

Ecological and Socio-economic development projects for the use of carbon compensation in Kpalimé, Togo

In cooperation with *Natureoffice GmbH* and *Ecocent Togo*



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Introduction

The human-made climate change is nowadays undisputable and it is inevitable that carbon dioxide emissions and also carbon-equivalents, speaking of other climate-damaging greenhouse gases, must be reduced to a minimum to reach the goal of keeping the global average temperature well below 2°C or even better at 1.5°C comparing to pre-industrial level. If that undertaking is not successful, the world's society and environment will face menacing threats, such as droughts, wildfires, floods and returning heavy precipitation to name just a few of them. The global ecosystem will challenge a continuous transition and adaption to a changing temperature and changing habitats, which will be hard to manage for flora and fauna. Those circumstances will bring change in human society, especially for vulnerable groups, like people living just at the lowest poverty level or people in higher ages. These threats not just touch the human itself but also his economic basis in many places, especially when those are heavy in agriculture. To prevent these threatening scenarios, politics have created different measures to stem climate change (IPCC 2018). One of those measures is carbon offsetting, a concept which will set the base of this project in practice report and which is the foundation of the business model of *Natureoffice GmbH*, the company where the internship was conducted. In the following parts the concept of the enterprise will be explained, the main part of the report will however be the summary and analysis of the internship and my personal experience. The end of the report will be composed of a critical review of the mechanism as well as a conclusion of the internship. The report will be written from a personal view, sometimes a plural form is mentioned, with that my internship colleague, who did the same internship as me, is meant in addition to me.

Company Description

The internship was taken in partnership with *Natureoffice GmbH*, a German company which business focus lies on the support of companies during their way to corporate sustainability. For that, the clients are getting supported in analysing their CO₂-emissions, accounting them as a Corporate Carbon Footprint and creating roadmaps for the final realization of becoming carbon-neutral. Furthermore, *Natureoffice GmbH* functions as an actual project developer for offsetting projects, in which potential clients are able to compensate their carbon emissions. Based in Wiesbaden, Germany the managing and carbon trading part is taken care of in Germany. Due to the fact, that I was only working and fully included in the operational work in Togo, the report will cover only that part of the business sectors *Natureoffice GmbH* is having (Natureoffice 2024).

In Togo, the executing company is not only *Natureoffice GmbH* themselves, but also *Ecocent Togo*, a partner NGO, which is taking over all the project implementation, the forestry and the conduction of the socio-economic projects, like animal cultures as income source or agriculture workshops

and alphabetization courses. The NGO is officially based in Togo and also founded in Togo. The project management is being controlled in cooperation with a German project coordinator, who was also the overall respondent and responsible for me. He is normally based in Germany and in regular time periods he travels personally to Togo, to support, manage and check the projects. The projects being conducted are based on the goal of environmental security, but also socio-economic development for the village inhabitants. This happens for example by the installation of sustainable ovens, which are more efficient, thus more economically for them but also healthier for them due to less pollution in the house. Another aspect is the inclusion of the inhabitants in the actual work to create an additional income source for them. The variety of projects is large, there are fountains which are being built for clean water, toilets for hygienic sanitation, sheep and rabbit farms as income and food source, water filters, reforestation projects, new school buildings, conduction of education workshops for the population or construction of fish

