90.654783°	The stretch starts from the international border and extends till Noonpani.
40.	Sukuntaklai (RMNP)	26.802782° 90.589913°	26.866583° 90.624050°	The stretch starts from international border and extends till up above a Sukuntaklai top.
41.	Karnamukura (RMNP)	26.784046° 90.671372°	26.894833° 90.704100°	The stretch starts from the international border and ends near Edi village.
42.	Kukulung river (RMNP)	26.771344° 90.733665°	26.828550° 90.761269°	The stretch starts from international border and extends till up above a temple.
43.	Gobarkunda (RMNP)	26.780200° 90.862000°	26.810067° 90.847467°	The stretch starts from the international border and extends 2.73 kms upstream.
44.	Manas river (RMNP)	26.783858° 90.957922°	26.837839° 90.949272°	It starts from across the international border and extends till the confluence of Mangde chhu and Drangme chhu.

45.	Mangdechhu (Zhemgang/Trongsa)	26.837839° 90.949272°	27.371035° 90.533089°	This is one of the longest stretches of Mahseer water which starts from the manas river and ends at the Mangdechhu Project power house.
46.	Udigang river (RMNP)	26.878769° 90.910392°	26.856583° 90.833067°	It starts from the confluence of Udignag river and Mangde chhu and extends to a smaller confluence in the forests.
47.	Vedhagang chhu (RMNP)	26.933150° 90.869933°	26.926950° 90.778367°	It starts from the confluence of Vedangchhu-Mangdechhu near Shamshama bridge and extends to a smaller confluence in the forests.
48.	Rendebi river (RMNP)	27.004967° 90.837217°	26.969967° 90.759533°	It starts from the confluence of Rindebii-Mangdechhu near Rindebii bridge and extends into the forests.
49.	Changdigang river (RMNP)	27.079250° 90.780433°	27.074283° 90.743500°	It starts from the confluence of Changdigang-Mangdechhu and extends up into the forests towards Subrang village.
50.	Nabji chhu (JSWNP/Trongsa)	27.225199° 90.614109°	27.224804° 90.609181°	It starts from the junction of Nabjichhu and Mangdechhu and extends 0.5 km on the Nabji chhu.
51.	Chamkhar chhu (Zhemgang/Bumthang)	27.018233° 90.839644°	27.151564° 90.939958°	The stretch stars from the confluence of Chamkhar chhu and Mangdechhu at Rendibi and ends at Pritigang confluence (Torong)
52.	Wangdigang chu (Zhemgang)	27.218033° 90.619503°	27.218864° 90.620815°	The stretch starts from the junction of Mangduechu and Wangdigang chhu and the endpoint stretched to around 200 meters from the confluence.
53.	Drangme chhu (Zhemgang/Mongar/ Pemagatshel/Trashigang/ Trashiyangtse)	26.837839° 90.949272°	27.433808° 91.574179°	Drangme chhu mahseer water stretch is the longest stretch of mahseer water in Bhutan. It starts from Zumzumi confluence (confluence of Mangdechhu and Drangmechhu) and extends all the way to the confluence of Kholongchhu

				and Gongri river.
54.	Kurichhu (Mongar)	27.049454° 91.236185°	27.216104° 91.203399°	The stretch starts from the confluence of Kurichhu and Drangmechhu and extends till the Kurichhu Dam.
55.	Sherichhu (Mongar)	27.252845° 91.410231°	27.329481° 91.365116°	The stretch starts from the confluence of Sherichhu and Drangmechhu and extends till the Bridge across Sherichhu at about 10.7 kms.
56.	Kholongchhu (Trashiyangtse)	27.433808° 91.574179°	27.459553° 91.550942°	The stretch of about 4 kms starts from confluence of Kholongchhu and Gongri.
57.	Kerong river (Pemagatshel)	26.880059° 91.149248°	26.840433° 91.248901°	The stretch starts from the junction of Kerong river and Drangmechhu and extends up till Nganglam town.
58.	Kurung river (Pemagatshel)	26.885224° 91.161580°	26.886930° 91.234638°	The stretch starts from the confluence of Drangmechhu and Kurung river and extends up about 9 kms till the Kangrizay bridge.
59.	Sokporung (Pemagatshel)	26.962175° 91.178746°	26.956814° 91.209202°	The stretch starts from Yangbari and extends up along the Sokporung river for about 3.5 kms below the Mikuri village.
60.	Brongri (Pemagatshel)	26.991885° 91.204534°	26.986007° 91.246093°	The stretch starts from the confluence of Drangme chhu and Brongri stream and extends up to the Baenongonpa village under Dungmaed gewog
61.	Yuri (Pemagatshel)	27.052319° 91.251703°	26.954577° 91.317470°	The stretch starts from the confluence of Drangmechhu and Yuri stream and extends up to the Woongborang village covering Chimung and Dungmaed gewog
62.	Demri (Pemagatshel)	27.080446° 91.342223°	27.101697° 91.529014°	The stretch starts from the confluence of Drangmechhu and Demri River and extends up to Nanong gewog.
63.	Uri (Pemagatshel)	27.080380° 91.355956°	26.980972° 91.405353°	The stretch starts from the confluence of

