Bayesian Network Evaluation Notes

*Expert 2*

This document contains the notes of the evaluation of the Bayesian network with a domain expert. It first briefly describes the introduction to Bayesian network given to the domain expert. Second, the questions asked for the evaluation are given. The last part of the evaluation contains the notes made during the evaluation.

The Bayesian network used for evaluation can be found [here](https://github.com/tjanmaat/Thesis/tree/master/Bayesian_Networks) (<https://github.com/tjanmaat/Thesis/tree/master/Bayesian_Networks>). It is named ‘Figure18\_Network3.xdsl’.

# Bayesian Network Introduction

First, Bayesian networks were introduced to the domain expert. This was done through the following steps:

* Explain that arcs indicate correlation between nodes.
* Explain that each node has state and conditional probabilities.
* Show how this works by taking nodes CarbonSupplementUse and SoilOrganicMatterContent as an example.
* Note difference between correlation and causality.

# Questions

For 3 to 5 nodes, the conditional probability table was opened, and the following questions were asked:

* Do other nodes in this network directly influence this node?
* Is the influence of one of the influencers of this node negligible?
* Are the conditional probabilities given here obtainable?

The following questions were asked about the network as a whole:

* Do you think this model would be applicable outside LLC? Why (not)?
* Do you see any discrepancies in level of detail in this model?
* Do you have any remarks?

# Notes

The soil evaporation is influenced by soil temperature at the surface, but this will not be too different from air temperature which can therefore work as a proxy.

The CO2 concentration could be included, as atmospheric pressure might not be a good proxy for the gas exchange. Taking atmospheric pressure as a proxy for concentrations of air particles, dismisses the influence the microclimate has on these concentrations, which is a relevant factor. The gas exchange also influences water evaporating from the soil and water transpiring from the plant.

Mycorrhiza makes nutrients available to the plants. It should therefore influence plant available nutrients directly, instead of via the acidity of the soil.

For some nodes, the availability of data depends on the physical scale of the system. For example, data on the climate can be obtained quite easily for an area of a few hectares, but the differences in microclimate between the top and the bottom of a hill are hard to find in this data.

Instead of grouping tree species in genera, it might be better to look at plant functional types. This grouping relates more closely to how the data is being used in the model.

If this model would be improved to the point that it would work for Land Life Company, it would be more broadly applicable.