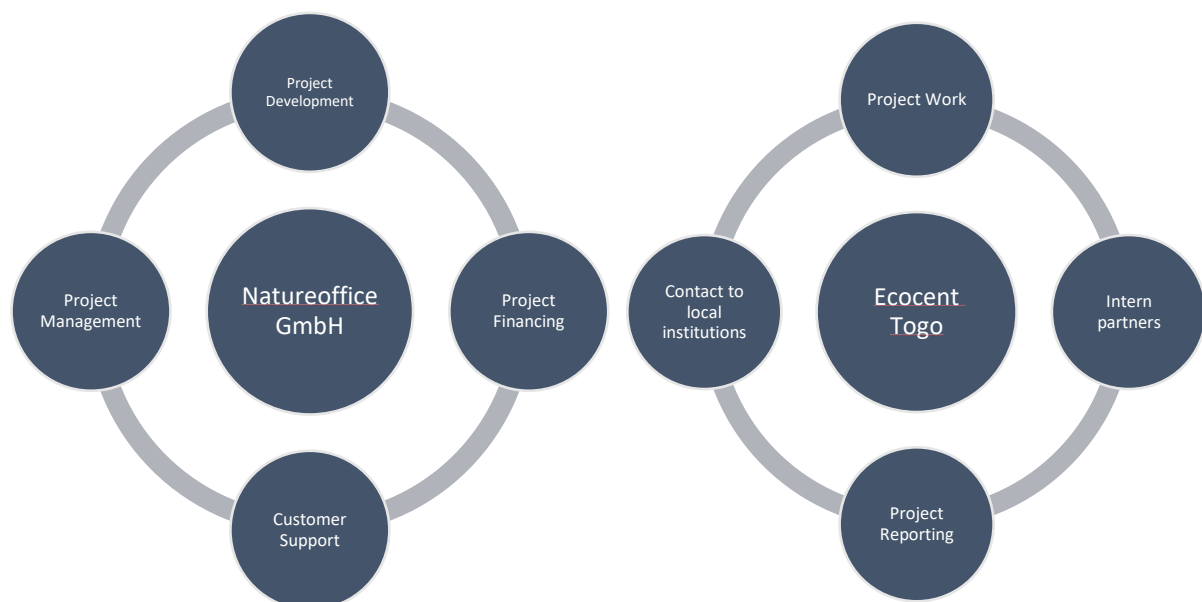


Figure 1: Illustration of the company structure of Natureoffice GmbH and its NGO-partner Ecocent Togo, including each responsibilities

farms. Due to that variety, the company is very interesting and offers a broad spectre where customers have possibilities for monetary inputs. All in all, the cooperation between the NGO and the company works very well, at least from what we can judge.

Objective

The main objective of our stay in Togo was supposed to be the creation of a digital map, which should firstly serve as an additional working tool for the company employees. The map should content all the different project locations, as well as short descriptions of the work done there. Furthermore, the map should help in the future project planning process, to find out different

project potentials in different locations. By a well digitalized and visualized map, the company should be able to better determine these in the future and use the map as a key tool for that.

The secondary objective, which crystallised out during the first weeks of the internship was the preparation of a visually attractive and interactive map, which should be uploaded on the company's website. The purpose of this, is the explanation and presentation of the company's work and their specific projects, especially for clients and potential future clients. This certain map should be interactive, easily accessible for any person, which will visit the website in the future with elements in it to show the projects, project descriptions, photos and videos.

More generally, our work in the country should also support the coworkers from *Ecocent Togo*, not only by the creation of maps but also with support in the maintenance of the project areas, such as the reforestation, enlarging client forests or doing tree inventories. The company was very engaged to transfer knowledge about the practical work in the project implementation of carbon offsetting in the voluntary market. My internship colleague and me were also directly encouraged to bring in ideas and general input to potentially improve projects and to let them benefit from the external lenses we have as non-permanent workers.

Work and Project Procedure

Planning

Several digital meetings were held in advance, which led step by step to the final project topic. The initial contact took place in September 2023, very early on, so the internship itself didn't start until June 2024. In retrospect, it was very helpful to have so much time in advance, as it allowed us to talk about different project topics, weigh them up and ultimately decide on a GIS-heavy project in which we also had other influences. These should not only cover the company's ecological goals and contribute to these benefits, but it was also important to me and my project partner to include socio-economic factors. The idea was initially to create a digital map that could be used to analyse project potential using spatial illustrations. One example that we discussed beforehand was the construction of a well. For its planning, it would be important to know which households and villages would realistically have access to this well or which would be cut off from the supply due to being too far away.

Arrival and Visit of Project Areas

The internship had in total a length of 9 weeks, which were completely conducted in Togo. The first weeks the main goal was to get an impression of all the implemented projects by Natureoffice GmbH, therefore we travelled through the regions with our colleagues, which was mostly by car, and we were visiting the different locations. In total that meant we were visiting eight different villages, which were located in a very rural environment and by that were sometimes difficult to reach by car. The partly extreme weather conditions with heavy tropical rain made it from time to time impossible to get to a certain village by car.

