

**Report on Stakeholder Consultation Community Workshops for Forever Segama:
“Citizen Science: Water Quality, Riparian Biodiversity and Fisheries”
16 – 18 July, 2020**

This report serves to document the outcomes of this workshop with two clusters of a total of six villages along the Segama River in the period of 16 – 18 July 2020 with careful adherence to the Recovery Movement Control Order SOPs.

Forever Sabah Team Participants

1. Casey Ng
2. Rosli Hj Jukrana
3. Philip Chin
4. Claudia Lasimbang
5. Febe Fiona Soliun
6. Najib Ramsa
7. Troy Hessler Paul

Community Workshop (16 July 2020)

The community workshop was held from 9.30 a.m. to 3.30 p.m. on 16 July, 2020 at Kg. Sapadulang, consisting of the Upper Mid-Segama cluster: Kg. Upak, Kg. Lituk Pulau, Kg. Pendising and Kg. Tawaiyari and the Mid Mid-Segama cluster: Kg. Sapadulang, Kg. Batu 8 and Kg. Bukit Balacon.

We were joined by 20 participants that were representatives of their respective villages and made up of MPKKs, KKs and community members, except for Kg. Tawaiyari whose villagers and leaders were unable to make it. After a welcoming speech from the KK of Kg. Lituk Pulau and introduction of the participants and Forever Sabah team, we started with the first activity: *Jendela Kehidupan Saya* (Window to My Life).

In this session, the communities shared the condition of their village in the past, what they are seeing now, and how they hope the future will be. Below are the outputs obtained from the participants: -

No.	Past	Present	Hope for the Future
1.	There were a lot of trees	Trees have been cut down and river is polluted	Trees have been replanted and we have cleaner water
2.	● A lot of fishes and boats ● Lots of fishes for fishing ● Bathing in river with fishes	● Polluted with garbage ● Lots of mills	● Lots of trees have been planted by the river banks (<i>tangkol</i> tree as it has fruits that can be eaten by fishes) ● Increased fish stocks ● Able to camp by the riverbanks
3.	Able to do activities such as bathing in river, fishing, and drinking river water	-	Cleanliness of the river will be taken care of since

			it brings a lot of benefit to the village
4.	● Aquatic life, flora, fauna and environment in general was abundant ● Easy to fish	● Aquatic life: reduced ● Flora and fauna: forests have been cut, animals have fled and reduced in number due to lack of food source ● Environment: polluted by infrastructure progress and unsystematic solid waste disposal	● The nature will return back to its original state
5.	A lot of native riparian trees by the roadside, tobacco fields and clean river	The trees have all been cut down and the river is polluted	● Solid wastes are disposed properly ● Trees have been replanted ● Segama River is clean again
6.	● Kg. Batu 8 was a town managed by tobacco companies ● Water supply was direct from Segama River ● River is a safe place to carry out activities ● Town is complete – facilities such as schools and hospitals existed, and they were water supplier to Lahad Datu	● Everything changed as the river is now polluted – no more clean water ● River is unsafe due to presence of crocodiles	Segama River to be as clean as before
7.	● Clean water, no mills, no pollution, river is rich in fishes ● Safe to bath in the river	After mills are established, water is now polluted with oil, trees have been cut down and water is unsuitable to be used for daily use (bathing, drinking)	-
8.	● Had no electricity, water pipes, facilities to school, or gas source ● But rivers had lots of fishes	Reduced aquatic life due to poisoning of prawns and sand mining (water is murky)	Segama River to be as clean as before

9.	● Riverbank had forests and rich in flora and fauna ● Habitat good for healthy ecosystem	● Opening of palm oil estates had devastating impacts – erosion of riverbanks, surrounding wildlife affected, river is polluted ● Opening of mills has caused release of toxic gas, greenhouse effect and affecting the environment	-
10.	River is polluted and there are lots of flora	A lot of palm oil plantation	No more pollution
11.	(Other perspective – from Kota Marudu) Environment was green, good and lots of paddy field	● Paddy field has changed into buildings for shops and workshops ● River is shallow – no water during droughts and decreased water quality	If there is no effort to improve the current situation, the future is bleak – so hoping for cleaner water
12.	-	(Other perspective – from Forever Sabah) ● Observation of riverbanks – tall trees grow by the riverbank ● Trees like in forests are suitable to be planted – short, stable and has fruits that can fall into the river as food for aquatic life	More trees and plants planted for wildlife's food and habitat



