

Table S1. Results of the One factor at a time (OAT) analysis.

TARGET VARIABLES																	
PARAMETERS	V1	V2	V3	V4	V5	V6	V7	V8	V9	V10	V11	V12	V13	V14	V15	V16	V17
ABROAD	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	43.0	0.0	0.0	0.0	0.0	0.0
ABROAD (Reasonable Range, RR)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	42.7	0.0	0.0	0.0	0.0	0.0
AIR	62.8	0.0	0.0	0.0	0.0	57.7	21.1	26.8	0.0	49.2	0.0	30.3	41.9	0.0	41.9	0.0	0.0
ARC	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0
AVERGOODS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	46.9	0.0	0.0	0.0	0.0	0.0
AVERGOODS (RR)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	47.1	0.0	0.0	0.0	0.0	0.0
AVERSTAY	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	50.3	0.0	0.0	0.0	0.0	0.0
AVERSTAY (RR)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	48.8	0.0	0.0	0.0	0.0	0.0
B	88.8	28.0	0.0	0.0	0.0	80.8	88.6	36.8	2.5	49.4	3.0	0.0	27.7	0.0	27.9	11.1	48.1
BIRBASE	326.6	98.1	0.0	0.0	0.0	304.7	295.8	135.6	9.1	194.6	4.0	0.0	120.5	0.0	120.2	37.7	189.1

											9						
											0		0				
CFBU											0		0				
EU	0.0	0.0	0.0	0.0	0.0	0.0	0.0	20.8	0.0	0.0	0	0.0	0.0	0	0.0	0.0	0.0
CO2F											0		0				
ACTO											0		0				
Rgav	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.1	0.0	0	0.0	0.0	0.0
CO2F											0		0				
ACTO											0		0				
Rgav											0		0				
(RR)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.1	0.0	0	0.0	0.0	0.0
CO2F											0		0				
ACTO											0		0				
Rgc	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.1	0.0	0	0.0	0.0	0.0
CO2F											0		0				
ACTO											0		0				
Rirrig	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.1	0.0	0	0.0	0.0	0.0
											0		0				
CPRE	0.0	314.1	0.0	106.7	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0	0.0	0.0	0.0
											0		0				
CPRE											0		0				
(RR)	0.0	359.8	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0	0.0	0.0	0.0
desal											0		0				
CORR											0		0				
ALEJ											0		0				
O	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3	3	0.0	0.0	0	0.0	0.0	0.0
desal											1		0				
CORR											0		0				
ALEJ											0		0				
O (RR)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.2	4	0.0	0.0	0	0.0	0.0	0.0
											0		0				
DIST1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.3	0.0	0	0.0	0.0	0.0
											0		0				
DIST2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	1.3	0.0	0	0.0	0.0	0.0
											0		0				
DIST3											0		0				
G	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	17.2	0.0	0	0.0	0.0	0.0
											0		0				
DIST3											0		0				
UK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	4.4	0.0	0	0.0	0.0	0.0

											0			0			
DIST4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.1	0.0	0	0.0	0.0	0.0
											0			0			
DVEF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	17.8	0.0	0	0.0	0.0	0.0
											0			0			
ECO2 E	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	19.8	0.0	0	0.0	0.0	0.0
											0			0			
ECO2 E (RR)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	19.7	0.0	0	0.0	0.0	0.0
											0			0			
EECB R	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	48.4	0	0.0	0.0	0	0.0	0.0	0.0
											0			0			
EICF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	46.4	0.0	0	0.0	0.0	0.0
											0			0			
EICF (RR)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	40.1	0.0	0	0.0	0.0	0.0
											0			0			
eIGCC	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	92.0	0.0	0	0.0	0.0	0	0.0	0.0	0.0
EVAP ORATI ON	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1	0.0	0.0	0	0.0	0.0	0.0
EVAP ORATI ON (RR)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8	0.0	0.0	0	0.0	0.0	0.0
											0			0			
EVTp	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1	0.0	0.0	6	0.0	0.0	0.0
											0			0			
FCO2 E	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	46.4	0.0	0	0.0	0.0	0.0
											0			0			
FCO2 E (RR)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	40.1	0.0	0	0.0	0.0	0.0
											0			0			
FLOW SEAR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0	0.0	0.0	0.0
											0			0			

FLOW SPRING											0			0			
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0	0.0	0.0	0.0
FODDER YIELD											0			0			
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0	0.0	0.0	0.0
FODDER YIELD (RR)											0			0			
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0	0.0	0.0	0.0
FUELS											0			0			
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	47.1	0.0	0	0.0	0.0	0.0
FUELS (RR)											0			0			
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	47.0	0.0	0	0.0	0.0	0.0
GCR											0			0			
	0.0	0.0	113.4	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0	0.0	0.0	0	0.0	0.0	0.0
GDPc aFACTOR											0			0			
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	1.3	0.0	0	0.0	0.0	0.0
GDPc aFACTOR (RR)											0			0			
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	1.3	0.0	0	0.0	0.0	0.0
GOLF CONR											0			53			
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0	0.0	0.0	0.0
GOLF CONR (RR)											0			53			
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0	0.0	0.0	0.0
GOLF LOSR											0			10			
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0	0.0	0.0	0.0
GOLF LOSR (RR)											0			97			
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0	0.0	0.0	0.0
GVEF											0			0			
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.1	0.0	0	0.0	0.0	0.0

HCRp ermab andon	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0
												0		0			
HCRa c	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0	0.0	0.0	0	0.0	0.0
												0		0			
HCRtr acks	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.4	0.0	0.0	0	0.0	0.0	0	0.0	0.0
												0		0			
HCRro ads	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.4	0.0	0.0	0	0.0	0.0	0	0.0	0.0
												0		0			
HCRu b	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	20.8	0.0	0.0	0	0.0	0.0	0	0.0	0.0
												0		0			
HOTE L ACCO MMOD AT LAND DEM	1.9	0.5	0.2	0.0	0.0	0.4	0.4	0.4	0.0	0.0	0	3	0.0	0.0	0	0.0	0.0
												0		0			
HOTE L ACCO MMOD AT LAND DEM (RR)	1.8	0.5	0.2	0.0	0.0	0.1	0.4	0.0	0.0	0.0	0	2	0.0	0.0	0	0.0	0.0
												0		0			
ICR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0	0	0.0	0.0	0	0.0	0.0
												0		0			
IR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0.0	93.4	0	0.0	0.0
												0		0			
IR (RR)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0.0	93.9	0	0.0	0.0
												0		0			
IR gavias	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0.0	2.8	0	0.0	0.0
												0		0			
IR gavias (RR)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0.0	2.6	0	0.0	0.0
												0		0			

												0			4			
IRCO												0			3			
NR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	8.5	6	0.0	0.0	0.0
IRCO												0			3			
NR												0			4			
(RR)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	8.4	4	0.0	0.0	0.0
IRLOS												0			4			
R	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0	0.0	0.0	0.0
IRLOS												0			4			
R (RR)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0	0.0	0.0	0.0
ISLAN												0			0			
D	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.6	0.0	0	0.0	0.0	0.0
ISLAN												0			0			
D (RR)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.6	0.0	0	0.0	0.0	0.0
Kc												0			0			
Kc	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.60	0	0.0	0.0	0.0
(RR)												0			0			
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0	0.0	0.0	0.0
Kn												0			0			
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.9	0.0	0.0	0	0.0	0.0	0	0.0	0.0	0.0
LOSS												0			4			
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.7	0	0	0.0	0.0	6	23.5	23.5	0.0
LOSS												0			4			
(RR)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.1	0	0	0.0	0.0	9	23.6	23.4	0.0
MAX												4			0			
ACCO												7			0			
MMOD												4			0			
ATION	48.3	0.0	0.0	0.0	0.0	47.1	26.8	20.7	3.2	43.1	4	0.0	0.0	0	39.8	39.7	0.0	
MAX												2			0			
ACCO												2			0			
MMOD	20.6	0.0	0.0	0.0	0.0	19.5	7.8	5.1	1.3	12.4	4	0.0	0.0	0	17.5	17.4	0.0	

ATION (RR)																		
MF GDPc											0			0				
a											.			.				
INMIG	64.7	18.7	0.0	0.0	0.0	60.0	49.7	27.3	5.7	39.6	0		11.7	0.0	0	24.1	0.0	0.0
MFAC											0				0			
TOR											.				.			
GDP	11.3	0.0	0.0	0.0	0.0	9.0	11.7	4.7	0.0	5.9	0		3.2	0.0	0	3.3	0.0	0.0
											1							
											0							
											1							
MFAC											2				0			
TOR											.				.			
IET	214.7	55.9	0.0	0.0	0.0	232.7	150.6	91.9	6.3	217.5	1		178.5	0.0	0	207.1	206.9	13.5
											0				0			
											.				.			
MIR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	27.7	0.0	0		0.0	0.0	0	0.0	0.0	0.0
											0				0			
											.				.			
MOR	2.9	0.6	0.0	0.0	0.0	2.9	2.1	1.2	0.1	1.8	9		0.0	0.3	0	0.8	0.0	0.0
											0				0			
MOR (RR)	2.9	0.0	0.0	0.0	0.0	2.9	1.5	1.2	0.3	2.0	8		0.0	1.2	0	1.0	0.0	0.0
NBEA CH THRE SHOL D											2				0			
											9				.			
	17.1	0.0	0.0	0.0	0.0	22.8	42.8	7.7	0.0	26.4	8		29.7	29.8	0	29.7	0.0	0.0
NBEA CH THRE SHOL D (RR)											2				0			
											.				.			
	0.5	0.0	0.0	0.0	0.0	1.5	2.3	7.3	0.0	2.5	8		4.6	3.5	0	3.5	0.0	0.0
											0				0			
NEEfa ctor	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0		32.2	0.0	0	0.0	0.0	0.0
											0				0			
NEEfa ctor (RR)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0		32.2	0.0	0	0.0	0.0	0.0
											0				0			
											.				.			
NGP	0.0	341.9	0.0	100.0	100.0	0.0	0.0	0.0	73.1	0.0	0		0.0	0.0	0	0.0	0.0	0.0