Then we would have to change the transportation to motorbikes. This is being mentioned, because it stresses the precarious situation the inhabitants of those villages find themselves in. Being cut from bigger roads or an adequate infrastructure makes it impossible for some of these people to be efficiently a part of normal life in non-rural areas. The eight villages mentioned above were, Adamé, Aboudjokopé, Glypko, Intivikopé, Kotokopé, Sokporkopé, Fokpo and Kologon. Visiting these villages we also met the most important people in the social construct of a Togolese village like we experienced it, the “chef”. The chef claims a role in the village that is comparable to that of a mayor, village elder or person in charge. At least that's what we were told. He is also not elected, but the position is inherited through the family structure. The village chefs are very important for the villages in this sense, as they are the direct contacts for the planning and implementation of projects. At the same time, however, they are not the only contact persons, as there is direct cooperation with some villagers, who secure a source of income through their involvement in the projects that was not previously available. The cooperation is often in the areas of maintenance and care of the forests or planting new trees. In these weeks we were getting to know the area and also the population which is directly affected by the implemented projects.



Image 1: Data collection process in the field

Data Collection

The Data collection was conducted during a time span of around 4-5 weeks, which were work-intensive, also because of the travels to the different project locations. The weather conditions, like heat or tropical rain were sometimes exacerbating the collection of the data points. The collection itself was separated into two parts. The first step was the measuring of GPS points, distances and polygons. For that we used the Garmin GPSMAP 65 device, which worked perfectly fine without any difficulties. The second step was the correct documentation of every data point, for which we used a Sony Alpha 7 camera for taking photos, as well as an excel list

