

Screening and Cleaning the Ocean around Kampoenng in Indonesia



Picture caption: The coast of Tolitoli, where schoki was realised.

Working with waste and nature A foundation for ecotourism

----- WHAT IS SCHOKI?

Screening and cleaning the ocean around Kampoenng in Indonesia, an environmental project that on one hand evaluates different impact of the human doing to its ocean and on the other hand organises different ways to clean it. It is implemented in a kampoeng (village) in north Indonesia called Tolitoli.

The organization behind this project is called BUGI (Bildung und Gesundheit für Indonesien), an NGO with over 40 members (that is) based in Germany. It mainly focuses (itself) on development programs on issues of education as well as health in societies and their environment.

It took the team of seven volunteers almost a year to plan the project. The preparation consists mainly of procurements, communications with our partners as well as budget planning, whereby the income is mainly sponsored by GIZ and donations. SCHOKI worked mainly with three important partners that were preferred as stake holders which are all based in Indonesia. Two of them are even set in Tolitoli. The first stake holder is the University of UKDW from Yogyakarta.

Through this cooperation various of research was done by ten students, mainly in the areas of environmental health audit and ecotourism.

The manpower and equipment to assist these students for the research done under water was being provided by the second stake holder, Boki Dive, which is owned by Ariyanti Bantilan. Apart of scuba diving, this dive center also focuses its activities on corral table planting and the conservation of dougungs (sea cows).

The third partner SCHOKI worked with is the Waste Bank of Tolitoli itself. Through this cooperation, the project could succeed in beach cleaning and mangrove planting activities. In addition to this, the project could implement an optimization of the recycling process done by the Waste Bank Company.

Lastly it was important for SCHOKI to inform the local public about important themes regarding the collaboration with their environment. This was approached by workshops about waste management and eco-tourism that were conducted in local governments, communities, and schools.

Tolitoli

Jan Suhartono

On the north coast of central Sulawesi, where the island makes a curve to the east, there is a small town that looks onto the sunset. It's either a half a day drive or an hour flight away from Palu.

Tolitoli is a town in a bay surrounded by islands and small mountains. A town where the people depend most on its nature resources like sea food and cenkeh, which are shipped to Jawa via container ships that harbor here.

Due to the high shipping activities and damaging fishing methods like fish bombing, the underwater habitat suffers enormously. Many fishing nets and anchors have left their marks on its reefs. Still, most damage is caused by corral bleaching that is the consequence of the rising ocean temperature.

The nature of Tolitoli is also being agonised by its most common enemy: the plastic waste. Beaches and rivers are extremely covered by this slow decomposable material.

On the bright side, a small group of people exists who care about its environment and their attitude is starting to impact the society of Tolitoli. Moreover, their actions are being recognized by its national government that have seemed to realise the importance of a way of living which respects its nature and environment.



Picture caption: The city of Tolitoli. A home for around 54.000 people.



Picture caption: Waste storage at BSTM. The left part are plastics that have been fished out of beaches and the sea while the waste in the bags comes from societies.

When waste is a money source The environment profits as well

It's not a secret that Indonesia has waste issues. You can find plastic everywhere. In streets, fields, swamps, beaches, stuck between corals, in rivers, everywhere. The thing is, once you take the initiative to collect them, most likely there will be new garbage there the next day.

This is not only due to lots of peoples "don't care" attitude regarding the waste that has been like this for generations, but Indonesia is also one of the largest plastic importers in the world. The waste management of Indonesia has a lot of potential improvement. Though landfills exist, getting the rubbish there is a different issue.

BSTM depends on the recyclable plastic waste they receive to produce plastic chips they then sell. They receive waste via two ways. First from the society of Tolitoli itself. People are encouraged to hand in their household rubbish by offering them to buy it from them. For 1kg of plastic the owner can receive 10 cents of cash. By this method the society is being encouraged to see waste also as a source of income.

The second way is by collecting rubbish is from nature, by cleaning actions. This way works as a win-win situation for BSTM and the environment, that is being freed from plastic.