NGP											0			0			
(RR)	0.0	297.9	0.0	100.0	117.4	0.0	0.0	0.0	73.4	0.0	0	0.0	0.0	0	0.0	0.0	0.0
NONH																	
OT																	
ACCO											0			0			
M											.			.			
LAND											0			0			
DEM	0.9	0.2	0.0	0.0	0.0	0.0	0.1	0.2	0.0	0.0	0	0.0	0.0	0	0.0	0.0	0.0
NONH																	
OT																	
ACCO											0			0			
M											.			.			
LAND											0			0			
DEM											.			.			
(RR)	0.9	0.2	0.0	0.0	0.0	0.1	0.0	0.2	0.0	0.1	0	0.0	0.0	0	0.0	0.0	0.0
NONH																	
OT																	
ACCO											0			0			
M											.			.			
RATIO	0.5	0.2	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.0	0	0.0	0.0	0	0.0	0.0	0.0
NONH																	
OT																	
ACCO											0			0			
M											.			.			
RATIO											0			0			
(RR)	0.5	0.2	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.0	0	0.0	0.0	0	0.0	0.0	0.0
NOTO																	
URIST											0			0			
EMPL											.			.			
OY	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0	0.0	0.0	0.0
PEGc											0			0			
pl	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.4	0.0	0	0.0	0.0	0	0.0	0.0	0.0
PEGs																	
pl	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.0	0	0.0	0.0	0	0.0	0.0	0.0
PENIN											0			0			
SULA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	1.3	0.0	0	0.0	0.0	0.0
PENIN											0			0			
SULA											.			.			
(RR)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	2.8	0.0	0	0.0	0.0	0.0

											0		0				
PLRpc	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.0	0.0	0	0.0	0	0.0	0.0	0.0	0.0
PLRpc (RR)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.0	0.0	0	0.0	0	0.0	0	0.0	0.0
preFA CTOR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	31.5	0.0	0	0.0	0.0	0.0
preFA CTOR (RR)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	31.5	0.0	0	0.0	0.0	0.0
ptotFA CTOR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.7	0.0	0	0.0	0.0	0.0
ratioG	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	34.2	0.0	0	0.0	0.0	0.0
ratioG (RR)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	29.9	0.0	0	0.0	0.0	0.0
ratioU K	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	12.9	0.0	0	0.0	0.0	0.0
ratioU K (RR)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	11.2	0.0	0	0.0	0.0	0.0
REUS R	0.0	0.0	53.2	0.0	0.0	0.0	0.0	0.6	0.0	0.0	0	0.0	0.0	0	0.0	0.0	0.0
REUS R (RR)	0.0	0.0	64.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0	0.0	0.0	0.0
ROAD Sn	0.0	0.1	0.0	0.0	0.0	0.0	0.0	4.4	0.0	0.0	0	0.0	0.0	0	0.0	0.0	0.0
RPOP AQUIF ER	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0	0.0	0.0	0	6	8.9	8.9
RPOP AQUIF ER (RR)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0	0.0	0.0	0	5	9.3	9.2

RPOP											0			1			
CONR											9			9			
base	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.8	0	0.0	0.0	6	65.0	65.0
RPOP											0			1			
CONR											9			9			
base	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.7	0	0.0	0.0	6	65.1	65.0
(RR)											0			0			
RPSE											0			0			
WAGE											0			0			
PROP	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0.0	0.0	0	0.0	0.0
RPTR											0			0			
EATM											0			0			
ENTP	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0.0	0.0	0	0.0	0.0
RPTR											0			0			
EATM											0			0			
ENTP											0			0			
(RR)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0.0	0.0	0	0.0	0.0
RT											0			0			
RT	0.0	86.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0.0	0.0	0	0.0	0.0
(RR)											0			0			
RUNO											0			0			
FFcte	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0.0	0.0	2	0.0	0.0
RUNO											0			0			
FFcte											0			0			
(RR)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0.0	0.0	1	0.0	0.0
SCG											0			5			
SCG	2.1	0.6	0.0	0.0	0.0	0.0	0.6	0.5	0.0	0.0	0	0	0.0	0.0	3	0.0	0.0
(RR)											0			5			
SCG											0			2			
(RR)	2.3	0.6	0.0	0.0	0.0	0.0	0.1	0.6	0.0	0.0	0	0	0.0	0.0	9	0.0	0.0
SCO2											0			0			
E	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	5.5	0.0	0	0.0	0.0
SCO2											0			0			
E (RR)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	5.5	0.0	0	0.0	0.0

SEAD ES CONV R	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0	0.0	194.0	0.0
SEAD ES CONV R (RR)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0	0.0	148.9	0.0
SEAD ESCA P	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0	0.0	0.0	0.0
SEWA GE PROP TUR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0	0.0	0.0	7.0
SEWA GE PROP TUR (RR)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0	0.0	0.0	2.0
SFAC TOR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	6.1	0.0	0	0.0	0.0	0.0
SFAC TOR (RR)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	6.1	0.0	0	0.0	0.0	0.0
shipC APACI TY	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.1	0.0	0	0.0	0.0	0.0
ST	1.5	0.3	0.0	0.0	0.0	1.4	0.4	0.6	0.1	0.4	0	0	0.0	0.0	0	0.0	0.0	0.0
ST (RR)	0.8	0.5	0.8	0.0	0.0	0.3	2.8	0.1	0.5	2.1	0	0	0.0	0.0	0	0.0	0.0	0.0
TCNE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.4	9	0	0.0	0.0	0	0.0	0.0	0.0
TCEO	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	68.4	8	0	13.5	0.0	0	0.0	0.0	0.0
TCEO (RR)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	68.2	1	0	12.0	0.0	0	0.0	0.0	0.0

											1						
											1						
TCEO											1			0			
ne	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2	0.0	0.0	0	0.0	0.0	0.0
											0			0			
TCON	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0	0.0	0.0	0.0
BOV											2			0			
TCON	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9	0.0	0.0	0	0.0	0.0	0.0
CAPR											2			0			
OV	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7	0.0	0.0	0	0.0	0.0	0.0
TCON	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0			0			
CAPR											3	0.0	0.0	0	0.0	0.0	0.0
OV	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0			0			
(RR)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1	0.0	0.0	0	0.0	0.0	0.0
											5			3			
TCON	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9			5			
PORC											5			3			
TCON	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0			0			
PORC											3	0.0	0.0	4	0.0	0.0	0.0
(RR)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1	0.0	0.0	0	0.0	0.0	0.0
											2			1			
TCV	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	42.4	5	0.0	0.0	2	0.0	0.0	0.0
											5			3			
TCV											0			0			
(RR)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	41.9	5	0.0	0.0	4	0.0	0.0	0.0
											2			1			
TEMIG	36.1	8.9	0.0	0.0	0.0	25.2	20.0	15.0	1.0	22.3	3	0.0	0.0	3	11.6	10.8	10.8
BASE											6			3			
TEMIG	39.4	10.8	0.0	0.0	0.0	38.3	31.0	16.5	3.4	25.2	0	0.0	0.0	7	14.4	14.3	14.3
BASE											0			0			
(RR)											0			0			
TES	0.0	23.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0	0.0	0.0	0.0
TGER											0			0			
EURB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0	0.0	0.0	0.0
pc											0			0			

TGER EURB pc (RR)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
THRE SHOL D RO	129.7	20.6	0.0	7.0	51.0	152.2	124.5	55.7	3.9	147.1	8	129.8	0.0	3	143.5	143.5	6.4
THRE SHOL D RO (RR)	398.4	48.8	0.0	9.2	61.5	431.1	361.2	170.5	10.9	418.2	6	371.8	0.0	7	409.5	409.1	11.7
TINGB OV	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0	0.0	0.0	0.0
TINGC APRO V	0.0	0.0	0.0	0.0	101.7	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0	0.0	0.0	0.0
TINGC APRO V (RR)	0.0	0.0	0.0	0.0	102.3	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0	0.0	0.0	0.0
TINGP ORC	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0	0.0	0.0	0.0
TINMI GDPc a	0.2	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.2	0	0.0	0.0	0	0.0	0.0	0.0
TKWM 3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.4	7	1.5	0.0	0	0.0	0.0	0.0
TKWM 3 (RR)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.5	6	1.5	0.0	0	0.0	0.0	0.0
TMON T	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	41.8	5	0.0	0.0	0	0.0	0.0	0.0
TPP	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24.4	7	0.0	0.0	0	0.0	0.0	0.0

											0			0			
TRAC											.			.			
KSn	0.0	0.1	0.0	0.0	0.0	0.1	0.0	9.4	0.0	0.0	0	0.0	0.0	0	0.0	0.0	0.0
TRAC											0			0			
KSn											.			.			
(RR)	0.0	0.1	0.0	0.0	0.0	0.1	0.0	9.2	0.0	0.0	0	0.0	0.0	0	0.0	0.0	0.0
TREC											0			0			
RES	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0	0.0	0.0	0.0
TREC											0			0			
RES											.			.			
(RR)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0	0.0	0.0	0.0
TREC											0			0			
SELE											.			.			
C	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0	0.0	0.0	0.0
TREC											0			0			
SELE											.			.			
C (RR)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0	0.0	0.0	0.0
TSUC											1			0			
VOpc	62.0	13.3	0.0	0.0	0.0	13.0	7.6	13.5	0.0	11.9	3	1.1	0.0	3	3.6	3.1	0.0
											2			2			
TURC											.			.			
ONR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.6	3	0.5	0.0	0	34.6	34.6	0.0
TURC											2			1			
ONR											.			.			
(RR)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.7	4	0.5	0.0	9	34.5	34.5	0.0
WCO2											0			0			
E	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.1	0.0	0	0.0	0.0	0.0

