Supplementary Material

Sup Table 1: Total systems' energy and protein yield calculations for different cropping systems

Cropping System	Systems' energy yield (GJ ha^{-1}) calculations	Systems' protein yield (kg ha^{-1}) calculations
Maize sole	$(MZ_{yield} \times Kcal_{maize} \times 10)/GJ_{Convrt}$	$MZ_{yield} \times Prot\%_{maize}$
Maize-Legume Intercrop	$(MZ_{yield} \times Kcal_{maize} \times 10 + LEG_{intercrop} \times Kcal_{legume} \times 10)/GJ_{Convrt}$	$(MZ_{yield} \times Prot\%_{maize}) + (LEG_{intercrop} \times Prot\%_{legume})$
Maize-Legume Rotation	$(½ \times MZ_{yield} \times Kcal_{maize} \times 10 + ½ \times Leg_{rotation} \times Kcal_{Legume} \times 10)/GJ_{Convrt}$	$(½ \times MZ_{yield} \times Prot\%_{maize}) + (½ \times Leg_{rotation} \times Prot\%_{legume}$

"Maize sole" refers to both CA Sole and Conventional sole systems (cf. Table 1). MZ_{yield}, $LEG_{intercrop}$ and $LEG_{rotation}$ refer to the year-specific yield of maize, intercrop legume and rotation legume, respectively. $Kcal_{maize}$ and $Kcal_{legume}$ are the kilocalories (kcal) per 100 g of maize and legumes seed, respectively. $Prot\%_{maize}$ and $Prot\%_{legume}$ are percentage protein content of the grain for maize and involved legume, respectively. GJ_{Convrt} is a conversion factor from kilocalories to gigajoules (i.e., 238845.897 kcal GJ^{-1}). The grain protein and calorie conversion factors were obtained from (USDA, 2021) .