

*Discussion on the Impact of Plastic
Pollution in Rivers on Fisherfolk in Purba
Medinipur, West Bengal, India*

Venue: Mahishadal Raj College, Mahishadal, Purba
Medinipur

3 June 2025

Report

Prepared by
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A discussion on Plastic Pollution in Rivers was organized by Purba Medinipur Matsyajibi Forum (PMMF) in collaboration with the Society for Direct Initiative for Social and Health Action (DISHA), Zoology Department, Mahishadal Raj College, and Break Free from Plastic (BFFP). The discussion was titled “Our Rivers, our Livelihood: Plastic Pollution of Rivers and effect on fisherfolk.” The discussion was aimed at sharing of knowledge and information between the fishing community, researchers, students, and civil society in general.



Workshop Banner

Programme schedule

Pre-lunch session

10:00 AM to 11: AM – Inaugural session: Opening ceremony and inaugural presentations.

11:00 – 11:30 a.m. – Group Activity

11:30 a.m. – 12:00 p.m. – Presentation on the Impact of Plastics on Fisheries

12:00 – 12:20 p.m. – Experience Sharing and Listening Session

12:20 – 1:00 p.m. – Lunch Break

Post-Lunch Session

1:00 – 2:00 p.m. – Presentation of Thoughts/Speeches by Groups

2:00 – 3:30 p.m. – Speech by Aswathi Senan, Break Free From Plastic

3:30 p.m. – Vote of Thanks

Inaugural Session

Session Moderator: Debasis Shyamal, Secretary, Purba Medinipur Matsyajibi Forum.

Chair: Subhamoy Das, Head, Zoology Department, Mahishadal Raj College.

Guests: Aswathi Senan, Break Free from Plastic (BFFP), Santanu Chacraverti, President, Society for Direct Initiative for Social and Health Action (DISHA)

Other Participants: Riverine fishers from various CD Blocks of Purba Medinipur District, teachers and students from the Zoology Department of Mahishadal Raj College, few other interested local persons, and other members of PMMF or DISHA.



A view of the participants

Debasis Shyamal flagged off the discussion by mentioning the problems faced by fisherfolk due to plastic and other forms of water pollution, which they feel are leading to the depletion of fish in rivers and the sea. He further said that this discussion had been conceived after the river fishers had mentioned the huge problem they were facing in various meetings. He further, clarified that the PMMF is an organisation of small-scale fish workers engaged in fishing in the rivers, sea and in fish farming (except intensive shrimp culture) in Purba Medinipur District. He emphasized that the fisherfolk attending the event were all engaged in the work of small-scale fishing on rivers,

undertaken from manually operated boats or boats fitted with low-powered motors. He further stated that the PMMF was not fully equipped to tackle the issue of plastic pollution in rivers and sea. Although the fisherfolk have learnt to live with the pollution, this has been hugely affecting their livelihood. Therefore, the PMMF has been compelled to arrange this discussion in collaboration with partners better equipped to deal with the issue. The purpose of holding the discussion with the Zoology department of Mahishadal Raj College was that the Department, and particularly its present Head of the Department, has been a friend of PMMF for a long time. The relationship took off with the anti-nuclear movement at Haripur and has continued through various initiatives. Thereafter, he introduced the panel for the discussion consisting of Subhamoy Das, Head of Department, Zoology Department, Mahishadal Raj College, Ashwathy Senan from Break Free from Plastic, and Santanu Chacraverti, President, DISHA.



Debasis Shyamal

After this, the inaugural ceremony was performed by the students of Mahishidal Raj College.

Aswathy Senan (BFFP) gave the first address of the inaugural session. She introduced herself as a representative of Break Free from Plastic, which works with people affected by plastic pollution in this country and abroad. She stressed on the fact that the use of plastic as a product was widely prevalent in the world mostly because it was durable. However, it was precisely this durability that was a major reason for plastic to emerge as a huge environmental problem. Plastic products do not decompose for 100-200 years, or even 500 years, even the ones used just once by a consumer. The speaker introduced the work that the BFFP does—ranging from research to campaign and possible interventions in all the stages of plastic production, use and recycling. She stated that she was excited by the fact that fisherfolk have come together to tackle the issue of plastic pollution and she was looking towards further collaboration with them.