V1: Built urban; V2: High quality vegetation proportion; V3: Gavias proportion; V4: Overgrazing index; V5: Fodder importation needs; V6: Resident population; V7: Equivalent tourist population; V8: Houbara habitat proportion; V9: Egyptian vultures proportion; V10: Electric energy consumption; V11: Share of renewable energy; V12: Per capita CO₂ emissions; V13: Groundwater recharge; V14: Groundwater pumping; V15: Desalinated water; V16: Brine production; V17: Treated sewage proportion; V18: Recycled waste

Mathematical formulation of the model

(In alphabetical order)

abandoned gavias=INTEG (abandonment-permanent abandonment-newirrig-gavias restoration,GAV
ABAND INIC)

Area covered by abandoned gavias. Units: ha

abandonment=active gavias*GCR

Change on abandoned gavias. Units: ha/Year

ABROAD=0.74

Proportion of tourists arrived from abroad (Source: ISTAC). Units: Dmnl

acomodation ch=IF THEN ELSE(ch or>0:AND:or-1>THRESHOLD OR, tourist accommodation capacity
*AIR*rem new accomod, 0)

Change in the number of bed in tourist accommodation. Units: bed/Year

acomodation effect=maturity factor*potential accomodat effect

The effect that the new accommodations have on the Fuerteventura attraction factor. Units: Dmnl

active crops=irrigation+active gavias

Area covered by the total active crops. Units: ha

active gav prop=active gavias/MAX GAVIAS

Active gavias proportion. Units: Dmnl

active gavias=INTEG (gavias restoration-abandonment, INIT GAVIAS)

Area covered by active gavias. Units: ha

adjustable runoff=ARC*runoff

Adjustable runoff. Units: m3/Year

AIR=0.18988

Accomodation increase ratio (Source: AC). Units: 1/Year

annual vol gav reuse=reus vol-irrigation reus vol

Annual volumen of reclaimed water for gavias restoration. Units: m3/Year

ARC=0.367

Adjustable runoff constant. Units: Dmnl

artificial land percentage=((artificial land/FV area ha)*100)

Proportion of modified land. Threshold: 20% sustainability (Graymore et al. 2010). Units: Dmnl

artificial land=roads area+tracks area+nonhoteland+hoteland+golf courses+residential+irrigation

Artificial (modified) land. Units: ha

at landscape indicator=(nat high quality calidad+active gavias)/artificial land

Atraccion landscape indicator. Units: Dmnl

available surface water=surface discharge-EVAPORATION+irrigation reus vol

Available surface water. Units: m3/Year

AVERGOODS=1.22027e+009

Average value of the Sea transportation of goods (kg) (Source: ISTAC). Units: kg/Year

AVERSTAY=9.06

Average lenght of the stay (Source: INE). Units: days

B=33.2455

Intercept from regression between births and GDPca. Units: Dmnl

beach m2 2015=beach*scn spill
Beach surface available after 2010. Units: m2

beach m2=IF THEN ELSE(Time<2015,beach,beach m2 2015)
Beach area. Units: m2

beach pc factor=lookup beach pc(i beach pc)
Units: Dmnl

beach pc=beach m2/total population
Available beach per capita. Units: m2/inhab

beach=6.51589e+006
Available beach area (litoral strip of 100m). Units: m2

BIR BASE=-0.018767
Factor from regression between births and GDPca. Units: 1/Year

bir=exp time*GDPca NORMALIZED
Birth rate. Units: 1/Year

births=resident population*bir
Births. Units: inhab/Year

bov demand=n bov*TCONPORC
Water demand by by bovine cattle. Before AS demanda bov=(n bov*TCONBOV). Units: m3/Year

bov rate=-6.83
Change on the number of cows rate. Units: head/Year

bov2012=INTEG (bov rate, 209)
Number of cows after 2012 (for scenarios).Units: head

brine production=(1-SEADES CONVR)*(urban desal demand/SEADES CONVR)
Brine production. Units: m3/Year

built urban=residential+hoteland+nonhoteland+golf courses
Urban built up area. Units: ha

CFBUEU=3.37
Factor of urban built up which affects the houbara habitat. Units: Dmnl

CGc=goat and sheep cattle*Lug
Goat and sheep cattle (expresed as LU). Units: LU

CGcpast=MAX((CGc-potential stocking rate reduction)*NGP,0)
Grazing goat and sheep cattle. Units: LU

CGcpast1=DELAY FIXED (CGcpast, 1, 5120)
Delayed grazing goat and sheep cattle. Units: LU

cgfodproduction=pasture and fodder production/TINGCAPROV
Stocking rate capacity in gavias. Units: head

cgpastac=CGcpast*fac
Goat and sheep cattle which graze in the high quality natural vegetation proportion of the grazeable area. Units: LU

ch aband gavias=abandonment-newirrig-gavias restoration-permanent abandonment

Change on abandoned gavias. Units: ha/Year

ch employ=(tourist employment-delayed employment)/delayed employment

Annual change on the employment. Units: Dmnl

ch hab sec gav=HCRac*ch aband gavias

Change on the secondary habitat due to changes on the abandoned gavias. Units: ha/Year

ch or=or-1-or-2

Change on the occupancy rate between last year and the previous one. Units: inhab/bed

change HS=loss HSHtracks+loss HSHroads+loss HSHbu+ch hab sec gav-chHSpermabandon

Change on the secondary habitat. Units: ha/Year

change in desalinated water SCNfod=(MAX(total water needs-water total crop,0))*TEXTIT

Change on water which will be deslated each year. Units: m3/Year/Year

change nonhot=nonhotel accommodation-delayed nonhot

Change in non hotel accomodations. Units: bed/Year

chGDPca=INTEG (GDPca rate,0)

Change on the GDPca. Units: Dmnl

chHPHpermabandon=HPH prop*HCRpermabandon*permanent abandonment

Houbara Primary Habitat gainance due to the new natural schrub after the permanent abondement. Units: ha/Year

CLIM=0

Climate change scenario activator. Units: Dmnl

CO2 balance=CO2 emission vehicles fleet+CO2 visitors+CO2 ships+CO2balance gavias+CO2balance golf+CO2balance irrigation+CO2balance natural vegetation+Indirect emission of generated waste+Indirect emissions of electricity consumption

Total balance of CO2 in Fuerteventura island. Units: g CO2/Year

CO2 emission vehicles fleet=(demand E transport*DVEF)+(demand E transport*GVEF)

CO2 emissions from vehichles fleet. Units: g CO2/Year

CO2 per capita=CO2 balance/total population

Per capita CO2 emissions. Units: g CO2/(Year*inhab)

CO2 ships=SCO2E*SFCF desglosado*ships

CO2 emissions from ships. Units: g CO2/Year

CO2 transport=CO2 visitors+CO2 ships+CO2 emission vehicles fleet

CO2 from Transport sector. Units: g CO2/Year

CO2 visitors=FCO2E*energy used flights

CO2 emissions related to the energy consumed on flights. Units: g CO2/Year

CO2balance gavias=CO2FACTORGav*(active gavias+(fodder scn area*FPgav))

CO2 factor for gavias. Units: g CO2/Year

CO2balance golf=CO2FACTORGc*golf courses

CO2 factor for golf courses. Units: g CO2/Year

CO2balance irrigation=CO2FACTORirrig*(irrigation+(fp irrig*fodder scn area))

CO2 factor for irrigated areas. Units: g CO2/Year

CO2balance natural vegetation=natural total*NEEevolution

Balance (flow) CO2 emission-sequestration from natural vegetation. Units: g CO2/Year

CO2FACTORgav=300000

CO2 factor for gavias. Units: g CO₂/(Year*ha)

CO2FACTORgc=6.46e+006

CO2 factor for golf courses. (Source: Muñoz-Rojas et al. 2011). Units: g CO₂/(Year*ha)

CO2FACTORirrig=5e+006

CO2 factor for irrigation. (Source: derived from Muñoz-Rojas et al. 2011). Units: gCO₂/(Year*ha)

CPRE=0.0008224

Rainfall coefficient. Units: LU/(ha*mm)

DAYS A YEAR=365

Units: days/Year

deaths=MOR*resident population

Death rate. Units: inhab/Year

deficit hq=IF THEN ELSE(hq area required- nat high quality >0, hq area required- natl high quality vegetation, 0)

Deficit of hectares of high quality natural vegetation required by the grazing needs. Units: ha

degra nthq proportion=degradation hq notrans/(nat hq notrans*OVERGRAZING RATIO)

Degradation of the non transformable high quality natural vegetation proportion. Units: Dmnl

degra thq proportion=degradation hq trans/(nat hq trans*OVERGRAZING RATIO)

Degradation of the transformable high quality natural vegetation proportion. Units: Dmnl

degradation hq notrans=MIN(nthq prop*p deficit hq*OVERGRAZING RATIO,nat hq notrans*OVERGRAZING RATIO)

Degradation of the non transformable high quality natural vegetation caused by overgrazing.