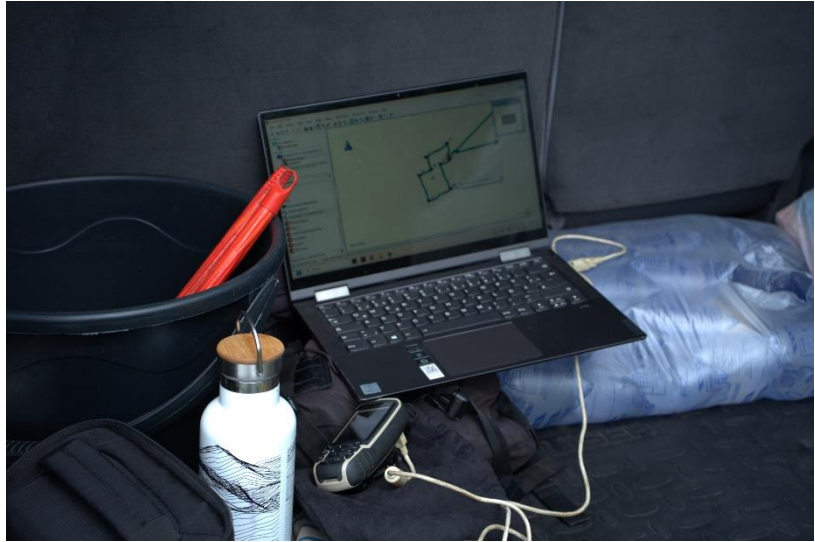


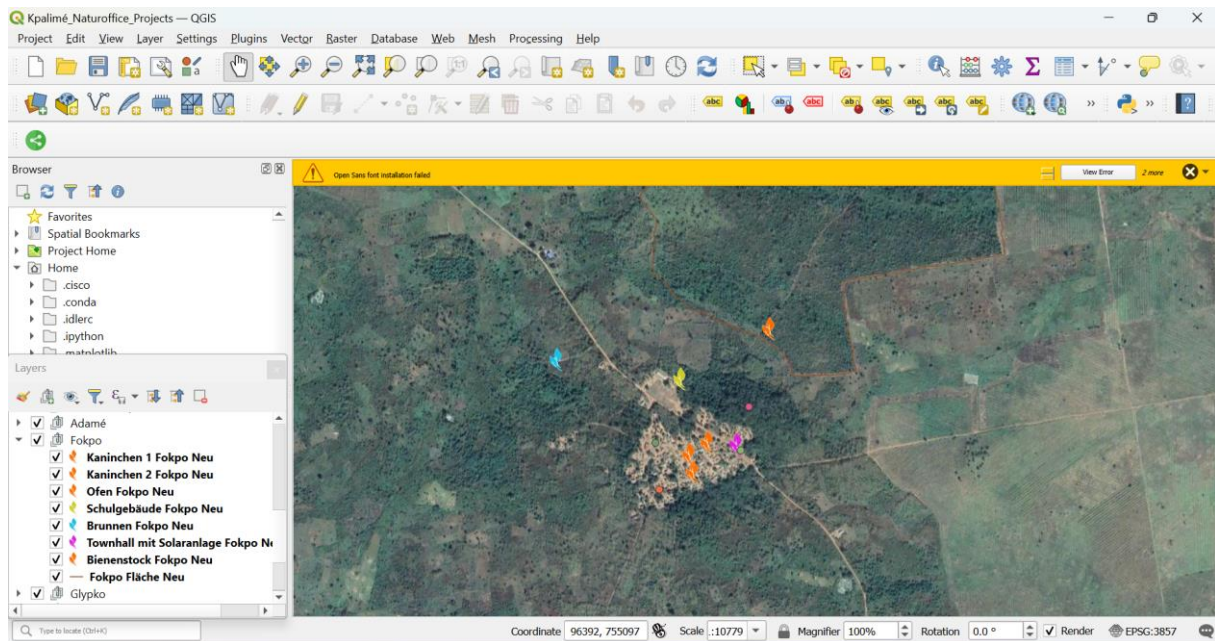
Image 2: Inserting the GPS Data in the Garmin Basecamp program

to note every successfully collected point. This was necessary for the comparison with internal company files, in which all projects were listed. Most of those weeks, the data collection was conducted Monday to Wednesday and Thursday to Friday, the data was analysed, brought into digital form, organized in folders and transferred into QGIS. In retrospective, the data collection was probably the most important part of this internship, due to the importance of clean valid data for a successful use.

Map Creation with QGIS

QGIS was used for the creation of certain maps, which were requested by the company. The first main map was containing every project, which is part of Project Togo. That also included some descriptions and a detailed classification using the project type as classes. We created groups for Forestry Projects, Socio-Economic Projects, Water-Projects, Sanitation Projects and Education Projects. We chose this way of classification, because in our opinion that made most sense. The difficulty here was certainly to ensure the complete and correct integration of the data, which is why data collection in advance was particularly important. We deliberately took enough time with this so that the data was ultimately clean and accurate. With the large number of projects for which *Natureoffice GmbH* is responsible, it was important to maintain an overview and assign the projects to the right places. An exemplary picture of this can be seen in Map 1, which shows the principle of how we were working with QGIS. The reason why it is not an actual map, is because

the goal was not to create a visualized proper map as shown in map 2, but an interactive tool for localizing and planning all the projects.



Map 1: Screenshot of interactive QGIS for internal company use, including an example of the project classification

Another map we created was more based on a micro-level analysis of the client forests, a project, in which trees were planted, which were paid by client companies. In this map we did data collection in a single forest to measure the specific areas of clients, which had all in theory separated areas within the forest. In reality it was sometimes complex to set the frontier of one client area to another. I realised that the vegetation and local conditions can often make data collection difficult. The forest was so densely overgrown in places that we needed the support of the foresters, who cleared the paths for us. What is particularly positive is that our colleagues from *Ecocent Togo* worked very conscientiously and were present during both the tree planting and the inventory. As a result, they knew exactly where to find which tree boundaries. After the measuring, we could use QGIS to visualize the different client areas within the same forest, which is extremely helpful for the company for future planning of planting the different surfaces.

Around the different forest the company was often building firebreaks to ensure that in case of the outbreaks of wildfires, the compensation forests as well as the client forest would not be damaged by the fire. For circumstances like those, the company really has to take precautions.