Aswathy Senan

Santanu Chacraverti (DISHA) mentioned the first speaker's emphasis on the huge environmental problem posed by the durability of plastic and drew on it. He mentioned that, in nature, things were characterised by decomposability—everything, including our own bodies, were decomposed and ceased to be a problem for nature. However, plastic resisted decomposition, and this

contributed towards making it a major problem. The problem was accentuated by the fact that plastic waste was not harmless; On the contrary, the chemicals that went into the making of various kinds of plastic caused numerous problems for the environment and human life. Recalling the lyrics of the Tagore song that had been sung during the opening ceremony, he said that both the zoology department and the fisherfolk dealt with life—the zoology department studied life and biodiversity on this planet, while the fisherfolk subsisted on aquatic life and biodiversity; and that life and biodiversity on this planet was being threatened by several environmental problems, a major one among them being plastic pollution. Hence, the coming together of the Zoology Department, the fishing community, and two environmental activist organizations was a significant moment.



Santanu Chacraverti

Subhaomoy Das, started his speech by saying that he was delighted to host a discussion that was people-centric and action oriented, rather than being a mere academic exercise. He stated that the learning acquired by people through their everyday experiences had a value that was sometimes ignored in academic ventures, and he was delighted to keep his foot on the ground while talking about issues of plastic pollution. He gave an allegory of a play, in which we all were players, and

which had been prepared and orchestrated by five artists, each starting with the with the letter P—namely, Plastic, Politics, Population, Poverty, and Pollution—and the main protagonist in the play was greed. Need was limited but greed was unbounded. Therefore, the five P's and the chief protagonist were expertly working together to destroy the planet as we know it.

The speaker further pointed out that in thinking of our environment, we had forgotten to attend to our aquatic spaces—the rivers, the wetlands, and the marine waters. Yet, these played a pivotal role in our planetary environment—more so than terrestrial spaces. For example, the phytoplankton in the seas and oceans, rather than the trees in our forests, were the most important biological agents for sequestering carbon and releasing oxygen. But these phytoplankton were being adversely affected by the plastic pollution of the marine waters. He highlighted that global temperature rise was more evident in the ocean than on land surfaces and caused the release of carbon dioxide in the atmosphere. He further elucidated that the plastic that has been produced so far on earth had not decomposed, as it took 500 years for plastic to decompose on earth. On the other hand, if plastics were burnt, then they released carcinogenic gases such as dioxin, which were extremely dangerous to all forms of life. All the plastic in the world finally ended up in the ocean, either on the ocean floor or on the water surface. Plastic broke down into microplastics, which were ingested by animal life. A small portion of ocean water contained millions of microplastics when viewed under a microscope. He stated that, scientific research indicated that intrusion of nanoplastic and microplastic caused enhanced testosterone-like effects in fish species, which was causing an imbalance in the male-female ratio of the fish population, including that of Hilsa fish found in the waters in South Bengal. The speaker further predicted that all marine life was undergoing such sex change due to intrusion of nano-plastic and microplastic in their digestive system and finally into their various organs.



Shubhamoy Das

The adverse effect on the aquatic environment and fish species was first experienced by the fisherfolk, particularly the small-scale fishers. Their suffering remains unnoticed and their voices unheard. The speaker challenged the concept of ‘recycling’ plastics—he argued that plastics did not and could not undergo proper recycling as the attempts to recycle plastics resulted in reduction in both quantity and quality. Hence, in most cases, the material was not retrieved in its original form and quantity. Therefore, plastic was not really recycled but was ‘downcycled.’ This was in stark contrast to materials like metals and glass, which could be genuinely recycled.

