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Adoption of Resource Management Technologies in Small-scale Farming Systems: A Matter of Resource Poverty or Knowledge Compatibility? Experiences with Legume-based Technologies in Southern Benin and Northern Nigeria

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Abstract

Resource management technologies (RMT) are to fulfil long-term objectives rather than subsistence-securing goals. Furthermore, RMT are reputed to be knowledge-intensive, transformational of whole farming systems, and therefore not acceptable for smallholders. To circumvent these adoption inhibitors, there is a consensus in the legume research literature that legume-based technologies (LBT) should be targeted without emphasis on their resource management attributes. As in the present study, which was conducted in southern Benin and northern Nigeria, multi-purpose grain-legumes should be promoted for their multi-functionality in delivering grain for food and biomass for soil fertilisation or livestock feeding. Green manure legumes should be targeted primarily to serve concrete needs such as combating *Imperata* or *Striga* and not per se for soil improvement. By using legumes in these or similar utilitarian senses, farmers would unintentionally strive for resource management as collateral effect.

In order to detect the particular circumstances that favour farmers' utilisation of LBT in the humid and dry savannahs of West Africa, two baskets of herbaceous legume options consisting of green manure, forage, and grain-legumes were introduced along the resource-use gradients in southern Benin and northern Nigeria.

The improved varieties of grain-legumes were accepted independently of any further special circumstances but depending upon their relative advantages over local varieties. Surprisingly, the acceptance of the non-grain legumes did not depend on any special biophysical or socio-economic context. Local knowledge on soils and fertilisers was the main driver for the acceptance of these legume options. In southern Benin farmers chose both grain and green manure legumes that they used on differentiated fields according to local field and fertiliser taxonomy. In northern Nigeria, however, the local taxonomy of soil fertilisers and feedstuffs attributed to the offered green manure or forage legumes the same value as that of native grasses, which were not considered worth of adoption. In the latter case, the explanatory power of resource poverty as determinant of the uptake of LBT by smallholders was biased by farmers' knowledge.

In conclusion, both local knowledge and farmers' circumstances need to be addressed for promoting LBT more successfully.

Keywords: Benin, knowledge compatibility vs. resource poverty, legume adoption, Nigeria, resource management technologies