Units: ha/Year

degradation hq trans=MIN(thq prop*p deficit hq*OVERGRAZING RATIO,nat hq trans*OVERGRAZING RATIO)

Degradation of the transformable high quality natural vegetation caused by overgrazing. Units:

ha/Year

delay beach pc facto=DELAY FIXED (beach pc factor, 1, 1)

Units: Dmnl

delayed employment=DELAY FIXED (tourist employment, 1, REFERENCE EMPLOYMENT)

Units: emp

delayed nonhot=DELAY FIXED (nonhotel accommodation,1,24836.5)

Non hotel accommodation delayed. Units: bed/Year

demand E des=(IF THEN ELSE(Time<2010, TKWM3*urban desal demand , TKWM3*(urban desal demand-desal CORRALEJO)))+requiered energy fodder scn

Electric energy demand for desalination processess. Units: kwh/Year

demand E etp=etp*ecr

Demand of electric energy from the tourist equivalent population. Units: kwh/Year

demand E others=TCEO*pri pop and transp

Demand of electric energy from other sectors. Units: kwh/Year

demand E respop=resident population*ecr

Demand of electric energy from the resident population. Units: kwh/Year

demand E transport=vehicles fleet*TCV

Demand of energy from transportation (by roads). Units: kwh/Year

demand nonel etp=etp*TCNE

Demand of non electric energy from tourist equivalent population. Units:kwh/Year

demand nonel others=TCEOne*pri pop and transp

Demand of non electric energy from other sectors. Units: kwh/Year

demand nonel respop=resident population*TCNE

Demand of non electric energy from resident population. Units: kwh/Year

desal CORRALEJO=1.46e+006

Capacity of the desalination facilities in Corralejo. Units: m3/Year

DVEF=189.6

Diesel vehicles CO2 emission factor. Units: g CO2/kwh

DIST1=316.14

Distance from Gran Canaria by passenger's flights (round trip). Units: km/inhab

DIST2=3234.26

Distance from Madrid by passenger's flights (round trip). Units: km/inhab

DIST3G=6973.66

Distance from Berlin by passenger's flights (round trip). Units: km/inhab

DIST3UK=5604.92

Distance from London to by passenger's flights (round trip). Units: km/inhab

DIST4=2291.12

Distance from Puerto de Cádiz to Puerto del Rosario (round trip). Units: km/journey

DOTRPAST=11000

Fodder water requirements. Units: m3/(Year*ha)

ECCG= (LGCC-Egyptian vultures)/LGCC

Egyptian vulture carrying capacity. Units: Dmnl

ECO2E=360

Electricity CO2 Emission factor. Units: g CO2/kwh

EECBR=829.495

Population electric energy consumption base ratio, before considering the GDPca effect. Units: kwh/(inhab*Year)

eeecr=effect chGDPca*EECBR

Population electric energy consumption Ratio (once the effect of GDPca has been considered). Units: kwh/(inhab*Year)

efec clim=0.9

Coefficient of rainfall for Climate change scenarios. Units: Dmnl

effect reut=(MIN(fodder scn area,potential new active gavias))*TREUG

Effect of the reclaimed water for gavias restoration. Units: ha/Year

effect chGDPca=initial factor evoGDP+chGDPca

Effect of the change on GDPca on energy consumption. Units: Dmnl

effect new built up urb=CFBUEU*new built urban

Effect of the new built up urban on the houbara habitat. Units: ha/Year

effective urban desalinated seawater consumption=MIN(SEADESCAP, urban desal demand
Effective urban desalinated seawater consumption. Removed from the model structure after the
OAT. Units: m3/Year

EFLGCC=CGcpast1*Elgcc
Effect of the livestock on the Egyptian vulture carrying capacity. Units: ev

Egyptian vult prop=Egyptian vultures/REF Egyptian vult
Proportion of Egyptian vultures regarding the reference value. Units: Dmnl

Egyptian vultures=INTEG (inc ev-nonat death Ev, 113)
Egyptian vultures population. Units: ev

EICF=2
Energy intensity conversion factor. Units: MJ/km

elec E consum=IF THEN ELSE(SAwr=0, demand E des+demand E others+demand E respop+demand E
etp, demand E others+demand E respop+demand E etp)
Total electric energy consumption. Units: kwh/Year

eLGCC=0.0215197
Effect of the livestock over the carrying capacity of the Egyptian vulture (AC). Units: ev/LU

emigration=(resident population*temig)
Emigration rate. Units: inhab/Year

employ index=employ ratio*(NORMAL EMPLOY FACTOR+ch employ)
Employment index. Units: Dmnl

employ ratio=(delayed employment/REFERENCE EMPLOYMENT)
Units: Dmnl

energy losses=IF THEN ELSE(SAef=0, TPPbase, TPPbase+RAMP TPP)
Energy losses for scenarios. Units: Dmnl

energy self sufficient index=(tot prim energy-tot pri no renewab)/tot prim energy
Energy self sufficient index. Units: Dmnl

energy used flights=(DIST1*vis1) + (DIST2*vis2) + (DIST3G*vis3*ratioG) + (DIST3UK*vis3*ratioUK))*EICF
Energy use per passenger (one way flights). Units: MJ/Year

etp=iet*INITIAL ETP
Tourist equivalent population. Units: inhab

EVAPORATION=67000
Annual evaporation rate from water reservoirs. Units: m3/Year

EVTo=(EVTp*pre vol m2)
Evapotranspiration. Units: m/Year

EVTp=0.315
Evapotranspiration (after the improvement of model formulation by means of the SA, the model
value is 0.315; before this change, the model value was 0.9). Units: Dmnl

exp time=EXP(B+(BIR BASE*Time))
Units: Dmnl/Year

fac=nat high quality / grazeable area
High quality natural proportion on the total grazeable area. Units: Dmnl

FC pre=0.001

Unit conversor. Units: m/(mm*Year)

FCO2E=69

Flights CO2 Emissions (Source: Becken 2002). Units: g CO2/MJ

FCONV=10000

Unit conversor. Units: m2/ha

filling rate=MIN(73684.2, (reservoir capacity*TEXT))

Annual filling ratio. Units: m3/Year

FLOWSPRINGR=4.8751e-006

Flow spring ratio. Insensitive parameters. Removing from the model structure after OAT. Units: 1/Year

fod consump bov=TINGCAPROV*n bov

Fodder consumption (and other materials) by bovine cattle. Before AS: TINGBOV*n bov. Units: kg/Year

fod consump porc=TINGCAPROV*n porc

Fodder consumption (and other materials) by pig cattle. Before AS: TINGPORC*n porc. Units: kg/Year

fod importation needs=MAX(requiered fodder caprov-fodder consumption supplied by grazing-Fodder needs grazing potential feedlot cattle feed,0)

Potential fodder importation needs. Units: kg/Year

fod need prop=fodder importation needs/(requiered fodder bovporc+requiered fodder caprov)

Proportion of fodder importation needs, regarding the total needs. Units: Dmnl

fodder consumption supplied by grazing=TINGCAPROV*(real stocking rate reduction/LUg)*NGP

Fodder consumption supplied by grazing under Measure 3.2. Units: kg/Year

fodder desalinated water supply=INTEG (change in desalinated water SCNfod,0)

Annual capacity of desalination for fodder water supply. Units: m3/Year

fodder importation needs=fod importation needs+requiered fodder bovporc

Fodder importation needs. Units: kg/Year

fodder needs grazing=(CGcpast/LUg*TINGCAPROV)

Fodder needs supplied by grazing. Units: kg/Year

fodder scn area=fod importation needs/FODDER YIELD

Area on the island needed to product all the requiered fodder. Units: ha

FODDER YIELD=37705.5

Annual fodder yield (Source: Palacios et al. 2008). Units: kg/(ha*Year)

fp irrig=1-FPgav

Irrigated fodder area proportion. Units: Dmnl

FPgav=0.4

Non irrigated fodder area proportion (average proportion of the ISTAC serie of data). Units: Dmnl

fst=delay beach pc factor*tpi factor*natural landscape indicator

Tourist attraction index. Units: Dmnl

FUEL CONSS=804.812

Fuel consumption of ships by each kilometer. Units: kg fuel/km

FV area ha=172500

Fuerteventura area (hectares). Units: ha

FV area m=1.725e+009

Fuerteventura area (m2). Units: m2

GAV ABAND INIC=3475.68

Initial value. Units: ha

gavias infiltration=IF THEN ELSE((gavias m2*IR gavias)>(gavias m2*EVTo), (gavias m2*IR gavias)-(gavias m2*EVTo),0)

Annual volume from gavias infiltration. Units: m3/Year

gavias m2=FCONV*active gavias

Unit conversor. Units: m2

gavias restoration=MIN(rehab efec,abandoned gavias*TEXTIT)

Restoration of gavias. Units: ha/Year

GCR=0.0515523

Gavias abandonment ratio (AC). Units: 1/Year

GDP effect=GDP NORMAL+GDPreal long*MFACTOR GDP

Effect of the GDP of the most important markets for outbound tourism on the tourist choice of destination index. Units: Dmnl

GDP NORMAL=1

Normalized value of GPD index. Units: Dmnl

GDP real

Annual variation of the GDP from the main markets for outbound tourism for Fuerteventura (Data). Units: Dmnl

GDP2012=0

For scenarios activation. Units: Dmnl

GDPca inmig=GDPca NORMALIZED*MF GDPca INMIG

Effect of the Canarian GDP on immigration processes. Units: Dmnl

GDPca inmig-S= DELAY1(GDPca inmig, TINMIGDPca)

Delayed effect of GDPca on inmigration. Units: Dmnl

GDPca long=IF THEN ELSE(Time<2012, GDPca, GDPca+GDPCAN2012)

Long time series of GDPca. Units: Dmnl

GDPca NORMALIZED=GDP NORMAL+GDPca long

Normalized Canarian GDP. Units: Dmnl

GDPca rate=TI GDPca*TEXTIT

Change in GDPca. Units: Dmnl/Year

GDPca

Annual variation of the Canarian GDP (Data). Units: Dmnl

GDPcaFACTOR=4240

Effect of the GDPca on sea transportation of goods. Units: ships

GDPCAN2012=0

For scenarios activation. Units: Dmnl

GDPreal long=IF THEN ELSE(Time<2012, GDP real,GDP real+GDP2012)

Long time series of GDPreal. Units: Dmnl

goat and sheep cattle

Number of heads of goat and sheep cattle until 2011 (Data). Units: head/Year

goatsh demand=goat and sheep cattle*TCONCAPROV

Water demand by by goat and sheep cattle. Units: m3/Year

goatsh2012=INTEG (goatsh rate, 149745)

Number of goats and sheeps after 2012 (for scenarios).Units: head

goatsh rate=-85.83

Change on the number of goats and sheeps rate. Units: head/Year

golf courses dem

Annual golf courses demand (Data). Units: golf course/Year

golf courses=INTEG (nat hq golf+nat lq golf,0)