He said that one million plastic bags were dumped every minute and found their way to natural waters and ended up in the seas and oceans. They were broken down into fine particles we know as microplastics and nanoplastics. Mistaking these as plankton, the fishes ingested large quantities of these particles. This caused malnutrition and weakening of the fish and thwarted movement and migration, resulting in massive disruption of aquatic ecosystems, fish demography, and depletion of available fish stock.

Alternatives to plastic were not viable at this moment since such proposed alternatives did not have the longevity of plastic but in this respect his department was trying to create a substitute using chitin¹ and corn by-product materials to invent a new form of durable material that could be used at large. He said finding viable alternatives and having them replace plastic would not happen in a day, but it was bound to happen someday. He further spoke of coastal pollution that was ending up in the oceans. He mentioned an experiment conducted in Presidency University at Kolkata where a small dose of microplastic was introduced in a controlled environment in an aquarium, which contained a single female zebra fish. It was discovered that after the introduction of plastic in the water, the fish had developed numerous cysts in its ovaries after 45 days. He said that evidently the prevalence of polycystic ovaries in humans was also due to plastic pollution. Depletion of fish species and overabundance of plastic had increased fishing time for the traditional fisherfolk many times. He concluded by stating that unless such concerns were raised before the appropriate authority and society at large, these problems would not be addressed.

¹ Pronounced “kytin.”

Second session: Group Discussion

The members of the fishing community divided into small groups based on fishing areas (different rivers or different parts of the same river). The groups were presented with a questionnaire targeted at identifying their problems with respect to plastic pollution. The groups discussed the questions and formulated their responses. Students of the department helped them write down their replies. (They had been advised to try to capture the actual words and spirit of the replies of the group and the organisers made rounds of the sessions to see that things went smoothly and to the purpose.) The responses have been translated and are given below, preceded by some pictures of the occasion:

GROUP A

Fishers fishing on Hooghly River (from Diamond Harbour to Geonkhali)



Debasis Shyamal explaining the group activity to Group A



Group A—Presentation and Discussion

1. It is said that plastic causes various problems in river fishing. In what specific ways does it cause problems?

Ans: Plastic waste is getting trapped in fishing nets, causing damages to the nets. Plastic wastes include disposable teacups, plastic bottles, fiberglass, etc. Plastic wastes accumulate on the riverbeds and are ingested by animals.

2. You have mentioned that plastic gets caught in fishing nets. If that is true, what types of plastic are being caught (e.g., carry bags, plastic cups, other plastic packets, other plastic items, etc.)?

Ans: Apart from the plastic wastes mentioned in response to the first question the following plastic waste are also found while fishing

- i. Buckets made of plastic,
- ii. plastic toys and plastic balls,
- iii. fast food wrappers,

3. What is the quantity of plastic being caught? (If measured by weight, it may not give the full picture of the plastic problem. In that case, you may try to describe the quantity in some other way.)

Ans: 200 to 300 pieces of disposable plastic cups are found per catch of fishing, similarly 100-200 plastic bottles are found per catch, 40-50 pieces of polythene papers, foam bags, foam slippers (shoes).

4. Below are several environmental problems affecting the fishing livelihood. Among these, where would you rank the problem of plastic pollution? Please rank the issues in order of severity (1, 2, 3...):

- I. Plastic pollution/Water pollution
- II. Navigation problems due to boat/ship traffic
- III. Riverbank erosion
- IV. Use of “behundi” (fixed) nets in rivers
- V. Destructive fishing practices (use of poison/electric shock, mosquito nets, etc.)
- VI. Decline in fish population
- VII. Brick kilns on riverbanks
- VIII. Sand mining

If you have anything to add besides the answers to the above questions, please do—

Other problems that are mentioned by this group of fisherfolk are as follows:

- a. The issue of parking boats during stormy weather
- b. The issue of damages to nets
- c. Sometimes tree logs are dropped in the rivers which further causes damages to the nets.

During discussion, it was further mentioned that during the monsoon season the prevalence of plastic is higher in comparison to other seasons.