Figure 1 Rosli explaining 'Window to My Life' to villagers



Figure 2 KK of Kg. Lituk Pulau, En. Kalong, sharing his experience

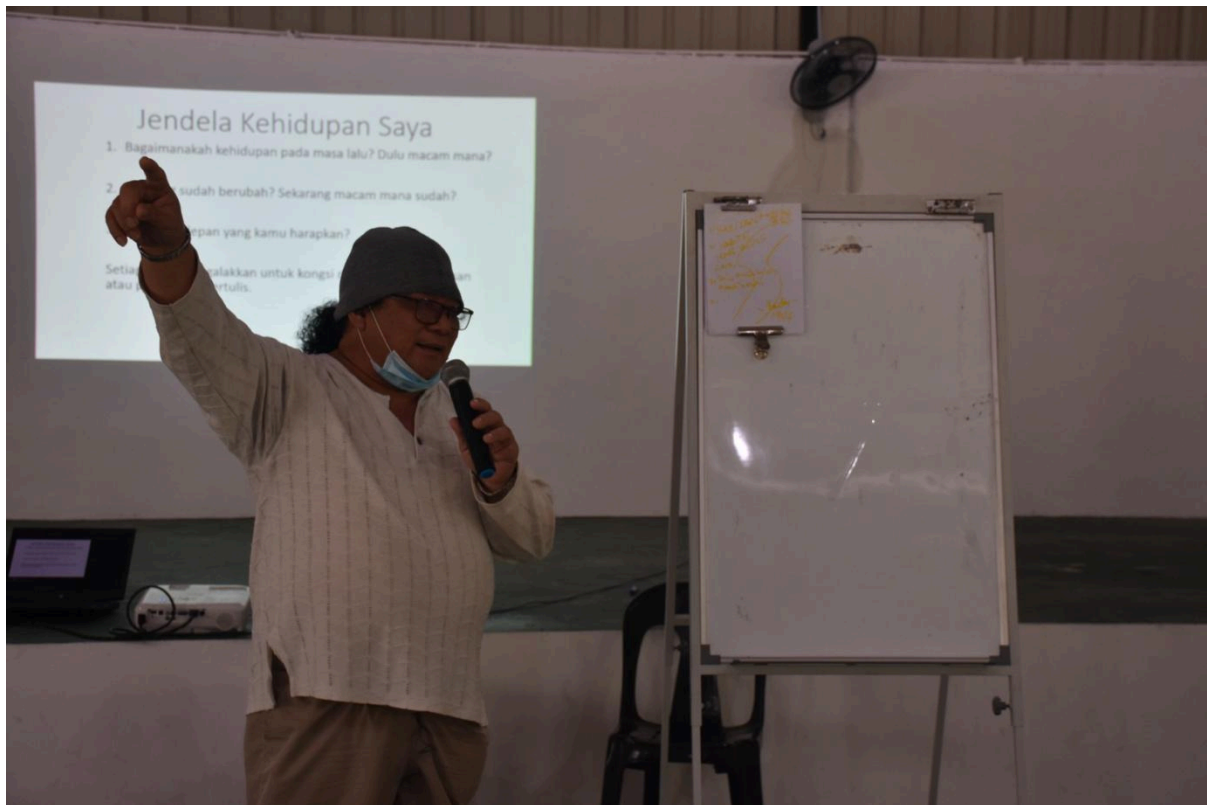


Figure 3 A participant from Kg. Batu 8 sharing a glimpse of his village's history



Figure 4 A youth and woman representative from Kg. Sapadulang

After lunch break, we moved on to the second activity: Timeline. This aims to see the turn of events that had occurred in their villages dating back to 60 years ago.