Source: Aerial photointerpretation from GRAFCAM images. Units: ha

golf gross demand=golf net demand+(golf net demand*GOLFLOS R)

Gross water demand by golf courses irrigation. Units: m3/Year

golf land demand=golf courses dem*SCG

Annual golf land demand. Units: ha/Year

golf net demand=GOLFCONR*golf courses

Net water demand by golf courses irrigation. Units: m3/Year

golf reus vol=TOURISTGOLFREUR*tur treat vol

Reused sewage water volume which is destined to golf courses irrigation. Units: m3/Year

GOLFCONR=10950

Golf courses water consumption. Units: m3/(ha*Year)

GOLFLOS R=0.2

Water loss ratio on golf courses. Units: Dmnl

goods=AVERGOODS-(pasture and fodder production*SAP3)

Average value of the Sea transportation of goods (kg). Units: kg/Year

grazeable area=abandoned gavi as+natural total

Units: ha

GROUNDWATER INIT=1.035e+010

Initial value. Units: m3

groundwater=INTEG (gavi as infiltration+rainfall recharge+irrigat reinfiltrat-gw pumping-VOL FLOW SEA-vol flow spring,GROUNDWATER INIT)

Groundwater volumen. Units: m3

GVEF=95.312

Gasoline vehicles CO2 emission factor. Units: g CO2/kwh

gw pumping=gwp irrig+gwp livestock+gwp urban+gwp golf

Ground water pumping. Units: m3/Year

gwp golf=IF THEN ELSE(golf gross demand>golf reus vol,golf gross demand-golf reus vol,0)

Ground water pumping for golf courses demand. Units: m3/Year

gwp irrig=IF THEN ELSE(irrigation gross demand>available surface water,irrigation gross demand-available surface water ,0)

Groundwater pumping for irrigation demand. Units: m3/Year

gwp livestock=bov demand+goatsh demand+porc demand

Groundwater pumping for livestock demand. Units: m3/Year

gwp rpop=rpop gross demand *RPOPAQUIFR

Groundwater pumping for resident population demand. Units: m3/Year

gwp urban=gwp rpop

Groundwater pumping for urban demand. Units: m3/Year

ha roads=new roads*RATIO ha km ROADS

Roads area (in hectares). Units: ha/Year

ha tracks=new tracks*RATIO ha km TRACKS

Tracks area (in hectares). Units: ha/Year

HCRac=0.966

Houbara habitat change ratio due to active crops. Units: Dmnl

HCRpermabandon=0.178

Houbara habitat change ratio due to permanent abandonment of gaviias. Units: Dmnl

HCRroads=15.509

Houbara Habitat Change Ratio due to roads. Units: ha/km

HCRtracks=8.42

Houbara habitat change ratio due to tracks. Units: ha/km

HCRub=0.119

Houbara habitat change ratio per hectare of new urban built up. Units: Dmnl

high quality degradation=degra nthq proportion+degra thq proportion

Degradation of the total high quality natural vegetation proportion. Units: Dmnl

hm3 recharge=tot recharge/hm3

Recharge (hm3). Units: hm3/Year

hm3=1e+006

Unit conversor. Units: m3/hm3

hot land demand=MAX(0,hotel accommod demand*HOTEL ACCOMMODATION LAND DEM)

Hotel land demand. Units: ha/Year

hotel accommod demand=accommodation ch-change nonhot

Hotel accommodation demand. Units: bed/Year

HOTEL ACCOMMODATION LAND DEM=0.0059

Demand of land by each nonhotel accommodation bed (Source: Government of Canary Island 2004). Units: ha/bed

hoteland=INTEG (nat hq hot+nat lq hot,60.9612)

Units: ha

Houb Habitat prop=total houbara habitat/REF houb habitat

Houbara habitat proportion. Units: Dmnl

HPH prop=primary habitat/total houbara habitat

Proportion of the primary habitat regarding the total houbara habitat. Units: Dmnl

HPHinitial=11051

Initial value. Units: ha

HPHLRntracks=HPH prop*HCRtracks

Houbara Primary Habitat loss Ratio per km of tracks. Units: ha/km

HPHLRroads=HPH prop*HCRroads

Houbara Primary Habitat loss Ratio per km of roads. Units: ha/km

hq area required=cgpastac/stocking rate max

High quality natural vegetation area required by the grazing needs. Units: ha

HSH prop=secondary habitat/total houbara habitat

Proportion of the primary habitat regarding the total houbara habitat. Units: Dmnl

HSHinitial=19003.3

Initial value. Units: ha

HSHLRntracks=HSH prop*HCRtracks

Houbara Secondary Habitat loss Ratio per km of tracks. Units: ha/km

HSHLRroads=HCRroads*HSH prop

Houbara Secondary Habitat loss Ratio per km of roads. Units: ha/km

i beach pc=beach pc/NBEACH THRESHOLD

Beach pc Index used in order to normalized the dimmension. Units: Dmnl

ICR=0.00110302

Irrigation change rate (AC). Units: 1/Year

iet=IF THEN ELSE(Time<1997,1+RAMP(-0.201,1996,1997),fst*GDP effect*SHOCKS*accomodation effect*MFACTOR IET)

Tourist choice of destination index. Units: Dmnl

inc ev=MIR*Egyptian vultures*ECCG

Increase on the Egyptian vulture population. Units: ev/Year

inc pobres=respob delay-pobres ret-1

Change on resident population. Units: inhab

inc pop=total population-pobtot ret

Annual increase of population. Units: inhab

Indirect emission of generated waste=USW generation*WCO2E

Indirect emission of generated waste. Units: g CO2/Year

Indirect emissions of electricity consumption=Consumo E elect*ECO2E

Indirect emissions of electricity consumption. Units: g CO2/Year

INIT GAVIAS=324.318

Initial value. Units: ha

INIT IRRIG=359

Initial value. Units: ha

INIT RC=2.08421e+006

Initial reservoir capacity. Units: m3

INITIAL ETP=23735

Initial tourist equivalent population. Units: inhab

INITIAL factor evoGDP=1

Initial value. Units: Dmnl

INITIAL INMIG=7608

Initial value. Units: inhab/Year

inmigration=IF THEN ELSE(Time<1997,INITIAL INMIG, INITIAL INMIG*employ index*"GDPca inmig-S")

Immigration rate. Units: inhab/Year

IR gavias=0.2

Infiltration ratio in gavias. Units: m/Year

IR=0.062

Infiltration ratio from rainfall. Units: Dmnl

IRCONR=7000

Irrigation consumption ratio. Units: m3/(ha*Year)

IRLOSR=0.43

Irrigation loss ratio. Units: Dmnl

irrigat reinfiltrat=irrigation gross demand-irrigation net demand

Infiltration water volume from irrigation. Units: m3/Year

irrigation gross demand=irrigation net demand+(irrigation net demand*IRLOSR)

Gross demand for irrigation. Units: m3/Year

irrigation net demand=irrigation*IRCONR

Net demand for irrigation. Units: m3/Year

irrigation reus vol=reus vol*IRRIGREUSR

Reused irrigation water volume. Units: m3/Year

irrigation=INTEG (newirrig, INIT IRRIG)

Irrigated area. Units: ha

IRRIGREUSR=0

Irrigation water reused ratio. Units: Dmnl

ISLAND=0.18

Proportion of tourist arrived from other island of the Archipelago. Units: Dmnl

Kc=0.35

Cereal coefficient. Insensitive parameters. Removing from the model structure after OAT. Units: Dmnl

km2=0.01

Change of units. Units: km2

Kn=23.5334

Egyptian vulture population carrying capacity natural, without considering the livestock effect. Units: ev

kwh flights=energy used flights*UDkwh MJ

Primary energy (kwh/y) from flights. Units: kwh/Year

kwh ships=SFCEf desglosado*ships*UD kg fuel MJ*UDkwh MJ

Fuel used by ships. Units: kwh/Year

landscape indicator=(nat high quality +active gavias)/artificial land

Landscape indicator. Units: Dmnl

LGCC=EFLGCC+Kn

Increases on the Egyptian vulture carrying capacity because of the effect of livestock. Units: ev

lookup beach pc=[(0,0)-(100,1)],(0,0.1),(0.13333,0.2),(0.2,0.5),(1,1))

Source: Different scientific literature and expert (pers. com). Units: Dmnl

loss HP=loss HPHtracks+loss HPHroads+loss HPHbu-chHPHpermabandon

Change on the primary habitat. Units: ha/Year

loss HPHbu=effect new built up urb*HCRub*HPH prop

Houbara Primary Habitat Loss due to built urban. Units: ha/Year

loss HPHroads=new roads*HPHLRroads

Loss on the primary habitat due to the construction of roads. Units: ha/Year

loss HPHtracks=new tracks*HPHLRntracks

Loss on the primary habitat due to the construction of tracks. Units: ha/Year

loss HSHbu=effect new built up urb*HCRub*HSH prop

Loss on the secondary habitat due to urban areas. Units: ha/Year

loss HSHroads=new roads*HSHLRroads

Loss on the secondary habitat due to the construction of roads. Units: ha/Year

loss HSHtracks=new tracks*HSHLRntracks

Loss on the secondary habitat due to the construction of roads. Units: ha/Year

loss water rpop=rpop net demand*LOSS

Losses in water consumption by resident population. Units: m3/Year

loss water tur=tur net demand*LOSS

Losses in water consumption by tourist population. Units: m3/Year

LOSS=0.31

Loss ratio for urban water supply. Units: Dmnl

LUg=0.15

Livestock unit factor (1 goat= 0.15 LU). Units: LU/head

maturity factor=IF THEN ELSE(rem new accommod>=MATURITY THRESHOLD, MAX MATURITY FACTOR, rem new accommod/MATURITY THRESHOLD)