GROUP B

Fishers fishing on upstream Rupnarayan River (in and around the Kolaghat area)



Discussion with the Students



Group B—Presentation and Discussion

1. It is said that plastic causes various problems in river fishing. In what specific ways does it cause problems?

Ans: Due to plastic pollution fish, fries and underwater life forms in general are affected, which in turn affects the livelihood of small-scale fish workers. Secondly, lodges, banquet halls, resorts and other such commercial properties “use the rivers as waste bins” as they dump all their waste in the river.

2. You have mentioned that plastic gets caught in fishing nets. If that is true, what types of plastic are being caught (carry bags, plastic cups, other plastic packets, other plastic items, etc.)?

Ans: The following items are prevalent during fishing in this area of the river:

- a. plastic carry bags
- b. disposable plastic cups
- c. Diapers and sanitary napkins

- d. other plastic packets/pouches
- e. other plastic items

3. What is the quantity of plastic being caught? (If measured by weight, it may not give the full picture of the plastic problem. In that case, you may try to describe the quantity in some other way.)

Ans: For every one basket/bucket of fish, 2 baskets/bucket of plastics are found while fishing in the said river.

4. Below are several environmental problems affecting the fishing livelihood. Among these, where would you rank the problem of plastic pollution? Please rank the issues in order of severity (1, 2, 3...):

- I. Destructive fishing practices (use of poison/electric shock, mosquito nets, etc.)
- II. Sand mining
- III. Water pollution/ Plastic pollution
- IV. Decline in fish population
- V. Navigation problems due to boat/ship traffic
- VI. Riverbank erosion
- VII. Brick kilns on riverbanks
- VIII. Use of “behundi” (fixed) nets in rivers

