KOLLAPS DES AMAZONASREGENWALDES – ENTWICKLUNG, INDIKATOREN UND SZENARIEN – EIN ÜBERBLICK

DIEBACK OF THE AMAZON RAINFOREST – DEVELOPMENT, INDICATORS AND SCENARIOS – REVIEW

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SUMMARY

Within the global Earth system, the rainforest ecosystem is of paramount importance in terms of its diversity, its ecosystem service functions, its carbon storage function and its regulatory climate function. However, due to progressive deforestation and forest degradation together with increased droughts and fires in the Amazon rainforest, carbon uptake per year in 2010-2020, for example, has more than halved compared to 1990-2000. In drought years such as El Niño, the Amazon rainforest is already a source of CO_2. In total, 85.3 million hectares of the Brazilian Amazon rainforest will be deforested by 2022, which corresponds to an area of 21.2 %. Added to this are the forest areas degraded by fire, logging and forest edge effects. If these are overlaid with the areas affected by drought, 38 % of the rainforest is degraded. Due to increasing deforestation in the tropical rainforests and global climate change with rising CO_2 and temperatures, the role of these processes on the resilience and the risk of a collapse ("dieback") of the rainforest ecosystem has been increasingly discussed and investigated since the 1990s.

The aim is to provide an overview of the status of the discussion on the collapse of the Amazon rainforest based on the literature review, whereby the development of the model development with its statements on the "dieback" and associated threshold values as well as the empirical-analytical findings on climate, vegetation and climate change are analyzed.

There are direct indicators of a changing rainforest ecosystem with: increased tree mortality, more drought-tolerant tree species, reduced tree growth and invasive grasses that further increase the risk of fire as the canopy opens up. In addition to the significant regional increase in temperature, water stress for tree vegetation has increased significantly, particularly in the eastern Amazon, especially due to the drought years that have occurred more frequently