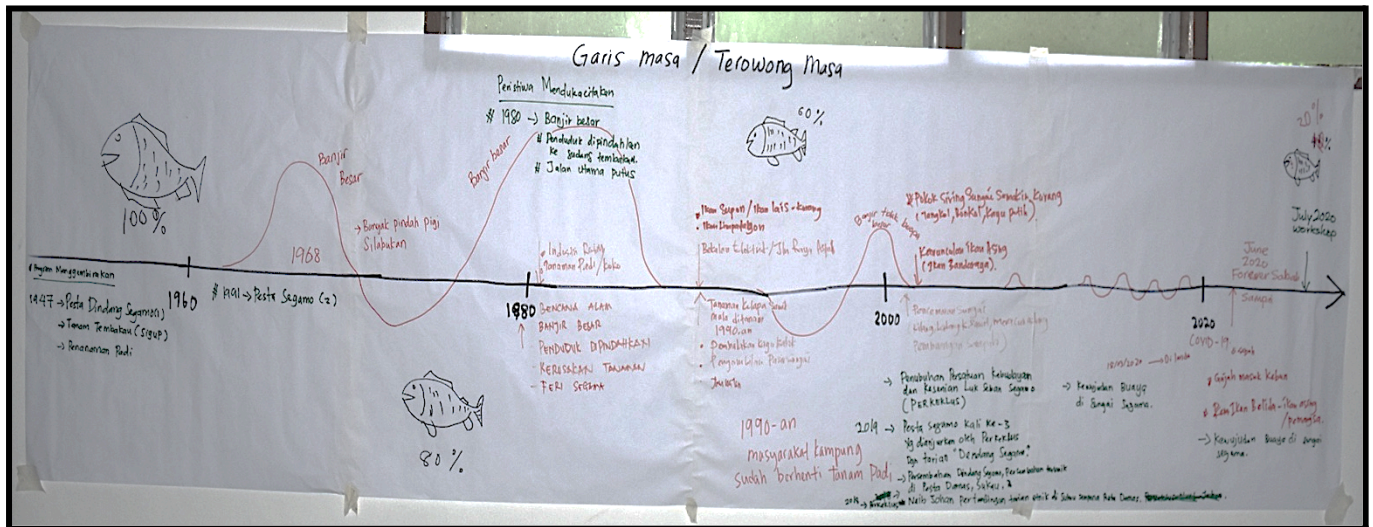


Figure 5 Timeline filled in by participants

The timeline showed the chronology of the following events: -

Years	Events
Prior to 1960	- Villagers celebrated the <i>Dindang Segama</i> festival - Their main socio-economic activities were tobacco and paddy plantation - Fish stocks were good
1960-1980	- In 1968, a major flood happened and many of the villagers moved to Silabukan (village in Lahad Datu) - Fish stocks have decreased - Second Segama festival was celebrated
1980-2000	- They entered 1980 with another major flood – villagers were moved in tobacco warehouses and their main road is cut off - The natural disaster also caused damage to plantations - Plantation for paddy and cocoa began - Segama ferry was established - Villages obtained access to electricity and asphalt roads were built - In 1990, palm oil plantation began and villagers stopped planting paddy - Logging as well as sand mining also began - Fish stocks further decreased
2000-2020	- In 2000, another flood happened but it was not major - Several smaller floods occurred throughout the year - Trees on riverbanks grew lesser and invasive species have entered the river (<i>ikan bandaraya</i>) - River polluted by palm oil estates, garbage disposal, and etc. <i>Persatuan Kebudayaan dan Kesenian Luk Seban Segama</i> (PERKEKLUS) was established

	• Third Segama festival was celebrated and organized by PERKEKLUS and presented the dance “<i>Dendang Segama</i>”, which was the best performance at Damas Festival, Sukau • In 2018, PERKEKLUS was the first runner up for ethnic dance in Sukau for the Damas Festival • Presence of crocodiles in Segama River
2020 onwards	• Country was overcome by COVID-19 • Fish stocks have decreased greatly • Another invasive species identified – <i>ikan belida</i> • Elephants entered plantation areas • In June 2020, Forever Sabah arrived • July 2020, water quality and riparian biodiversity workshop has been held



Figure 6, 7 and 8 Villagers coming together to fill in the timeline



We then moved to the workshop presentations prepared: -

- 1) Diversity of Riparian Biodiversity by Rosli Jukrana;
- 2) Fish Biodiversity in Rivers by Casey Ng; and
- 3) River Water Quality by Casey Ng

Even though the presentations were disrupted by heavy rain, making it difficult to hear anything, our speakers adapted and were able to present successfully. Thus, from these presentations, we had a dialogue session with the participants to discuss on their questions and opinions: -