5. If you have anything to add besides the answers to the above questions, please do share

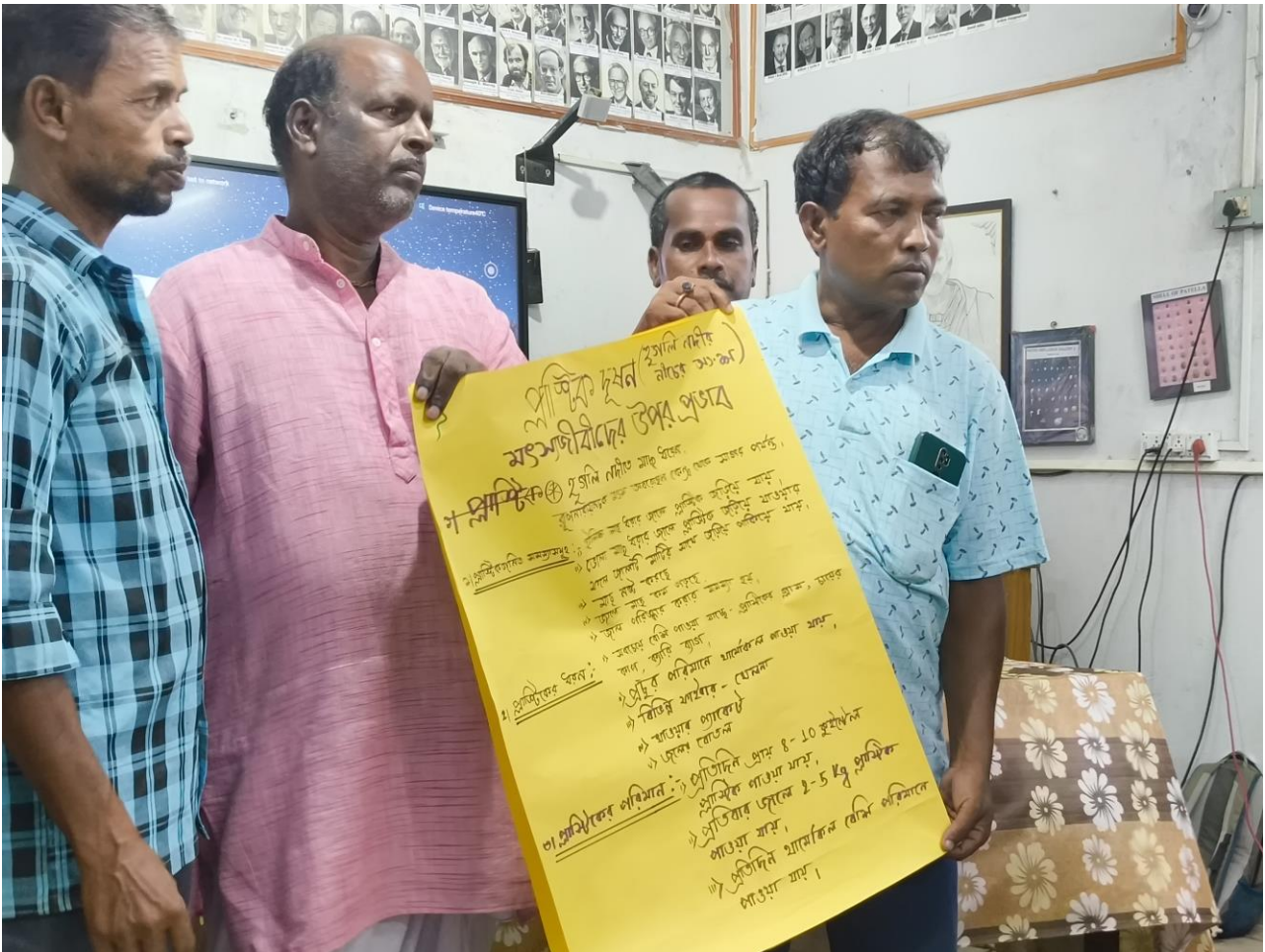
No response

GROUP C

Fishers fishing on the lower stretch of Hooghly River (near Haldia)



A teacher talking to a group



Group C—Presentation and Discussion

1. It is said that plastic causes various problems in river fishing. In what specific ways does it cause problems?

Ans: Plastic pollution is causing the following problems in this area of the river:

- Plastic wastes are caught on fishing nets—the types as mentioned in reply to question no. 2
- Huge quantities of plastic waste are causing water pollution in this area of the river.
- Due to such plastic waste accumulation in the river, fish are becoming scarce in this area of the river
- Decline of fish population is causing economic crisis for the small-scale fish workers

2. You have mentioned that plastic gets caught in fishing nets. If that is true, what types of plastic are being caught (carry bags, plastic cups, other plastic packets, other plastic items, etc.)?

Ans: The following items are caught during fishing:

- a. Surgical equipments made of plastic materials such as saline bottles, syringes, tubes, etc.,
- b. Plastic wrappers,
- c. Plastic glasses,
- d. Thermocol² pieces,
- e. Disposable plastic cups,
- f. Plastic bottles
- g. Plastic carry bags

3. What is the quantity of plastic being caught? (If measured by weight, it may not give the full picture of the plastic problem. In that case, you may try to describe the quantity in some other way.)

Ans: 10 to 15 buckets of plastic waste are caught for every two hours of fishing in this area of the river.

4. Below are several environmental problems affecting the fishing livelihood. Among these, where would you rank the problem of plastic pollution? Please rank the issues in order of severity (1, 2, 3...):

- I. Water pollution/Plastic Pollution
- II. Riverbank erosion
- III. Sand mining
- IV. Destructive fishing practices (use of poison/electric shock, mosquito nets, etc.)

If you have anything to add besides the answers to the above questions, please do—

We urge the appropriate authorities to ensure that plastic pollution is completely curbed in the river and water bodies. We further request appropriate authorities to compensate the small-scale fish workers during the ban period of fishing activities.

² Polystyrene

GROUP D

Fishers fishing on the downstream of the Rupnarayan River



Discussion with the students



Group D—Presentation and Discussion

1. It is said that plastic causes various problems in river fishing. In what specific ways does it cause problems?

Ans: Plastic wastes when caught in fishing nets cause reduction in the total catch of fish, especially Hilsa. Thus, due to plastic pollution, both fishes and fishing are affected. Even the fishing nets get damaged due to plastic pollution.