BTSM

Waste processing company

Bank Sampah Tolitoli Mandiri or the independent Waste-bank of Tolitoli, focuses itself in collecting, sorting, cleaning, and shredding recyclable plastic, that is being processed into plastic chips. These products then are being sold to companies that use these chips for their plastic productions.

The idea of BSTM started as a waste collecting action on the islands surrounding Tolitoli, with the aim of cleaning them. Realising the huge amount of plastic they collected, Wiyat Moko decided to store them on a piece of land he bought. Two years later BSTM is the employer of over 15 workers and owns two waste processing machines that simultaneously cleans and shreds plastic.



Picture caption: Plastic recycling at BSTM: A worker fishes out the plastic parts that can't be processed.

Recycling the non-recyclable Breaking down plastic back into fossil fuel



----- THE PIROLYSIS MACHINE

Soft plastic like plastic bags consists of different types of polymers and is thereby almost non-recyclable. Not by the commercial recycling methods anyway. There is a way though, to break down the polymers into its basic components, into oil. What most of us don't know plastic bags are mostly made of petroleum (fossil fuel).

This fossil fuel can be extracted by using pyrolysis, a locked heating process which is similar to distillation. This kind of machine was being provided by SCHOKI.

First, in a closed container, the plastic is brought to boil. The produced steam then is cooled down in a tube surrounded by moving water and changes its form from steam to liquid. The pyrolysis machine produces around 70% biodiesel, 10% kerosene and 20% methane. This fuel can be used in old combusting engines like small boat engines or the waste processing machine, that is being used in BSTM to recycle hard plastic. Through this, the fuel for recycling is also recycled.

The decision of choosing this type of pyrolysis machine took the SCHOKI team around six months of research and communication. In this period different aspects were considered like effectiveness, process duration, plant size, price, and fuel quality. This machine was being chosen, since it was based on the Hamburger process that was introduced 1985 in Germany. A catalyst accelerates the process time, while the machine is built from a very stable system and material. Even though the price was not cheap it convinced the team to fix on this option, due to the importance of safety in heat processes.



Picture caption: The assembled SCHOKI dive team attaching broken corals on to a coral-planting-table.

Diving for a good cause

A coral planting research team

The second part of the project took place underwater. A diving team was put together, which consisted of two students from the university of UKDW, three professional divers and an operative of the SCHOKI Team. Its mission was to accomplish two research theses and to support coral restoration at some reef spots.

As it was mentioned earlier, a lot of coral reefs are in bad conditions. This shouldn't be ignored too much, since coral reefs act as underwater forests, that are not only the source of food and protection for billions of fish; like trees, corals also have the ability to absorb CO₂. To understand the situation, the importance of the coral triangle of east Asia to the ocean can be compared to the importance of the amazon rain forest to the land life.

The reefs of Tolitoli are a part of this coral triangle. Therefore, it was important for the project team to also be active in this area.

The first research was accomplished to understand the actual condition of the corals in this area. For this, eight different reef spots around the island closest to the bay of Tolitoli were inspected. Each spot had a depth between six to eight meters and a length of 50 meters. At each point the team conducted a parameter recording, testing the waters salinity, PH value, dissolved oxygen, etc. Each meter was photographed to be analysed by a specific software. Through this, we would know not only the density and cover of the corals, but also its damage scale, and the cause of its damage. If they are broken through human activities, bleached or sick through for example turf algae.

Simultaneously this diving team was actively involved in coral planting. Like in every gardening we do in our garden, coral gardening is also depending on sunlight, nutrients, and the temperature of its surrounding. The small difference is, in our garden we don't have any currents or waves that could rip out our plants. Therefore, the most common way of coral planting is by attaching finger sized fragments of corals to a table-like structure that is being fixed onto the sea ground. Corals are slow growers. In good conditions corals grow around 1-10 cm in a year. That is why the maintenance of these coral tables are equally important as the first part.

The search of a save home

A thesis that supports the conservation of sea cows



----- ANALYZING SEA FOOD

The second research was conducted to support the conservation of sea cows (Doungong). These mammals are very gentle and shy creatures that are threatened with extinction. There are just a few spots in Indonesia where these animals feel at home, one of those places is on the coast of Tolitoli.