No.	Questions	Answers/Discussion
1.	-	The KK of Kg. Lituk Pulau agreed that Segama River can have its focus on rehabilitation of riparian zones to decrease the pollution.
2.	If there are any persons interested in opening ponds, is there any aid that is provided under Forever Sabah or the Fisheries Department? Is it okay to use canvas as the base of the pond?	Fisheries Department do provide license to operate such pond, but we must be able to provide the guarantee that the fishes being bred (bred) will not be released in our rivers. Yes, we can use canvas as it will help in reducing water usage.
3.	What can we do to prevent invasive species from being in our rivers?	If we catch any invasive species, do not throw it back into the river. Any invasive species caught should not be thrown back into the river. They should be discarded inland or made into fertilizer. In relation to this, we also aim to identify what are the species in Segama River that are local species and alien species. Once this is successful, we can use pictures of alien species to create a poster and spread it to the public to raise awareness about alien species.
4.	Has there been any research on how to control or stop the reproduction of invasive species?	For now, there is none in Segama River and Sabah.
5.	Are there any chances of freshwater fishes and saltwater fishes crossbreeding to produce a new species?	● There is no chance, due to the differences in its physical form. For example, saltwater species has bigger gills for more oxygen intake, and freshwater species has small gills. They also excrete different mucus that can protect them from different bacteria that exist in freshwater and saltwater. ● However, there are some species that can survive in both freshwater and saltwater

		(<i>siakap</i> , <i>udang galah</i> , eels). Thus, if there are aforementioned species are not found in an area, it is an indicator that the river and sea connection has been cut-off, or polluted, and so the species are unable to go to the sea to reproduce.
6.	Regarding to species of fishes, <i>tilapia</i> exists in different colors, thus do they consist of different species? Also, eels live in freshwater and reproduce in saltwater – how can it be in both places?	• The red <i>tilapia</i> is actually a hybrid from Taiwan, and both the red and black <i>tilapia</i> come from the same species. • For eels, in Sabah we have two species – one lives in paddy fields and another is <i>sinsilog</i> (slightly bigger). <i>Sinsilog</i> is able to live in both freshwater and saltwater because it has gills to adapt to the differences. For now, <i>sinsilog</i> still can be found in Sabah, and when fishing, it can still be caught. However, it is difficult to determine the actual amount of it left.
7.	How can we determine which fish are safer or healthier to consume?	There is no sure way to determine. However, fishes that can survive anywhere, even in polluted environment, is less likely safe for consumption. Thus, if we are to recommend a “safer” fish for consumption, consume those that can only thrive in a healthy environment.
8.	Villagers are used to hunting. Is this still possible to hunt the wildlife around riparian zones?	Traditional hunting is possible, but it is highly dependent on the type and endangered status of animal being hunted as well. In this case, license is required as per the Wildlife Conservation Enactment 1997.
9.	The erosion of riverbanks has caused to change the shape of the river throughout the year. How do we manage this?	• River and riparian change shape naturally in response to variances of rainfall, or unnaturally when there is human induced land-use change). Some effects are good, for example more soil can be accumulated in the riparian zone thus enabling formation of new forest. • On the other hand, riparian soil erosion may also happen and causing forest loss. Soil can be added, removed and transferred along the river when the watershed landscape is natural or impaired. • However, if the landscape is natural and vegetated, the soil movement processes are less frequent.



Figure 9 Rosli sharing his experience on riparian rehabilitation



Figure 10 Casey presenting

We then moved on to the final activity of our workshop, which is a discussion with the community on how to best move forward with enhancing water quality, rehabilitating riparian and fisheries. Their outputs are as below: -

Water Quality	Riaprian	Fisheries	Cross-cutting Efforts
1. Establish river rangers 2. Provide training to communities 3. Organize an awareness field trips for exposure	1. Planting of trees along the riverbank – commercial or fruiting trees 2. Ensure estates upstream take care of riparian as villages are still dependent on rivers, especially Kg. Upak, Kg. Tawaiyari, Kg. Pendising and Kg. Lituk Pulau	1. Workshop on fisheries to learn about ethical fishing, identifying species, and etc.) would be useful	1. Involving plantation companies in our efforts 2. Organize environment campaign (how to care for flora and fauna) in schools and villages

We then concluded our workshop at 3.50 p.m. and shared tea break with the community. Once done, a few of the Forever Sabah team members headed to take water sampling from the river, guided by Kg. Bukit Balacon participants, En. Tony Quirinus (MPKK) and En. Stefanus Banus.



Figure 11 En. Tony at one of the water sampling sites in Kg. Sapadulang



Figure 12 Water samples successfully collected from Lower Taliwas River, a tributary of Segama River (Left to right: Najib (Forever Sabah), En. Tony, Casey (Forever Sabah), Troy (Forever Sabah) and En. Stefanus)



Figure 13 Forever Sabah team and participants

Water Sampling (17 July 2020)

At 9.00 a.m., five of us from the Forever Sabah team headed to Danum Valley, Lahad Datu together with 7 community members for water sampling at Site A and Site B. The community members consisted of MPKKs, KKs and community members from Kg. Pendising, Kg. Bukit Balacon and Kg. Sapadulang.