Map Creation with Leaflet

The second most relevant task of the internship was the creation of a map with the purpose of being published on the company website to guide interested customers through the different projects, including a localization, description, photos and videos. All of this should also be adequately designed. First, I tried to fulfil this task with QGIS, since it is a tool, which I know and which I know how to use well. Quickly I realized that the program has its limits when it comes to

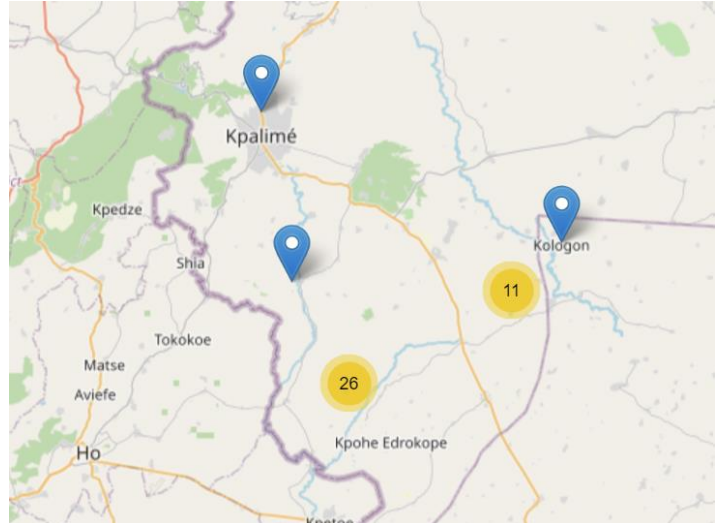


Image 3: Screenshot of the Leaflet map including the project clusters

having a graphically pretty web-map. The best solution for that case was apparently Leaflet, which I never used before and which is a coding-based tool for map-creation. In the beginning it was not easy to understand the working mechanism, because it works on a completely different level than QGIS, but finally I learned to use it properly and successfully created the requested map. The use of Leaflet is also one of the practical key findings, I learned through this internship.

Maintenance of Project Areas (Planting, Inventory, Arboretum)

A minor part of the internship was supporting small projects and daily tasks in the company. This could be for example the planting of new trees either in the offsetting forests or the client forests, counting the tree inventory in certain forest parts or helping a colleague with the procedures in the arboretum. The tree inventory is a very important task in the field of offset projects, because a valid number of trees must be guaranteed to proceed with the projects and the trading mechanism to have a trustworthy and working offsetting tool. Also mentionable is the weekly “jour fix”, which was a meeting in which all necessary and relevant topics were discussed with the whole team. That meeting normally took multiple hours.

Results

Even if some of the tasks were challenging in the beginning, we came to good results in the end, which also benefitted by good teamwork. All the task we were doing were satisfying the team and our project management, especially the internship supervision. We were very happy with the results of the different maps and we are looking forward to the moment when the Leaflet map is being published on the company website. The maps can be used for further project planning as well as a detail spatial documentation of the project implementations.

Academic background as a geographer specialized in Human Geography

The internship was interesting, instructive and also challenging in many respects. In this section, I would like to go into detail about the extent to which my academic background as a human geographer helped me during this time, both professionally and personally, what I benefited from and what I ultimately learnt and to what extent the internship was an enrichment for me.

