sDiv working group meeting summary

"sMonodominance - Towards a unifying theory of the emergence and maintenance of monodominance in species-rich tropical forests"

The two main expected outcomes of the workshop have been 1) to establish a network of researchers working on monodominance and percolation theory and 2) to develop a concept for a manuscript for a new review on monodominance.

To achieve these aims 1) we allowed all participants to introduce themselves in a 5-10 minutes introduction at the beginning of the workshop. Already in this introduction there have been several lines of general discussion: 1) What is a good operationalizable definition of monodominance? On what spatial and temporal scales does monodominance occur? 2) What is the pre-European human impact on the establishment of monodominant stands? 3) What is the dynamical perspective of monodominance? 4) More focus on soil.

We had several formal presentations on the key papers for the workshop of Kelvin Peh et al. reviewing mechanisms leading to monodominance and the paper by Pia Backmann et al. on a simple model marrying monodominance and percolation theory. We had also an introductory lecture by Alexander Hartmann on methods from statistical physics that may be important for our work (e.g. finite size scaling). In addition Felix May has given an impulse talk how we can exploit the terminology and theories explaining species diversity for the research on monodominance.

In subgroups we discussed more specific topics: 1) What can we learn from traits of monodominant species led by Tiffany Knight. And also what data bases are available to do this. 2) What processes should be first added to our existing model and how should they be implemented. Especially the role of negative density regulation has been discussed and also the role defaunation. This group has been led by Pia Backmann. 3) Andreas Huth has led a group on methods to analyse and validate models of monodominance. Percolation theory and remote sensing had been discussed in detail.

Explicitly we have planned to write a review on monodominance where we will compile our thoughts on the definition and separation of the terms monodominance, hyper-dominance, and succession. Focusing on the dynamics, i.e. creation and extinction of monodominant patches. Comparison to dominance in other systems (i.e. grass lands). Including the

human perspectives (e.g. indigenous people have domesticated plants in the Amazon before Europeans arrived). This paper project will be led by Pia Backmann and Juergen Groeneveld.

Another project suggested by Tiffany Knight could look at the trait characteristics of the monodominant species exploiting both the available plot data (RAINFOR and AFRITRON) and the available trait data bases (TRY, sPlot).

Tiffany Knight suggested also a Master project to do a congeneric comparison of monodominant and non-monodominant species of the same genus (e.g. Gilbertiodendrum).

On the last day we used google earth to get a rough impression whether remote sensing could be used to identify and monitor monodominant patches in New Caledonia, Kamerun, and Brazil.

We guess we have achieved a balanced distribution of presentations 33%, work on output 33%, and brainstorming 33%.

The overall atmosphere was very open and stimulating. Given the diversity of the group I assume that the majority of the participants really enjoyed the workshop. We are confident this conclusion is also supported by the results of the participant survey.

The most concrete next step is the preparation of a draft that Juergen Groeneveld and Pia Backmann will share between the participants as soon as possible. We expect vivid discussion and interaction among the group. A positive sign is that we already exchanged some analysis, papers and ideas after the work shop. Applications for joined post docs were also discussed at the workshop.

We will have a second workshop in January 2017 where we will continue this great interaction.