Annex D: Calculations of the marginal rate of substitution for continuous and effect-coded variables.

The estimated indirect utility function emanating from a cropping system:

$$U = \beta_0 \times CURR + \beta_I \times INCOME + \beta_L * LABOUR + \beta_C \times CASH + \beta_{LLO} \times LMLOSS + \beta_{HLO} \times HMLOSS + \beta_{LF} \times LOFERT + \beta_{HF} \times HIFERT$$

The attributes MAXLOSS and FERTILITY were effect coded to avoid interactions with the status-quo parameter.

For continuous attributes, let us take the case the labour requirement attribute (LAB). We calculated the difference in income (Δ_I) (all other attributes kept constant) that would be required to keep the utility constant if the LAB requirement were increased by 1 unit (here %). Since all the other attributes remain constant, we can translate this in terms of utility as:

$$\beta_I.(INC + \Delta_I) + \beta_L.(LAB + 1) = \beta_I.INC + \beta_L.LAB$$

Thus, to compensate for the additional labour, we require an additional income of $\Delta_I = -\frac{\beta_L}{\beta_I}$.

For effect-coded attributes, let us take the case of a lower maximum loss. We calculated the difference in income (Δ_I) (all other attributes kept constant) that would be accepted to keep the utility constant if the Max Loss decreased from the current situation to a lower Maximum Loss. By the definition of effect coding, for the base situation, we have $LMLOSS = HMLOSS = -1$; and when the lower maximum loss situation, we have LMLOSS = 1 and HMLOSS = 0. Since all the other attributes remain constant, we can translate this in terms of utility as:

$$\beta_I.(INC + \Delta_I) + \beta_{LF} = \beta_I.INC - \beta_{LF} - \beta_{HF}$$

Thus, to compensate for a lower max. economic loss, we can accept a change of income of

$$\Delta_I = -\frac{(2 \times \beta_{LF} + \beta_{RL})}{\beta_I}$$

Table 1 : Comparison of the MRS obtained using the conditional logit (CL) and the mixed logit (MXL) models

Attributes	Using CL	Using MXL†	
	Mean	Mean	Median††
Labour	0.59	0.77	0.72
Cash outflow	0.5	0.47	0.40
Max. Economic Loss (Lower)	-43.15	-57.97	-53.21
Max Economic Loss (Higher)	16.55	26.98	21.82
Fertility (Lower)	134.91	194.00	180.92
Fertility (Higher)	-33.74	-58.23	-52.85

† MRS based on the unconditional estimates of the mixed logit model following the procedure suggested in Hensher et al., 2015.
†† When using the MXL model coefficients, the MRS are a ratio of two random variables, resulting in skewed results. Therefore we have also calculated the median value.

In order to check the credibility of the results, we used the following technical information about average maize cropping systems in the study area (Table 2).

Table 2 : Characteristics of an average maize cropping systems in the study area

	Average value	Unit
Yield	4,000	Kg/ha
Price	1,300	Kip / Kg
Exchange rate	8,700	Kip/USD
Labour requirements	50-70	Man-days
Cash Requirements	2,000,000 – 2,500,000	Kip/ha