2. You have mentioned that plastic gets caught in fishing nets. If that is true, what types of plastic are being caught (carry bags, plastic cups, other plastic packets, other plastic items, etc.)?

Ans: The following types of plastic waste are found during fishing:

- a. Plastic glasses, carry bags, disposable plastic cups
- b. Thermocol pieces and thermocol waste
- c. Plastic toys
- d. Plastic wrappers and plastic food packets
- e. Plastic bottles

3. What is the quantity of plastic being caught? (If measured by weight, it may not give the full picture of the plastic problem. In that case, you may try to describe the quantity in some other way.)

Ans: Every boat catches 8-10 quintals of plastic wastes and every catch of fishing accumulates 2-5 kgs of plastic. Among plastic waste, thermocol waste is most prevalent

4. Below are several environmental problems affecting the fishing livelihood. Among these, where would you rank the problem of plastic pollution? Please rank the issues in order of severity (1, 2, 3...):

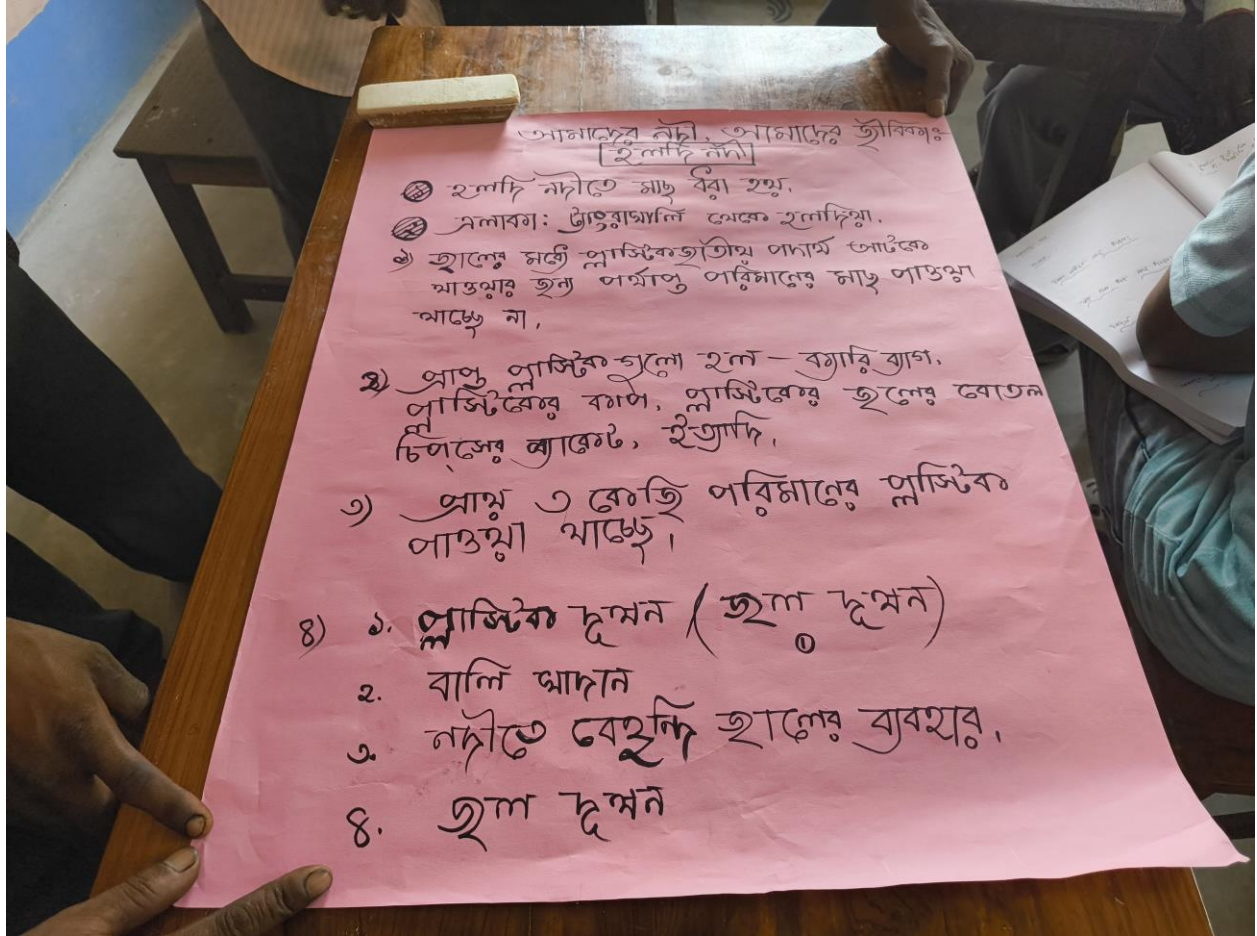
- I. Plastic pollution
- II. Water pollution due to dumping of industrial waste
- III. Brick kilns on riverbanks
- IV. Riverbank erosion
- V. Navigation problems due to boat/ship traffic
- VI. Destructive fishing practices (use of poison)
- VII. Use of “behundi” (fixed) nets in rivers
- VIII. Destructive fishing practices (mosquito nets)
- IX. Decline in fish population due to deaths caused by ingestion of plastic by the fishes

