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## Sustainability of innovation adoption under smallholder cattle production systems in Eastern Indonesia and Timor Leste

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### Abstract

After more than 20 years of our collaborative research, several innovations have successfully improved productivity of cattle in the smallholder system in eastern Indonesia and Timor Leste. During 2004–2021, an integrated production system of Bali cattle (*Bos javanicus*) based on controlled natural mating, better feeding and early weaning was trialed in the west Nusa Tenggara region and successfully increased calving rate from 60 % to 85 %, reduced calf mortality from 15 % to 5 % and increased weaning weight from 70 to 90 kg. This proof of concept was successfully scaled out to 36 farmer groups in the region. However, wide adoption of this production model was not sustainable beyond the project life due to failure of the community to sustain best practices without external facilitation. In addition, subsequent government programmes and supports did not support a continuous adoption. Various successful trials on improved feeding systems based on introduced forages, crop residues and industrial byproducts, have not also been adopted widely. Learning from these outcomes, starting from 2011, a tree legume-based cattle fattening system was introduced. Two tree legumes; *Sesbania grandiflora* and *Leucaena leucocephala* have been widely adopted with different magnitudes. *Sesbania* adoption has been limited to southern part of Lombok Island where it suits best, while *Leucaena* have been adopted in much wider dry areas of Eastern Indonesia and Timor Leste. By 2022 it is estimated that at least 5000 farmers in eastern Indonesia and Timor Leste have adopted this leucaena based cattle fattening system. The key to the wide and sustainable adoption of leucaena based cattle fattening system are: the technology is simple but significantly increases cattle growth rate from 0.2 to 0.5 kg-1, farmers see the immediate financial benefit, leucaena is best suited to the dry areas, it does not require high inputs such as irrigation and fertilisers, it matches the local practice of cutting trees rather than cutting grasses, and leucaena can be harvested continuously for at least 25 years since establishment.

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