# 61st FEFCO

第61回森林生態系機能コロキウムは、本年度の若手外国人農林水産研究者賞の受賞者のお一人、Tovohery Rakotosons博士にご講演いただきます。（https://www.jircas.go.jp/ja/event/2022/e20221122_japanaward） 幅広い農学関係の研究者のご参加をお待ちいたします。京都大学農学研究科熱帯環境学研究室がホストを務めます。

61st FEFCO
2022/11/25 16:30 - 17:45
Faculty of Agriculture Main Building, W214
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## Addressing phosphorus deficiency in rice in sub-Saharan Africa

Phosphorus (P) deficiency is a major limiting factor for rice production in sub-Saharan Africa (SSA). Our study identified that the application of organic materials such as rice straw and farmyard manure (FYM) increases P availability through microbial-mediated reduction of iron (Fe) oxides with subsequent solubilization of Fe-bound P in soils increasing P uptake and biomass of rice. The use of isotope dilution technique confirmed that FYM application enabled the use of otherwise insoluble P pools in soils and enhanced P uptake of rice plants. The effect of FYM application against P deficiency was also demonstrated on farmers' lowlands in Madagascar with greater impact in soils with low pH and low carbon contents. The extensive survey identified that the soil P fractions in the central highlands of Madagascar are mostly insoluble forms bound to Fe and (aluminum) Al oxides. These findings should promote the locally available organic resources to more efficiently utilize insoluble P pools in soils and enhance lowland rice production in the region. We also identified that a micro-dose of NPK fertilizer applied to the nursery bed produced more vigorous seedlings, resulting in higher grain yields and higher profitability compared to the current farmers' fertilization practice for lowland rice production in Madagascar. Our findings are relevant to integrated fertilization management using locally available organic resources and small amounts of mineral fertilizer to address the typical P-deficient soils in SSA and efficiently increase the lowland rice production in the region.

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