5. If you have anything to add besides the answers to the above questions, please do share

No response

GROUP E

Fishers fishing on the Haldi River



Students writing down the discussion points for presentation



Group E Presentation and Discussion

1. It is said that plastic causes various problems in river fishing. In what specific ways does it cause problems?

Ans: Due to accumulation of plastic waste in the rivers adequate fishing is becoming untenable for the small scale fish workers.

2. You have mentioned that plastic gets caught in fishing nets. If that is true, what types of plastic are being caught (carry bags, plastic cups, other plastic packets, other plastic items, etc.)?

Ans: The items that are widely caught in the fishing nets are:

- a. carry bags,
- b. plastic cups,
- c. plastic bottles
- d. other miscellaneous plastic packets and items

3. What is the quantity of plastic being caught? (If measured by weight, it may not give the full picture of the plastic problem. In that case, you may try to describe the quantity in some other way.)

Ans: Almost 3 kg of plastic waste are found in the fishing nets per catch.

4. Below are several environmental problems affecting the fishing livelihood. Among these, where would you rank the problem of plastic pollution? Please rank the issues in order of severity (1, 2, 3...):

Plastic pollution

Sand mining

Use of “behundi” (fixed) nets in rivers

Water Pollution

Destructive fishing practices (use of poison/electric shock, mosquito nets, etc.)

Riverbank erosion

Brick kilns on riverbanks

5. If you have anything to add besides the answers to the above questions, please do share

No response

Third /Afternoon session

The session began with a few preliminary words on the effect of plastic on fish species by Rajkumar Guchhait.

Based on the information provided by the various groups of fishers, the Department of Zoology, Mahishadal Raj College declared their willingness to work with the fishing community and environmental activists to collect systematic information on plastic waste in the rivers.



Rajkumar Guchhait



Ashwathy Senan presentation. Translated by Santanu Chacraverti

Aswathy Senan stated that placed in the context of the discussion on plastics being carried out internationally and in our own country, the presentation and discussions that had taken place in this workshop were genuinely insightful in terms of the pollution caused by plastic products. She pointed out that the group presentations had yielded a form of waste audit, as the fisherfolk had given a broad estimate of the quantity and kinds of plastic products that are dumped in the rivers. She mentioned that similar depictions emerged when waste cleaning efforts took place on special occasions at beaches or hill sites and we see pictures of huge loads of waste that have been collected. These give us a sense of how our country is getting polluted.