We spent about 4 hours inside Danum Valley searching for the best sites that are also accessible for collecting water samples. This was a challenge as some water margin areas were steep and dangerous due to the torrent waters. Locals also feared crocodiles may be present in Upper Segama River. The initially chosen Point A and B had to be abandoned as the sites could not be accessed; some paths were barricaded or closed. These were subsequently moved to another suitable localities with better accessibility.

Casey provided brief explanation on the water sampling and also a demo to the participants at both sites A and B. Segama River at Danum Valley (Site A) has well preserved riparian, however the water was murky, which is believed to be due to heavy rainfall the night before.

After sampling completion at 2.00 p.m. and spending some time for lunch with the community members, the Forever Sabah team headed over to Kg. Tawaiyari to take water samples from Site C while community members headed back their to respective homes.

After Kg. Tawaiyari, we have completed our first round of water sampling from all sites – water sampling from Lower Segama sites have been previously completed by our facilitator, Najib Ramsa.

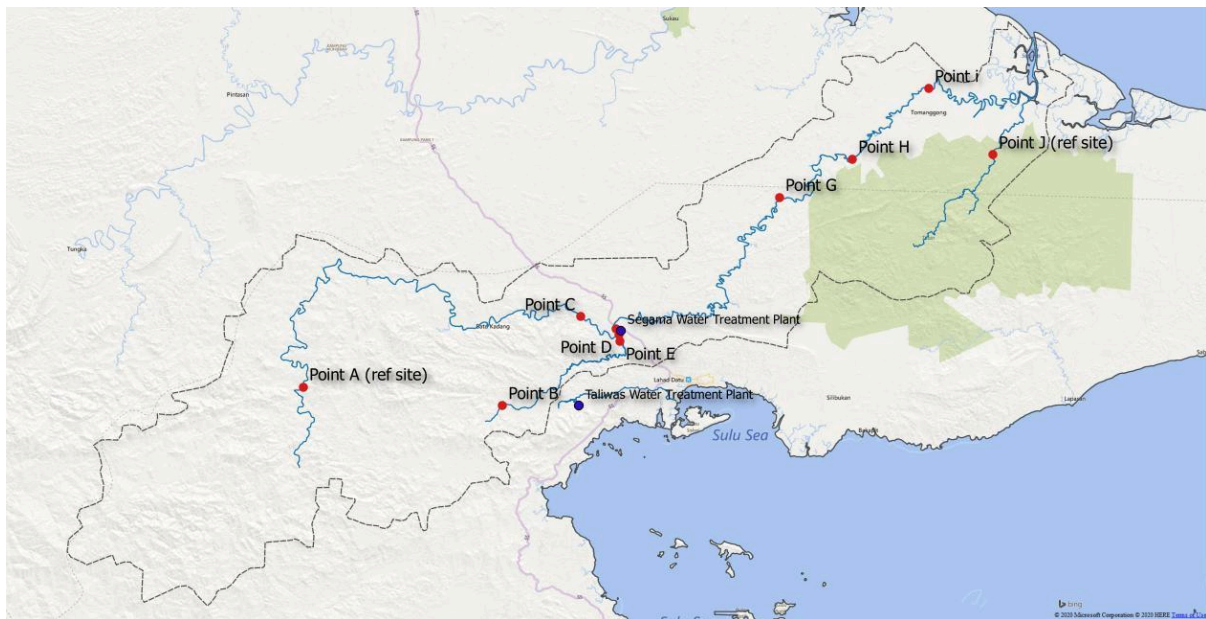


Figure 14 Locations of sampling points in July 2020.