Firstly, a bit about the professional background. During my bachelor's degree in geography in Munich, I learnt more generalist about these areas, but I took several courses in GIS, geoinformatics and environmental remote sensing, which helped me a lot during my internship. During my studies, especially in my Master's degree in Human Geography, I took a lot of courses focussing on the Global South, trade relations between the Global South and the Global North, and developments in these regions. I took a course, in which I researched the substitution of agricultural input products in Kenya's Embu County with a group. This course was extremely helpful to me in many ways. Firstly, it was very interesting to be able to draw a comparison between an East African and a West African country, as well as a country which, according to the statistics, is even more underdeveloped than Kenya and has significantly less wealth and economic power. I think it was essential that my previous Bachelor's and especially my Master's degree gave me an understanding of why the global South, especially many regions of Africa, are underdeveloped and in some cases cannot keep up with the global North. At the same time, it was also exciting to see how in Kenya and in Togo the influence of China through participation in infrastructure and other projects is rising. We were also speaking with some local people about that topic and the opinions are dividing. To understand the climate change, the physical consequences of that and by that the consequences for the human my studies gave me the perfect preparation to understand the local climate and also for having some thoughts on the future of a lot of people who are gaining their main income through agricultural production. Also courses such as "environmental management" in my bachelor gave me a good understanding of the principles of carbon offsetting. All in all, I would definitely say, that the internship was perfectly suiting for someone with my academic background and I felt very well prepared for this project in practice, especially because of the focus on the global south during the first year of my Master program.

Reflections

I was able to successfully apply and deepen a variety of skills that I had learnt in previous jobs or internships as well as in my Bachelor's and Master's degree programmes. At the same time, I also learnt new things, such as the use of new programmes (e.g. Leaflet) or the practical application of my GPS skills. Personally, I am particularly pleased that I was able to raise my French skills to a

good level again, as the language exchange only worked in French on a permanent basis, as this is the official language of the country and the local colleagues were Togolese.

The company *Natureoffice GmbH* as well as the partner company *Ecocent Togo*, which I will refer to as one in the following paragraph, were very welcoming and supporting during the full period of the conducted internship. It is not an easy for a student to work in an unknown environment, far away from usual surroundings, especially in the global South in countries which lack of development. 9 weeks in Togo are a commitment, in which one commit to the company, to the project and also to the adaption to the environment, culture and people. Those are circumstances in which it would be valid to be concerned, to feel homesick or maybe even lonely. All of these concerns can be fully denied, with great gratitude to the whole team of *Natureoffice GmbH*, including the executing Togolese co-workers in Kpalimé, as well as our project coordinator in Germany, who was always consulting remotely, whenever needed. The company treated us equally and gave us the feeling that our opinions matter and are well received. The accommodation, transportation as well as the provision of necessary working tools were always completely satisfying. Regarding the transportation comes also a security aspect, which is worth mentioning. *Natureoffice GmbH* never let me alone go into the villages or to other project areas, and I was always supported with at least one co-worker. In conclusion I was say that me and my internship colleague were perfectly hosted, respected and became very quick appreciated members of the team.

The following paragraph will express my reflection about the actual work we have done and my personal opinion about the work *Natureoffice GmbH* is doing, at least as far as I can judge it. I see the work we have done as useful, as it supports the company in the efficient and effective realisation of its projects. I also see the overarching goal of implementing a climate protection measure through the compensation projects, not only in theory but also in practice. I would like to emphasise that all of *Natureoffice GmbH*'s projects were very trustworthy, and relevant factors such as counting tree plantations, measuring areas etc. were carried out very conscientiously.

Conclusion

The internship was an extremely instructive experience, during which I learnt a lot, all mentioned above. I am very grateful for the unique experience I was able to have with *Natureoffice GmbH* and *Ecocent Togo* and I am very happy about the insights I gained into project work, but also into the country's culture and people.

Togo is a diverse country, which is located in a state structure that, in my opinion, does not currently make sustainable development with a bottom-up approach fully possible. The country offers a lot of potential for development, has an extremely young population and has a deep-sea harbour that is building a base for international trade. Meanwhile the mainly agricultural population will face certain threats, such as the climate change, which will make life in the tropical environment even harder and weather circumstances for the population even more unpredictable. I think it will be exciting to see how Togo will develop in the future and how it will participate in a fully globalized world.

Finally, a big THANK YOU to *Natureoffice GmbH* and *Ecocent Togo* for making this endeavour possible for me and my colleague.