The speaker then spoke on the need of including the approach of brand audit in the method of collecting and analysing the data on riverine plastic waste being planned by the department and the fishing community. The speaker explained brand auditing as auditing plastic waste not only in terms of the kinds and quantity of plastic materials, but also with an eye for the brands displayed on the products or the packages, thereby identifying the producer firms/companies that produced them. She highlighted one study undertaken by Break Free from Plastic and GAIA, where the waste audit focused on brands widely prevalent in the heaps of plastic waste. Through this brand

audit they could identify some of the polluters like Coca-Cola, Unilever or PnG. One often identifies countries that are major sources of plastic pollution, but it is important to identify the actual entities that were actual sources of the waste.

Next, Aswathy Senan drew attention to our perception of plastic pollution only in terms of waste. She pointed out that this perception prevented one from remembering the upstream of plastic production—which began with the extraction of petroleum and proceeded through the various stages of petrochemical production and marketing. The process of extraction, of course, carried heavy environmental costs and the subsequent stages of petrochemical production and processing were also heavily polluting. When fishers were speaking of pollution of the waters at Haldia, they were referring to the pollution caused by petrochemical industry at Haldia. But they did so unwittingly, as a result of which they were making a difference between plastic pollution (which, they saw in the form of troublesome waste) and water pollution from the Haldia factories. It is important, therefore, to be able to combine these two in our narrative to present the environmental costs of plastic in a more complete light.

The speaker next critiqued the myth of plastic recycling and the talk of some plastic producers that their products were hundred percent recyclable. She pointed out that only 9% of the plastic produced so far has been recycled. Many plastic products ended up as waste sent to energy plants or cement kilns. Moreover, petrochemical industries produced not merely plastics but other environmentally hazardous chemicals such as agrochemicals (including fertilizers) used in farming. Moreover, farming utilized plastics in a big way in such practices such as mulching. These become a component of the plastic waste in villages. Thus, plastics and other petrochemicals, during the entire process of consumption, use, and disposal, are responsible for various kinds and levels of pollution of the water, soil, marine life, terrestrial life (including humans), and of the planet as a whole.

Aswathy also drew attention to hazards involved in the transport of plastic pellets³ from one country to another. Shipping accidents resulted in the loss of huge quantities of plastic pellets in the sea—another major source of plastic pollution. She gave two examples of such hazards. Firstly, she spoke of an accident that occurred in Sri Lanka in 2016 where a ship caught fire and large quantities of plastic pellets were lost in the sea and affected the lives of marine fisherfolk in the area for many years. There was an event on 25 May this year, when a Liberian container ship sank off the coast of Kochi after encountering heavy weather. The vessel was carrying 640 containers out of which 100 containers of plastic pellets also drowned in the sea. In this connection, the speaker mentioned a land-based occurrence, a break-out of fire in the oil refinery in Numaligarh, where air and water were affected. Thus, whether accidents involving plastic shipments or involving petrochemical refineries, the hazards related to plastics were not confined to plastic waste. Therefore, we were dependent on our friends from the scientific community to help us understand the interconnections and the perils better.

³ These are the primary raw material in the manufacture of a wide range of plastic products.

The speaker also mentioned that in Kerala there was an effort to include the fisherfolk in the sea cleaning programme, where the fishers who were getting plastic huge amounts of ‘plastic catch’ on their nets were asked to bring back the plastic instead of throwing it back into the water, and for this they were compensated. Thus, they acted as waste collectors and cleaners in this programme. She also raised the question whether in such programmes to clean up water bodies, fishers could also act as waste collectors and could get some compensation for their losses and time spent in hauling the plastic. This involved a certain shift in the occupation of fisherfolk at least as part time waste collectors, and the speaker left it as a question whether the fishers could or would be willing to make this shift.

In this context, the speaker also spoke of including brand audit of the plastic waste collected from the water bodies by the fishers and this could pave the way to identifying the major polluting companies putting up pressure on them and the authorities to have the companies redesign their packaging.

A tentative decision emerged during this session that a joint effort by the riverine fishing community, the college faculty and students to systematically collect, classify, study and analyse the plastic waste data as a springboard to further research and campaigns. To this end, it was decided that a WhatsApp group involving all concerned would be made.

Concluding session

The meeting concluded with concluding remarks from the organisers and the hosts and a vote of thanks.