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Soil Physico-Chemical Characteristics in a Secondary Succession

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Forest fires, whether accidental or intentional, are likely to cause substantial changes in both the biotic and abiotic communities. The effect of forest fires on soil characteristics are not only traced to the feedback between emergent vegetation types and the soil but may also be due to the previous vegetation that was subjected to the burning incident.

Hence, information and data on forest fire effects should be based on site- and problem-specific studies for these succession data to be more useful in resource management planning and decision-making.



The study was conducted from April 1997 to January 1998 in Busol watershed. The permanent plot selected for the study covers approximately 5000 sq. m. It is one of the severely burned areas of the watershed due to a fire of unknown origin that broke out February 23, 1997.

The slope in the selected area is generally undulating and ranges between 20-25%.

Precipitation is between 3300 to 3400 mm annually with 90% falling during May to October. Annual mean temperature averages 19.2^o C. Based on the United Soil Classification System, the soils in the Busol pine forest are silty sands, sand-silt mixtures although a third of the selected research site is observed to have soils of clayey sands, sand-clay mixtures.



The effects of the forest fires in Busol indicate that soil dynamics may play a role in the management of ecosystems that are earmarked for agricultural purposes.

The study aimed to:

- gather physico-chemical data over a ten-month period on forest soil samples in a burnt area of Busol watershed
- compare pertinent soil physico-chemical characteristics before and after the forest fire in Busol; and
- study the soil dynamics attendant to the development of the animal and vegetational communities in a secondary succession.

Data on organic matter content; pH; levels of exchangeable aluminium, nitrogen, phosphorus, potassium and sulfate; lime requirement; and a number of physical soil characteristics were monitored bi-monthly during the research period.

A decline in the values of these physico-chemical characteristics was generally evident in the first four months of

the study but the decline was observed to be non-persistent. Values were then re-established to the levels observed before the forest fire.

High concentration was obtained among the observations, particularly the pH values in water and in Ca Cl_2 and the different characteristics that define soil-water dynamics.

In conclusion, no dramatic decline in any soil-physico chemical characteristics persisted over the ten-month period. But the effects of the forest fires in Busol indicate that soil dynamics may play a role in the management of ecosystems that are earmarked for agricultural purposes. To contribute to a more comprehensive baseline and applied succession data, the conduct of similar studies that are site- and problem-specific is also recommended.

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