				Demri River and Uri stream and extends up to the Tsebar village under Khar gewog
64.	Marungri (Pemagatshel)	27.016147° 91.396666°	27.005070° 91.424328°	The stretch starts from the confluence of Uri stream and Marung stream and extends up to the Mawa village under Shumar gewog
65.	Tshalari (Pemagatshel)	27.114535° 91.420973°	27.067284° 91.468799°	The stretch starts from the confluence of Demri River and Tshalari stream and extends up to Zobel gewog
66.	Khengrii (Trashigang)	27.280987° 91.447418°	27.268748° 91.452290°	The stretch starts from the confluence of Drangmechhu and Khengrii and extends 2 kms upstream.
67.	Rollong Rii (Trashigang/Mongar)	27.308672° 91.498137°	27.313663° 91.496939°	The stretch starts from the confluence of Rollong river with Drangmechhu and extends about half km upstreams.
68.	Bamri river (Trashigang)	27.323339° 91.529566°	27.311590° 91.531534°	It is a 1.6 km stretch from the confluence of Drangmechhu and Bamri.
69.	Gamri river (Trashigang)	27.348907° 91.551468°	27.362912° 91.664943°	The stretch along Gamri river starts from Drangmechhu confluence and ends at Rangjung bridge.
70.	Jamkhar drang (Trashigang)	27.376330° 91.558276°	27.373239° 91.551317°	It is a 1 km stretch on the Jamkhar river from its confluence with Drangmechhu.
71.	Gongri river (Upper Drangme chhu) (Trashiyangtse)	27.433808° 91.574179°	27.465168° 91.604173°	The stretch starts from the confluence of Gongri with Kholongchhu and ends 6.3 kms upstream.
72.	Ribalingmo (RMNP)	26.786683° 91.019067°	26.803633° 91.011100°	It starts from the Indo-Bhutan border and extends up towards the north from behind the Norbugang hills.
73.	Richanglu (RMNP)	26.784967° 91.030333°	26.798983° 91.028050°	It starts from the Indo-Bhutan border and extends up towards the north from behind the Norbugang hills.
74.	Khalatsho river	26.835575°	26.882859°	The starting point for this

	(Samdrupjongkhar/ Pemagatshel)	91.410008°	91.375264°	stretch is at Indo-Bhutan border and ends below Khalatsho village 3.29km upstream.
75.	Deori river (Samdrupjongkhar)	26.838908° 91.408022°	26.998639° 91.489614°	The stretch starts from the confluence of chowki near Indo-Bhutan border and ends below Melong brak, above Remung village, Orong Gewog.
76.	Dungsam chhu (Samdrupjongkhar)	26.794150° 91.506333°	26.841078° 91.482878°	The stretch starts from Indo-Bhutan border and extends till Garpowong.
77.	Martang river (Samdrupjongkhar)	26.797953° 91.535147°	26.882844° 91.560719°	The stretch starts from Indo-Bhutan border at Motanga and ends above Martang village.
78.	Nyera ama chhu (Samdrupjongkhar, JWS)	26.814342° 91.704752°	27.038194° 91.564525°	The stretch starts from the Indo-Bhutan border and ends below Broomi village.
79.	Diglai chhu (JWS)	26.860389° 91.702601°	26.942345° 91.759975°	It starts below Khamethang village at the confluence of Diglaichhu and Nyera ama achhu and ends at Lingmithang where there was artificial lake due to landslide.
80.	Retsongri river (JWS)	26.917622° 91.626983°	26.995515° 91.671587°	The stretch starts from the confluence of Nyera amachhu and Retsong river and extends little above Kakani village.
81.	Kalanadi chhu (JWS)	26.900741° 91.849134°	26.973837° 91.815922°	The stretch starts from the international border at Kalanadi grassland and ends above Cortso where there is artificial lake due to landslide.
82.	Nunai chhu (JWS)	26.916586° 91.884034°	26.999519° 91.879565°	It starts from the international border at Nunai grassland and ends at a deep gorge below Larjab.
83.	Borola chhu (JWS)	26.903319° 91.928652°	26.937675° 91.955134°	It starts at the international border at Borola and ends at landslide area above saltlick site.
84.	Kherkheria chhu (JWS)	26.875238° 91.968166°	26.939498° 91.997934°	The stretch starts from the international border at Kherkheria and extends about 9 nines until above the wildlife habitat

				management site.
85.	Chu karpo river (JWS)	26.889585° 92.110085°	26.930004° 92.049559°	The stretch starts at the international border below Jomotsangkha industrial area and ends at the Tsangpurung habitat management site.
86.	Jomochhu (JWS)	26.894433° 92.114880°	27.069734° 91.956371°	The stretch starts from the international border below Shiv Mandhir and ends at Lungko, a gorge below Gawaling.

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