

Luminocean – marine education and volunteering programmes at the Banda Islands

Where our inspiration comes from

Coral reefs are the ecosystems with the world's highest efficiency in producing oxygen and binding carbon. This makes coral reefs extremely important for our climate and well-being. Unfortunately, coral reefs are now facing the greatest challenges they ever faced: sea temperatures are rising, causing corals to bleach, and human populations in coastal areas are increasing, contributing to overfishing and destruction of nearshore reefs. Indonesia lies within the hotspot of coral diversity and the Moluccas are one of the regions with the still healthiest coral reefs and fish stocks. However, the Moluccas are also under rapid economic development. Economic development can have negative impacts on natural resources such as coral reefs if it comes along with a lot of coastal construction without thorough environmental considerations well ahead. With Luminocean, an Indonesian social enterprise, we believe that development can be positive for both, economics and environment if important key points are considered. Our mission is the education of local people to facilitate their involvement in developmental decisions. We approach our mission by focusing on the education of three different age groups at the Banda Islands:

- A) In our environmental education center on Hatta Island, primary school children are taught basic principles of environmental friendly behaviour. This includes distinguishing between organic and non-organic wastes and how to handle those, learning about corals and fish while swimming with the masks facilitated by the center, obtaining a feeling of responsibility for oneself, for the community and the environment.
- B) With the computer lab "Lab kali-kali" we train kids in the age of 9 – 18 in using the most important computer programmes including simple programming games and in solving mathematical problems. This shall develop the skills of critical- and problem-solving-oriented thinking.
- C) The core activity of Luminocean addresses college students from the Fisheries school Banda Naira. We give selected students the opportunity to conduct their Bachelor thesis using marine field work. For this, we train them diving and all additional skills needed to conduct coral reef surveys or other techniques needed for conservation-oriented marine research. The students also work closely together with volunteers from all over the world who join our conservation programme to learn about coral reefs. This interaction makes both, local students and volunteers benefit from each other. The local students' field work is supported by the volunteers' financial contributions and the volunteers get the opportunity to submerge much deeper into local culture by making friends with the students. The research is supervised by senior Indonesian researchers and their partners, Marine scientists from German and Australian Institutions, who act as advisors for Luminocean. Bandanese students who are fascinated by the environment and who obtain the opportunity to get involved in marine research and take their first step into an academic or scientific career can be the brains of the future. They will have the power to get involved in decision making and local politics to conserve the environment of their home islands.

How it works

On our website www.luminocean.com volunteers, gap-years, divers and students find an overview of marine biology courses that we offer. Those who sign up will come to Banda and stay in our training facility and locally run guesthouse Nurasia www.nurasiabanda.wixsite.com/nurasia . Most participants spend 2-5 weeks with us during which they improve a lot in their dive skills, learn about coral reefs and fish and assist local students to conduct field work for their research. With their financial contribution (€350 per week including accommodation, diving, scientific programmes and most meals), they also support the funds needed by the local students to conduct their research projects. The local students are recruited based on recommendations by their teachers and if they demonstrate a high motivation to develop their skills.

Current projects

At the moment, we are supporting three research projects.

- 1) The Bachelor student Andika is investigating timing and synchronization of coral spawning at the Lava flow, a highly unique reef that developed on a lava flow after the last volcanic eruption of Gunung Api Banda. Andika was able to trap coral eggs with self-made traps and could isolate egg-DNA and determine the coral species. He or future students will further have a look at the significance of the Lava flow reef in providing other reefs with new coral recruits. This is a project with a high potential to be applied to effective reef management. Volunteers who help Andika assist in constructing and deploying egg traps and conduct a lot of night dives during the nights with the highest potential for coral spawning.
- 2) The Luminocean field coordinator on Banda and Marine Science alumni Herdian looks at a sea squirt that started to spread in some reefs at the Banda islands. Aim is to find out if and how strong a negative impact of the sea squirt could be on natural coral reefs. For this, surveys are conducted in which the abundance of the sea squirt is determined and brought in relation to the degree of impact on the reef. One hypothesis is that coral colonies that suffered from bleaching might be more susceptible to be overgrown and eventually killed by opportunistic organisms such as this sea squirt. Volunteers get the chance to participate in survey dives around all Banda Islands and learn how to use an image analysis programme for data evaluation.
- 3) The Banda islands are home to two species of the fascinating flashlight fishes. These fish use bioluminescent bacteria in specific organs below their eyes to find prey at night and possibly to communicate. Herdian and the head of the fisheries school on Banda, Budiono Senen, want to find out more about these fishes' distribution and the functions of their light organs. The project is currently open for local students to conduct their Bachelor theses. Volunteers and students get to dive during dark nights without lights or using only red lights. Once their eyes adjusted to the darkness, they get hooked by the amount of bioluminescence that surrounds them and illuminates the reef and by the schooling of light organs in their vicinity.

Our vision

We hope that the training provided by Luminocean will help the communities on the Banda Islands in future to take decisions that will go hand in hand with the conservation of the marine environment.

Our dream is to set an example for other islands in the Moluccas or in the coral triangle by demonstrating that education, research and soft tourism can be combined into one resilient tool for sustainable development.

The organisations involved

Luminocean is a brand name for the Indonesian social enterprise PT Marina Citra Selaras and the Yayasan (foundation) Sea Ventures Trust. PT Marina Citra Selaras was founded in December 2014 by the mechanical engineer Elsa Santika and the marine scientist Yuliana Syamsuni. Yayasan Sea Ventures Trust was founded half a year later by Elsa Santika and the marine biologist Dr. Mareike Huhn. The German registered foundation Bandasea e.V. www.bandasea.org additionally supports the environmental education center on Hatta Island and a waste management project on the Banda Islands. It, therefore, is an important partner of Luminocean. All diving-related activities are supported by the dive center Bluemotion www.dive-bluemotion.com on Banda Naira.