Maturity factor. Units: Dmnl

MATURITY THRESHOLD=0.1

Maturity threshold. For scenario simulation. Units: Dmnl

MAX ACCOMMODATION=133000

Maximum number of beds. Units: bed

MAX GAVIAS=800

Historical maximum of gavias area (Perdomo). Units: ha

MAX MATURITY FACTOR=1

Units: Dmnl

MF GDPca INMIG=1.24816

Effect of the GDPca on immigration (AC). Units: Dmnl

MFACTOR GDP=3.14604

Effect of the GDPreal on foreign tourists arrivals (AC). Units: Dmnl

MFACTOR IET=0.704086

Factor on the tourist choice index (AC). Units: Dmnl

MIR=0.609399

Maximum or intrinsic growth ratio for the Egyptian vulture (AC). Units: 1/Year

MOR=0.0036523

Mortality ratio. Units: 1/Year

n bov

Number of bovine heads until 2011 (Data). Units: head/Year

n bov2025=IF THEN ELSE(Time<2012, n bov,bov2012)

Number of cows until 2025 (for scenarios). Units: head

n goatsh2012=INTEG (goatsh rate,124373)

Number of goat after 2012 (for scenarios). Units: head

n goatsh 2025=IF THEN ELSE(Time<2012, goat and sheep cattle, n goats2012)

Number of goats and sheeps until 2025 (for scenarios). Units: head

n porc

Number of porcine heads until 2011 (Data). Units: head/Year

n porc2025=IF THEN ELSE(Time<2012, n porc, porcino2012)

Number of pigs until 2025 (for scenarios). Units: head

nat high quality=nat hq notrans+nat hq trans

Total high quality vegetation. Units: ha

nat hq golf=golf land demand*nat1

Change rate: from transformable high quality natural to golf. Units: ha/Year

nat hq hot=hot land demand*nat1

Change rate: from transformable high quality natural to hotel accommodations. Units: ha/Year

nat hq nonhot=nonhot land demand*nat1

Change rate: from transformable high quality natural to nonhotel accommodations. Units: ha/Year

nat hq notrans=INTEG (recovery nthq-degradation hq notrans,NATHQNTIN)

Area occupied by high quality vegetation (protected, so non transformable). Units: ha

nat hq prop=nat high quality /natural total

Units: Dmnl

nat hq res=res land demand*nat1

Change rate: from transformable high quality natural to residential. Units: ha/Year

nat hq roads=nat1*ha roads

Change from high quality transformable to roads rate. Units: ha/Year

nat hq tracks=ha tracks*nat1

Change from high quality transformable to tracks rate. Units: ha/Year

nat hq trans=INTEG (recovery thq-degradation hq trans-nat hq nonhot-nat hq golf-nat hq hot-nat hq res-nat hq tracks-nat hq roads,NATHQNTIN)

Area occupied by high quality vegetation (transformable, so non protected). Units: ha

nat lq golf=golf land demand***nat2**

Change rate: from transformable low quality natural to golf courses. Units: ha/Year

nat lq hot=hot land demand***nat2**

Change rate: from transformable low quality natural to hotel accommodations. Units: ha/Year

nat lq nonhot=nonhot land demand***nat2**

Change rate: from transformable low quality natural to nonhotel accommodations. Units: ha/Year

nat lq res=res land demand***nat2**

Change rate: from transformable low quality natural to residential. Units: ha/Year

nat lq roads=ha roads***nat2**

Change from low quality transformable to roads rate. Units: ha/Year

nat lq tracks=ha tracks***nat2**

Change from low quality transformable to tracks rate. Units: ha/Year

nat lq=INTEG (permanent abandonment+degradation hq notrans+degradation hq trans-**nat lq nonhot**-**nat lq golf**-**nat lq hot**-**nat lq res**-recovery nthq-recovery thq-**nat lq roads**-**nat lq tracks**,**NATLQIN**)

Area occupied by low quality vegetation (actual vegetation). Units: ha

nat1=**nat hq trans**/natural trans

Proportion of the transformable high quality natural vegetation respect to the total transformable natural vegetation. Units: Dmnl

nat2=**nat lq**/natural trans

Proportion of the low quality natural vegetation respect to the total transformable natural vegetation. Units: Dmnl

NATACIN=**NATHQNTIN**+**NATHQTIN**

Initial value. Units: ha

NATHQNTIN=11529.9

Initial value. Units: ha

NATHQTIN=4143.07

Initial value. Units: ha

NATIN=153763

Initial value of the total natural vegetation. Units: ha

NATLQIN=138089

Initial value. Units: ha

natural landscape indicator=natural total/**NATIN**

Indicator of the naturality of the landscape. Units: Dmnl

natural total=**nat high quality**+**nat lq**

Area covered by natural vegetation. Units: ha

natural trans=**nat hq trans**+**nat lq**

All the transformable natural vegetation. Units: ha

NBEACH THRESHOLD=30

Normalized beach factor threshold (PTEOTIF, 2007). Units: m2/inhab

NEEevolution=(**NEEfactor**+preFACTOR*LN(rainfall))

NEE evolution derives from a linear regresion from literature review. Units: gCO2/(Year*ha)

NEEfactor=1.13987e+007

Net ecosystem exchange factor. Units: g CO₂/(Year*ha)

net migration rate=(immigration-emigration)/(immigration+emigration)

Net migration indicator. Units: Dmnl

new built urban=nat hq nonhot+nat hq golf+nat hq hot+nat hq res+nat lq nonhot+nat lq golf+nat lq hot+nat lq res

New built up urban. Units: ha/Year

new built urban=nat hq nonhot+nat hq golf+nat hq hot+nat hq res+nat lq nonhot+nat lq golf+nat lq hot+nat lq res

New built up urban. Units: ha/Year

new roads=MAX(0, ROADSn*inc pop)

New roads demand. Units: km/Year

new tracks=MAX(0, inc pobres*TRACKSn)

New tracks demand. Units: km/Year

newirrig=abandoned gavias*ICR

Transformation of abandoned gavias into new irrigated lands. Units: ha/Year

NGP=0.5

Net grazing proportion. Units: Dmnl

no tend=0

For scenarios implementation. Units: Dmnl

nonat death Ev=real electrocution+poisoning

Non natural deaths of Egyptian vultures (poisoning and other non natural causes). Units: ev/Year

NONHOT ACCOM RATIO=0.53

Nonhotel accommodations ratio regarding the total tourist accommodation (Source: ISTAC 2012).
Units: 1/Year

nonhot land demand=MAX(0,change nonhot*NONHOTEL ACCOMMODATION LAND DEM)

Units: ha/Year

NONHOTEL ACCOMMODATION LAND DEM=0.0042

Demand of land by each nonhotel accommodation bed. Units: ha/bed

nonhotel accommodation=tourist accommodation capacity*NONHOT ACCOM RATIO

Non hotel accommodation capacity. Units: bed/Year

nonhoteland=INTEG (nat hq nonhot+nat lq nonhot, 86.9242)

Units: ha

NORMAL EMPLOY FACTOR=1

When there are no changes on the employment, the index will be the normal value. Units: Dmnl

NOTOURIST EMPLOY=0.249

Proportion of employment not linked to tourist. Insensitive parameter. Removing from the model structure after OAT. Units: Dmnl

nthq prop=nat hq notrans/nat high quality

Proportion of the non transformable high quality natural vegetation respect to the total high quality natural vegetation. Units: Dmnl

occupancy rate=etp/tourist accommodation capacity

Tourist occupancy rate. Units: inhab/bed

or-1=DELAY FIXED (occupancy rate, 1, 0.68)

Delay in the occupancy ratio. Units: inhab/bed

or-2=DELAY FIXED (occupancy rate, 2, 0.7)

Delay of 2 years in the occupancy ratio. Units: inhab/bed

overgrazing indicator=(CGcpast/ grazeable area)/stocking rate max

Overgrazing indicator. Units: Dmnl

OVERGRAZING RATIO=1

Time unit. Units: 1/Year

p deficit hq=DELAY1(deficit hq, TES)

Effect of the deficit of hectares of high quality natural vegetation required by the grazing needs in the time. Units: ha

pasture and fodder production=FODDER YIELD*productive gavias

Units: kg/Year

peg=IF THEN ELSE(PGG=1,PEGcpl,PEGspl)

Probability of electrocution. Units: 1/(km*Year)

PEGcpl=2.425e-005

Probability of electrocution with corrective measures in power lines. Units: 1/(km*Year)

PEGspl=9.7e-005

Probability of electrocution without corrective measures in power lines. Units: 1/(km*Year)

PENINSULA=0.078

Proportion of tourist arrived from the Iberian Peninsula. Units: Dmnl

permanent abandonment=abandoned gavias/ST

Permanent abandonment (from abandoned gavias). Units: ha/Year

pg reus vol=tur treat vol-golf reus vol

Reuse water volumen destined to irrigation of parks and gardens. Units: m3/Year

PGG=STEP(1, 2006)

Corrective measures plan against electrocution. Units: Dmnl

Photovoltaic energy

Data. Units: kwh/Year

pig rate=344.5

Change on the number of pigs rate. Units: head/Year

pimary E others=demand E others*energy losses

Primary energy demand from other sectors. Units: kwh/Year

plan rehab

Rehabilitation Plan (Data). Units: ha/Year

pli=resident population*PLRpc

Length of power lines. Units: km

PLRpc=0.00335

Power lines Ratio per capita. Units: km/inhab

pobres ret-1=DELAY FIXED (resp delay, 1, 41477)

Delayed resident population (in 1994). Units: inhab

POBRESINIT=42938

Initial value. Units: inhab

poisoning

Egyptian vultures deaths caused by poisoning (Data). Units: ev/Year

pop density=total population/FV area ha

Population density indicator. Units: inhab/ha

porc demand=n porc*TCONPORC

Water demand by by porcine cattle. Units: m3/Year

porcine2012=INTEG (pig rate, 6636)

