

Supplementary Material

Description of the Parametric Programming Matrix

VARIABLES	Purchasing	Producing	Multi-purpose	HLabPu	HLabPr	HLabVs	PMilkPr	PMilkPr	PMilkVs
max	PuGM	PrGM	VsGM	-LW	-LW	-LW	PPu	PPr	PVs
LandIrrPr >=	0	LIrrPr							
LandNIrrPr >=	0	LNIrrPr							
LandIrrVs >=	0		LIrrVs						
LandNIrrVs >=	0		LNIrrVs						
FamLab >=	FLPu	FLPr	FLVs						
0 >=	HLPu			-1					
0 >=		HLPPr			-1				
0 >=			HLVs			-1			
MilkProdPu >=	-MilkPu						1		
MilkProdPr >=		-MilkPr						1	
MilkProdVs >=			-MilkVs						1
VCTot >=	VCPu	VCPPr	VCVs						

Objective function

Purchasing (Pu); Producing (Pr); Multi-purpose (Ms) = Farm types

PuGM, PrGM, MsGM: Gross margin per farm type calculated as GM = Revenues other than milk (minus) Variable expenses

LW—Hired labor wage

PPu, PPr, PMs—Price of milk per farm type (allowed to vary for the PPP model)

Constraints

Land

LandIrr/LandNIrr: Available irrigated and non-irrigated land in ha (for “Producing” (Pr) and “Multi-purpose” (Ms) farms)

LIrrPr, LNIrrPr: Required land per farm (for “Producing” (Pr) and “Multi-purpose” (Ms) farms)

Labor

FamLab available family labor

FLPu, FLPr, FLMs family labor requirements per farm (for “Purchasing” (Pu), “Producing” (Pr) and “Multi-purpose” (Ms) farms)

HLPu, HLPPr, HLMs hired labor requirements per farm (for “Purchasing” (Pu), “Producing” (Pr) and “Multi-purpose” (Ms) farms)

MilkPu, MilkPr, MilkMs Milk production per farm (for “Purchasing” (Pu), “Producing” (Pr) and “Multi-purpose” (Ms) farms)

Capital—Varying constraint (in RHS-PP)

VCTot—Available variable capital

VCPu, VCPPr, VCVs variable capital requirements per farm (for “Purchasing” (Pu), “Producing” (Pr) and “Multi-purpose” (Ms) farms)