Literature

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Maps

Map 1: Screenshot of interactive QGIS for internal company use, including an example of the project classification

Map 2: Visualization and Localization of all different client areas in the client forest of Sokpokopé including the amount of hectare per client and the amount of trees per client

Figure

Figure 1: Figure 1: Illustration of the company structure of Natureoffice GmbH and its NGO-partner Ecocent Togo, including each responsibilities

Images



Image 4: Discussion and Learning about the construction of sustainable ovens for villagers for the purpose of better health (by less pollution) and better finances (by using less wood)



Image 5: Meeting the chef's wife in the village of Aboudjokopé



Image 6: Heavy weather conditions, like tropical heat with a high degree of humidity, complicates the work in the field, for us, as well as for the local workers

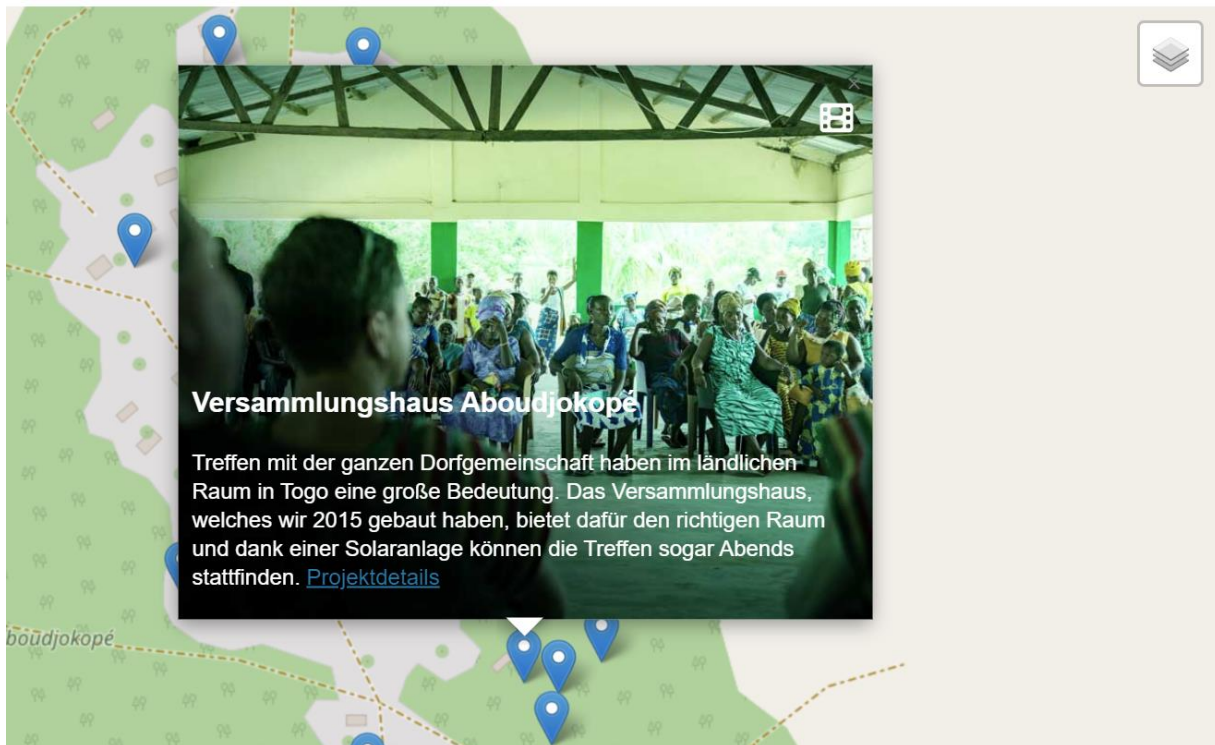


Image 7: Screenshot of the created Leaflet map, with an open Pop-up window, which includes a project description and links to more details as well as a video of the project



Image 8: Listening to a workshop, conducted by Ecocent Togo and an agricultural expert, to teach the villagers a sustainable and more profitable way of planting manioc roots



Image 9: Warning label at the border of the client forest of Adamé, which interdicts unauthorized entry to the forest



Image 10: Learning about different trees and their seeds in the arboretum



Image 11: Rabbit culture as an additional income and food source, implemented by Natureoffice GmbH



Image 12: Water fountain for the villagers of Aboudjokopé



Image 13: Local soap manufacturing as additional income source in Aboudjokopé