Number of pigs after 2012 (for scenarios).Units: head

pot emigration=(resident population*TEXTIT)*NOTOURIST EMPLOY

Potential emigration. Units: inhab/Year

potential accomodat effect=tourist accommodation capacity/REFERENCE ACCOMMOD

Units: Dmnl

potential electrocution=peg*pli*Egyptian vultures

Number of potential Egyptian vultures died by electrocution. Units: ev/Year

potential feedlot cattle feed=MAX(pasture and fodder production-fodder consumption supplied by grazing,0)

Potential feedlot cattle feeding. Units: kg/Year

potential new active gavias=IF THEN ELSE(productive gavias<active gavias, 0, MAX(riegavmax-active gavias,0))

Potential restored gavias. Units: ha

potential stocking rate reduction=IF THEN ELSE(SAp32=0, 0, cgfodproduction*LUg)

Potential stocking rate reduction thanks to measures implementation. Units: LU

pre mm

Rainfall (mm). Data. Units: mm

pre vol m2=FC pre*rainfall

Rainfall (m2). Units: m/Year

pre vol=pre vol m2*FV sur m

Annual rainfall (m3/year). Units: m3/Year

pre2011=pre mm

Rainfall until 2011. Units: mm

pre2012=IF THEN ELSE(CLIM=0, pre mm, pre mm*efec clim)

Rainfall after 2011 (for scenarios). Units: mm

preFACTOR=-2.25604e+006

Rainfall factor on the NEE. Units: (g CO2)/(Year*ha*mm)

pri energy navegation=(kwh flights+kwh ships)*TPP

Primary energy from navegation (flights and ships). Units: kwh/Year

pri energy transport=demand E transport*TPP

Primary energy from transportation (by road). Units: kwh/Year

pri nonel etp=demand nonel etp*TPP

Primary non electric energy from tourist equivalent population. Units: kwh/Year

pri nonel others=demand nonel others*TPP

Primary non electric energy from tourist equivalent population. Units: kwh/Year

pri nonel respop=demand nonel respop*TPP

Primary non electric energy from resident population. Units: kwh/Year

pri pop and transp=pri tot population+pri energy transport

Total primary energy from the population and transportation. Units: kwh/Year

pri tot others=primary E others+pri nonel others

Total primary energy from other sectors. Units: kwh/Year

pri tot population=primary E respop+pri nonel respop+primary E etp+pri nonel etp

Total primary energy from the population. Units: kwh/Year

primary E desalation=demand E des*energy losses

Primary energy demand for desalination processes. Units: kwh/Year

primary E etp=demand E etp*energy losses

Primary energy from tourist equivalent population. Units: kwh/Year

primary E respop=demand E respop*energy losses

Primary energy from resident population. Units: kwh/Year

primary habitat=INTEG (-loss HP, HPHinicial)

Primary habitat of the houbara. Units: ha

productive gavias=MIN(active gavias,riegavmax)

Productive gavias. Units: ha

ptotFACTOR=0.0003261

Effect of the total population on the ship navigation. Units: ships/inhab

rainfall recharge=pre vol*IR

Groundwater recharge from rainfall. Units: m3/Year

rainfall=IF THEN ELSE(Time<2012, pre2011,pre2012)

Rainfall (long serie). Units: mm

Ratio between tourist accommodation and resident population=(tourist accommodation capacity/resident population)*100

Ratio between tourist accommodation and resident population. Units: bed/inhab

RATIO ha km ROADS=1

Roads width (10 m). Units: ha/km

RATIO ha km TRACKS=0.4

Tracks width (4 m). Units: ha/km

ratioG=0.61

Proportion of German tourist from the total foreing tourists arrived to Fuerteventura. Units:

Dmnl

ratioUK=0.38

Proportion of German tourist from the total foreing tourists arrived to Fuerteventura. Units:

Dmnl

real electrocution=potential electrocution+RANDOM NORMAL(0,6, 0, 1,7)

Number of real Egyptian vultures died by electrocution. Units: ev/Year

real stocking rate reduction=MIN(CGc,potential stocking rate reduction)

Real stocking rate reduction. Units: LU

recovery nthq=(nat lq/RT)*nthq prop

Recovery rate to non transformable high quality natural vegetation. Units: ha/Year

recovery thq=(nat lq/RT)*thq prop

Recovery rate to transformable high quality natural vegetation. Units: ha/Year

recup gavia reu=0

For scenarios implementation. Units: Dmnl

recycled waste=waste mixed*TRECRES

Extracted wastes from the mix to be recycled. Units: kg/Year

reduction of grazing=potential stocking rate reduction/LUg*TINGCAPROV

Reduction of consumption removed of the grazing. Units: kg/Year

REF Egyptian vult=190

Reference value in 2009 (Source: Mallo and Díez 2010). Units: ev

REF houb habitat=29633

Reference data (2002). Units: ha

REFERENCE ACCOMMOD=30379

Reference value (in this case, the initial value). Units: bed

REFERENCE EMPLOYMENT=8549

Reference value. Units: emp

rehab efec=IF THEN ELSE(Time<2011,plan rehab, rehab2011)

Rehabilitation effect. Units: ha/Year

rehab2011=SAgr*efect reut

Gavias rehabilitation from 2011, for scenarios implementation. Units: ha/Year

rem new accomod=(MAX ACCOMMODATION-tourist accommodation capacity)/(MAX ACCOMMODATION)

Remanents new accommodation beds. Units: Dmnl

renewable E production=IF THEN ELSE(SAwr=0,TI Eeolica+Photovoltaic energy+Thermal energy, Wind energy+Photovoltaic energy+Thermal energy+demand E des)

Renewable energy production. Units: kwh/Year

requiered energy fodder scn=fodder desalinated water supply*TKWM3

Requiered energy to supply the desalinated water demand for fodder scenario. Units: kwh/Year

requiered fodder bovporc=fod consump porc+fod consump bov

Total requiered fodder for cattle herd (cow+ pig). Units: kg/Year

requiered fodder caprov=TINGCAPROV*goat and sheep cattle

Fodder consumption (and other materials) by goat and sheep cattle. Units: kg/Year

RErpop=RAMP(-0.31, 2012, 2025)

For scenario analysis. Recession efect on water consumption of resident population (the proportion of decrease between 2008-2011). Units: m3/(Year*inhab)

res land demand=MAX(inc pobres*TSUCVOPc, 0)

Residential and other uses land demand. Units: ha/Year

reservoir capacity=INTEG (-filling rate,INIT RC)

Reservoir capacity. Units: m3

resident population=INTEG (immigration+births-deaths-emigration, POBRESINIT)

Units: inhab

residential=INTEG (nat hq res+nat lq res,2465.33)

Area occupied by residential uses. Units: ha

respop delay=DELAY FIXED (resident population,1,42882)

Resident population one year delayed (in 1995: 42882 inhabitants). Units: inhab

respop treat vol=RPTREATMENTP*rpopp sewage vol

Treated water from resident population sewage water. Units: m3/Year

reus vol=REUSR*respopp treat vol

Volume of reusing urban reclaimed water. Units: m3/Year

REUSR=0.35

Ratio of reusing urban reclaimed water. Units: Dmnl

riegavmax=water total crop/DOTRPAST

Maximun active gavias area that we can irrigate with the available water. Units: ha

road network density=(roads/(FV sur ha*km2))

Road network density. Units: km/km2

roads area= INTEG (nat hq roads+nat lq roads,ROADSin)

Area occupied by roads. Units: ha

roads=(roads area)/RATIO ha km ROADS

Length of roads. Units: km

ROADSin=423.205

Initial value. Units: ha

ROADSn=0.000358

New roads demand ratio. Units: km/inhab/Year

rpopp desal demand=rpopp gross demand*RPOP DESAL DEM

Desalinated water demand by resident population. Units: m3/Year

rpopp desal gw ratio=TOT DEMAND-RPOPAQUIFR

Residential population desalinated water demand ratio. Units: Dmnl

rpopp gross demand=loss water rpop+rpopp net demand

Gross water demand by resident population. Units: m3/Year

rpopp net demand=resident population*rpoppconr

Net water demand by resident population. Units: m3/Year

rpopp sewage vol=rpopp net demand*RPSEWAGEPROP

Residential population sewage water volume. Units: m3/Year

RPOPAQUIFR=0.01

Popula tion Water demand from the aquifer (ratio). Units: Dmnl

rpoppconr= IF THEN ELSE(SAer=0, RPOPCONRbase,RPOPCONRbase+RErpop)

Residential population water consumption. Units: m3/(inhab*Year)

RPOPCONRbase=65.7

Residential population water consumption ratio. Units: m3/(Year*inhab)

RPSEWAGEPROP=0.6

Sewage proportion. Units: Dmnl

RPTREATMENTP=0.91

Treatment water proportion from resident population. Units: Dmnl

RT=136.754

Average time of plant composition recovery. Units: Year

runoff=RUNOFFcte*pre vol

Annual runoff volume. Units: m3/Year

RUNOFFcte=0.026

Runoff factor. Units: Dmnl

SAer=0

Scenario activator (economic recession). Units: Dmnl

SAfod=0

Scenario fodder production on the island activator. Units: Dmnl

SAgr=0

Scenario gavias reuse activator. Units: Dmnl

SAp3=IF THEN ELSE(SAfod=1, SAfod, SAg)

Scenario Activator for measure M.3. Units: Dmnl

SAp32=0

Scenario activator for Measure 3.2. Units: Dmnl

SAwr=0

Scenario Activator: renewable production of desalinated water. Units: Dmnl

SCG=44

Area occupied by each golf course. Units: ha/golf course

scn spill=1-spill*STEP(1,2015)+spill*0.1111*RAMP(0.1, 2018,2025)

Units: Dmnl

SCO2E=3200

Ships CO2 Emission Factor. Units: g CO2/kg fuel

SEADES CONVR=0.45

Seawater desalination conversion ratio (Source: Meerganz von Medeazza et al. 2007; Pérez-González et al. 2012). Units: Dmnl