The idea of the research is to gather enough information and proof about a specific area, that is supposed to be a suitable conservation zone for sea cows. In this zone, human activities are reduced to a minimum. Ships and boats are only allowed to pass if it is absolutely necessary. Entering this zone by other accesses is only allowed with the supervision of a forest ranger. Besides, hunting the sea cows in this kind of areas would bring severe consequences for the hunters.

By this measure, the sea cows could have a habitat where they are not disturbed or even threatened. A place to recover or yet to breed.

This research, as an environment quality evaluation, is also done by the assembled dive team. The procedure is similar to the first research, only that this time the sea grass was being inspected, the food source of these sea cows. It is important to recognise the kind and density of the sea grass in this zone. The result of this research will then be presented to the local authorities that will hopefully decide to build a conservation area for these beautiful animals. Still, the research result of one zone is not enough to make this kind of decision. Other natural areas that are suspected to be good conservation areas, must be inspected as well.

Giving the knowledge to the people

Are we saying enough?

It's important to share knowledge, particularly if the knowledge could help the live quality of people and its surrounding. Through this philosophy, it was a priority for the project team to inform the public about what the team have figure out from the work done by the students of UKDW and experience of the partners who were helping us in Tolitoli. As a result, there were 2 themes that could be explained through educational workshops: organic waste management and the importance of eco-tourism in a place like Tolitoli.

For the first workshop, the project worked together with Eco Enzyme Nusantara (EEN), who already had experience in reprocessing organic waste, especially wastes from fruit and vegetables. Through the process of fermentation, it is possible to create an enzyme that acts as a decomposer. This liquid can than be used as a natural cleaning substance, that has similar working method to soap. The workshops were healed in local government and communities.

The other workshops, about the importance of eco-tourism in a touristic place, were healed and viewed by 2 schools. Here it was explained how tourism often brings new investors and therefore money and opportunities to a place. But on the other hand, intense tourism activities, can also easily damage and even destroy natural



Picture captian: BUGI representtative (*second from right*) with an EEN representative (*first from right*) explaining the production of ecoenzyme.

habitats. More tourists mean more rubbish. In addition, it is not uncommon for immigrants to cause cultural conflicts. That is why a system of ecotourism is so important. Ecotourism is a form of tourism that is also responsible for the conservation of nature, provides economic benefits and preserves the cultural integrity of the local community.

How the project went down

.. and what is the next step

----- THE SUMMARY

It would be a utopian idea, to build up a project without any difficulties. It's even less likely in a time of the corona pandemic where due to safety reasons, a high restriction for foreigners was set to enter Indonesia. Furthermore, until the end of February, there was an obligation of ten days quarantine for everyone entering the country. This situation caused a delay in the implementation of the project by nearly three months. Due to this and due to the imperfect communication between the team and the partners, the project faced some obstacles, that were important to be solved.

Nevertheless, the implementation phase was an overall success. Most pre-planned measures could be accomplished. This includes beach cleaning and mangrove planting activities with some communities, a variety of workshops, the assembly and testing of the pyrolysis machine, diving for a good cause, as well as supporting some students with their thesis and studies.

A great gratitude goes all the people who had supported the project by preparing and/or donating at the SCHOKI benefits party in the K9 House in Stuttgart. An even bigger appreciation goes to GIZ. Still, all of this couldn't have been done without the team behind this project, that had sacrificed their free time and energy to plan and execute SCHOKI. Last but not least, to all the partners and students that have actively implemented the project; *karena kalian program SCHOKI bisa terlaksanakan dan sukses di Tolitoli.*

Even if all that was planned was achieved, it does not mean that the project ends here. There are just way too many damaged coral reefs to stop planting corals. Also, to make a coast area an official conservation zone for dougongs, one quality evaluation is not enough. The collaboration with nature or environmental protection organisations would be the next step for BUGI, the association behind the project, to reach this goal. Additionally, on the islands around Tolitoli there are still a lot of people who can neither read nor write. With the support of those who believe in the develop programs of BUGI, who knows, maybe SCHOKI Part 2 could focus a part of the next project on education by providing a learning boat, with books and teachers.

“Environmental protection is not just a wishful thinking. It is also an action.”