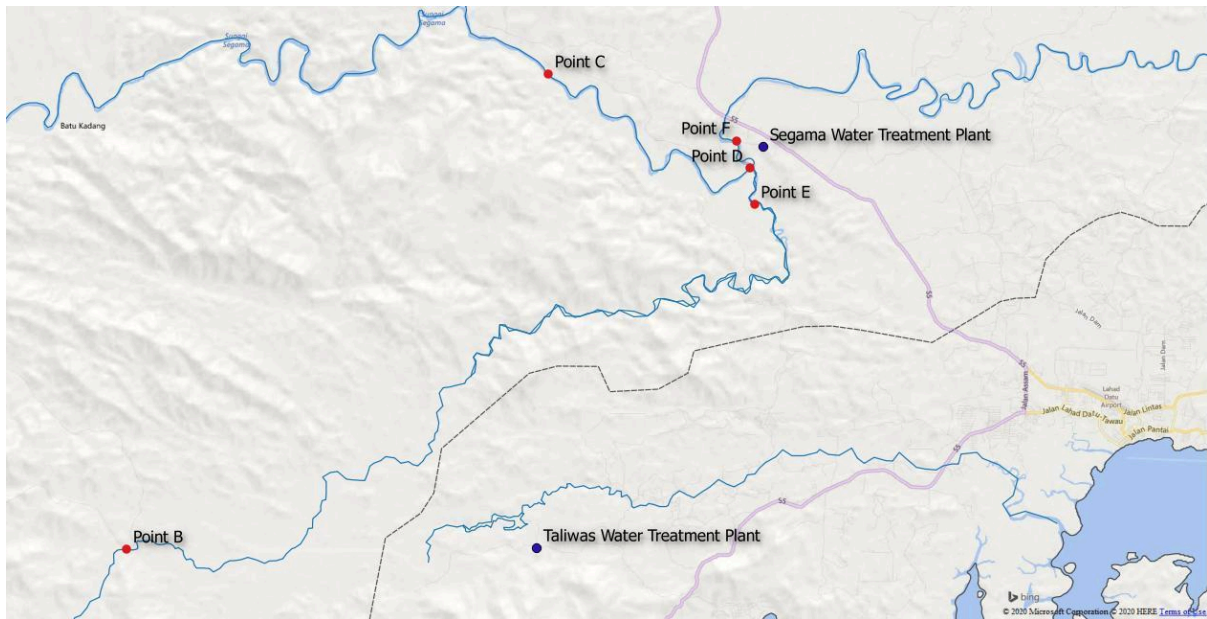


Figure 15 Sampling points within Segama River watershed boundary affecting intake of Segama Water Treatment Plant. Note that there is another water treatment plant nearby (Taliwas Water Treatment Plant) but its watershed is not within Segama River watershed boundary.



Figure 16 At the time of field survey, the water was murky in upper Segama River, Danum Valley, although riparian area was natural and intact.



Figure 17 Casey briefing the communities on water sampling





Figure 18 and 19 Collected water samples by Najib from Point A



Figure 18 Water sampling by Casey at Point B (upper Taliwas River)



Figure 19 Cleared riparian for plantation at Kg. Tawaiyari



Figure 20 Water sampling at Point C by Casey and Najib



Figure 21 Water sampling at one of the sites in Lower Segama River by Najib

Visitation to Hap Seng (18 July 2020)

Forever Sabah's team visited Hap Seng's laboratory to familiarizing themselves with the company's test apparatus and capacity. Forever Sabah's team gave a brief about the project to Hap Seng's team. Certified chemists and lab assistants introduced themselves and also gave Forever Sabah's team a tour in the lab. The laboratory was well equipped with the necessary tools and equipment to carry out water quality testing and the procedures are certified by *Skim Akreditasi Makmal Malaysia* (Certification no. SAMM 892).

Since the laboratory was roughly 2 hours drive from Lahad Datu on unpaved road, how water samples can be sent to Hap Seng in subsequent months may be a concern and this was discussed. To simplify logistics, Hap Seng suggested that the water samples can be sent to their office in Lahad Datu and their daily dispatch team will transport the samples to the lab.



Figure 22 Plantation Central Laboratory Unit in PCO, Hap Seng



Figure 23 Casey making introductions on Forever Sabah and our work at Segama River with Hap Seng staff



Figure 24 On 20 July 2020, the collected samples were successfully delivered to testing lab of ALS Technichem (M) Sdn Bhd, Kota Kinabalu

In Summary

From this workshop, the main takeaway is that the villagers want their rivers to be clean again and are willing to focus on long-term solutions such as rehabilitating damaged riparian, raising awareness and educating the community and work with private sectors to resolve existing issues. Water sampling exercises need to continue in August and September to ensure the adequate baselines are collected and available to inform the Action Plan.

We have now moved on to ensuring that these objectives will be met as the project progresses – we have initiated a platform for discussion amongst the relevant parties and proposed an Action Plan that has been introduced and working towards finalization.