SEADESCAP=2.757e+007

Seawater desalination capacity. Insensitive parameters. Removed from the model structure after OAT. Units: m3/Year

secondary habitat=INTEG (-change HS, HSHinicial)

Secondary habitat of the houbara. Units: ha

selective waste collection=total population*TRECSELEC

Selective collection of the urban solid waste. Units: kg/Year

SEWAGE PROP TUR=0.57

Proportion of sewage water from tourist consumption (Source: CIAGC 2011). Units: Dmnl

SFACTOR=691.1

Ships factor. Intercept ships. By linear regression. Units: ships

SFCF desglosado=FUEL CONSs*DIST4*(goods/shipCAPACITY)

Units: kg fuel/(Year*ships)

share of renewable energy=energy self sufficient index*100

Share of renewable energy. Units: Dmnl

shipCAPACITY=2.56617e+009

Carrying capacity at 55% of the GT. Units: kg/ships

ships=SFACTOR+GDPcaFACTOR*GDPca long+ptotFACTOR*total population

Units: ships

SHOCK ARAB SPRING=RAMP(0.11, 2010 , 2011)+RAMP(-0.0367, 2011, 2014)

Arab Spring effect (Canalis 2013). Units: Dmnl

SHOCK NORMAL=1

Normalised shock. Units: Dmnl

SHOCKS=SHOCK NORMAL+SHOCK ARAB SPRING

Benchmarks. Units: Dmnl

spill=0

For future scenarios of a spill. Units: Dmnl

ST=79

Period of succession after the abandonment of agricultural areas. Units: Year

stocking rate max=CPRE*rainfall

Maximum stocking rate capacity. Units: LU/ha

surface discharge=IF THEN ELSE((surface water*TEXTIT)<irrigation gross demand, (surface water*TEXTIT), irrigation gross demand)

Surface discharge. Units: m3/Year

surface recharge=IF THEN ELSE(adjustable runoff<(reservoir capacity*TEXTIT), adjustable runoff, (reservoir capacity*TEXTIT))

Surface recharge. Units: m3/Year

SURFACE WATER INIT=2.6e+006

Initial value. Units: m3

surface water=INTEG (surface recharge-surface discharge,SURFACE WATER INIT)

Surface water volume. Units: m3

TCEO=0.254

Electric energy consumption ratio by other sectors. Units: Dmnl

TCEOne=0.27

Non electric energy consumption ratio by other sectors. Units: Dmnl

TCNE=333.302

Non electric consumption ratio by resident population. Units: kwh/(inhab*Year)

TCONBOV=17.3

Water consumption by each head of livestock (cows). Insensitive parameters. Removing from the model structure after OAT. Units: m3/head

TCONCAPROV=1.825

Water consumption by each head of livestock (goats and sheeps). Units: m3/head
TCONPORC=2.87

Water consumption by each head of livestock (pigs). Units: m3/head
TCV=13816.1

Annual energy consumption ratio by each car. Units: kwh/(car*Year)
TEMIG BASE=0.084

Base emigration ratio. Units: 1/Year
temig=TEMIG BASE/employ index
Units: 1/Year

TER=0.36+RAMP(-0.06, 2009, 2010)
Touristic employment ratio.Units: emp/inhab

TES=6.40479
Time to detect the overgrazing effects (AC). Units: Year

TEXTIT=1
Unit conversor. Units: 1/Year

TGEREURBpc=589.28
Urban waste generation per capita. Units: kg/(inhab*Year)

Thermal energy
Data. Units: kwh/Year

thq prop=nat hq trans/ nat high quality
Proportion of the transformable high quality natural vegetation respect to the total high quality natural vegetation. Units: Dmnl

THRESHOLD OR=0.530499
Profitability threshold for the occupancy rate.Units: inhab/bed

TINGBOV=16607.5
Fodder consumption by each head of livestock (cows). Insensitive parameters. Removing from the model structure after OAT. Units: kg/(head*Year)

TINGCAPROV=657
Fodder consumption by each head of livestock (goats and sheeps). Units: kg/(head*Year)

TINGPORC=1124.2
Fodder consumption by each head of livestock (pigs). Insensitive parameters. Removing from the model structure after OAT. Units: kg/(head*Year)

TINMIGDPca=2
Time of the effect of the GDPca on the inmigration (AC).Units: Year

TKWM3=4.5
Energy consumption for desalation. Units: kwh/m3

TKWM3=4.5
Energy consumption for desalation. Units: kwh/m3

tmot=effect chGDPca*TMOTN
Motorization index. Units: car/inhab

TMOTN=0.421658
Motorization index base (AC). Units: car/inhab

TOT DEMAND=1

Total water demand. Units: Dmnl

tot pri no renewab=tot prim energy-renewable E production

Total primary non renewable energy. Units: kwh/Year

tot prim energy=pri tot others+pri tot population+pri energy transport+primary E desalation+pri energy navigation

Total primary energy demand. Units: kwh/Year

tot recharge=gavias infiltration+irrigat reinfiltrat+rainfall recharge

The average recharge. Units: m3/Year

tot reus vol=golf reus vol+reus vol+pg reus vol

Total volume of reusing urban reclaimed water. Units: m3/Year

tot sewage vol=tur treat vol+respop treat vol

Total population sewage water volume. Units: m3/Year

total houbara habitat=primary habitat+secondary habitat

Total habitat of the houbara. Units: ha

total population=resident population+etp

Units: inhab

total water needs=DOTRPAST*SAfod*(fodder scn area+productive gavias)

Total water needs. Units: m3/Year

totEpri pc=tot prim energy/total population

Total primary energy per capita. Units: kwh/(Year*inhab)

tourist accommodation capacity=INTEG (accomodation ch,REFERENCE ACCOMOD)

Tourist accomodation capacity.Units: bed

tourist employment=etp*TER

Tourist employment.Units: emp

tourist price index

Tourist price index (Data). Units: Dmnl

TOURISTGOLFREUR=RAMP(0.6, 2002, 2003)

Reusing ratio of tourist recalimed water on golf courses. Units: Dmnl

tpi factor=tpi NORMAL-TPI long

Tourist prices index factor. Units: Dmnl

TPI long=IF THEN ELSE(Time<2012, tourist price index,tourist price index+TPI2012)

Long time series of TPI. Units: Dmnl

tpi NORMAL=1

Normalized tourist price index. Units: Dmnl

TPI2012=0

For scenarios activation. Units: Dmnl

TPP=1

Non electric energy loss ratio (from primary energy to final energy (Source: Government of Canary Islands 2006). Units: Dmnl

TRACKin=471.96

Initial value. Units: ha

tracks area=INTEG (nat hq tracks+nat lq tracks,TRACKin)

Area occupied by tracks. Units: ha

tracks=(tracks area)/RATIO ha km TRACKS

Length of tracks. Units: km

TRACKSn=0.001719

New tracks demand ratio. Units: km/(Year*inhab)

treated sewage proportion=tot sewage vol/urb sewage vol

Treated sewage proportion. Units: Dmnl

TRECRES=0.07

Recycled waste ratio from the mixture of waste. Units: Dmnl

TRECSELEC=49.57

Selective urban solid wastes collection ratio. Units: kg/(Year*inhab)

TREUG=0.2

Annual ratio for gaviás recuperation. Units: 1/Year

TSUCVOp_c=0.0743173

Built Urban and other uses per house ratio (AC). Units: ha/(inhab*Year)

tur gross demand=loss water tur+tur net demand

Gross water demand by tourist population. Units: m3/Year

tur net demand=etp*TURCONR

Net water demand by tourist population. Units: m3/Year

tur sewage vol=tur net demand*SEWAGE PROP TUR

Tourist sewage water volume. Units: m3/Year

tur treat vol=tur sewage vol*TUR TREAT

Treated water from tourist population sewage water. Units: m3/Year

TUR TREAT=1

Tourist water retreat ratio. Units: Dmnl

TURCONR=126.02

Tourist water consumption ratio. Units: m3/(inhab*Year)

tures=etp/resident population

Ratio of tourists to residents. Units: Dmnl

UD kg fuel MJ=40.5

Units change. Units: MJ/kg fuel

UDkwh MJ=0.277

Units change. Units: kwh/MJ

urb sewage vol=tur sewage vol+rpop sewage vol

Urban sewage water volume. Units: m3/Year

urban desal demand=rpop desal demand+tur gross demand

Urban desalination water demand. Units: m3/Year

urban gross demand=rpop gross demand+tur gross demand

Gross water demand by the population. Units: m3/Year

USW generation=total population*TGEREURBpc

Urban solid waste generation. Units: kg/Year

vehicles fleet=total population*tmot

Vehicles fleet. Units: car

vis1=ISLAND*visitors

Passengers arrived from other islands of the Canarian Archipelago. Units: inhab/Year

vis2=PENINSULA*visitors

Passengers arrived from the Iberian Peninsula. Units: inhab/Year

vis3=ABROAD*visitors

Passengers arrived from foreing countries. Units: inhab/Year

visitors=(etp/AVERSTAY)*DAYS A YEAR

Number of visitors arrived to Fuerteventura Island. Units: inhab/Year

VOL FLOW SEA=9e+006

Volume flowing into sea. Units: m3/Year

vol flow spring=50457.6

Volume flowing through spring. Before SA= groundwater*FLOWSPRINGR. Units: m3/Year

vol max reu=active gavias*DOTRPAST

Potential water volumen requiered by gavias. Units: m3/Year

waste managed in landfills=waste mixed-recycled waste

Units: kg/Year

waste mixed=USW generation-selective waste collection

Units: kg/Year

water total crop=(MAX(0,fodder desalinated water supply))+annual vol gav reuse

Total volumen of water requiered by active gavias. Units: m3/Year

WCO2E=2200

Waste CO2 Emission factor (Source: Castellani and Sala 2013). Units: g CO2/kg

Wind power

Data. Units: kwh/Year