

**Table S5.** Contribution margin analysis and net farm incomes from operations, medium-scale individual farm.

Medium-scale farm						
<b>Revenues</b>						
<i>Cash revenue</i>	Number of traded livestock (head)	Weight of meat (kg head <sup>-1</sup> )	Selling price (USD kg <sup>-1</sup> )	Selling price (USD head <sup>-1</sup> )	Sum (USD yr <sup>-1</sup> )	
Sale of beef	7	159	4,4		4.897	share of total
Sale of goat (head)	17			92,4	1.571	revenues
Sale of sheep (head)	20			158,4	3.168	(%)
				<b>Sum of cash revenues</b>	<b>9.636</b>	57,3
<i>Value of own consumption</i>	Number of consumed livestock (head yr <sup>-1</sup> )	Weight of meat (kg head <sup>-1</sup> )	Selling price (USD kg <sup>-1</sup> )	Selling price (USD head <sup>-1</sup> )		
Consumption of beef	3	165	5,1		2.525	share of total
Consumption of goat meat	15			92,4	1.386	revenues
Consumption of sheep meat	8			158,4	1.267	(%)
				<b>Sum of value of own consumption</b>	<b>5.178</b>	30,8
<i>Inventory changes</i>	Herd size at end of the year (head)	Additional cow calves (head)		Selling price (USD head <sup>-1</sup> )		share of total revenues (%)
Cattle	61	4		502	2.008	11,9
				<b>Total revenues</b>	<b>16.822</b>	100

Variable costs independent of water inflow						
<i>Veterinary</i>	Ear tags per head	Number of reared livestock (head)	Total number of ear tags (piece)	Price per ear tag (USD)	Sum (USD yr <sup>-1</sup> )	
Calve		2	14	28	0,8	22
Kids		1	32	32	0,8	26
Lambs		1	28	28	0,8	22
Sum of veterinary costs					70	
<i>Transport for beef trading</i>	Trips per year	Average diesel consumption (L)	Annual diesel consumption (L yr <sup>-1</sup> )	Diesel price (USD L <sup>-1</sup> )		
		2	98	196	0,5	98
Sum of variable costs independent of water inflow					168	
Variable costs depending on water inflow						
<i>Demand winter fodder (hay)</i>	Amount of hay (kg d <sup>-1</sup> per head)	Livestock number (head)	Feeding period (d)	Annual amount (kg yr <sup>-1</sup> )	Total demand (kg yr <sup>-1</sup> )	
Cattle	10	57	148	84360	123.728	
Goat	2	67	148	19832		
Sheep	2	57	148	16872		
Workhorses	9	2	148	2664		

<i>Feed costs (hay for winter period)</i>	<i>Specification</i>	<i>Total demand (kg yr<sup>-1</sup>)</i>	<i>Production or purchase price (USD kg<sup>-1</sup>)</i>	<i>Production or purchase costs (USD yr<sup>-1</sup>)</i>	<i>Sum (USD yr<sup>-1</sup>)</i>
Normal situation	Farm own production of reed hay	123728	0,03	3712	<b>3.712</b>
Decreasing water inflow	Farm own production of reed hay	61864	0,03	1856	<b>8.042</b>
	Purchase of lucerne hay	61864	0,10	6186	
Worst case	Purchase of reed hay	61864	0,08	4949	<b>13.610</b>
	Purchase of lucerne hay	61864	0,14	8661	
<b>Total variable costs, normal situation</b>					<b>3.880</b>
<b>Total variable costs, decreasing water inflow</b>					<b>8.211</b>
<b>Total variable costs, worst case</b>					<b>13.778</b>
<b>Contribution margin (USD yr<sup>-1</sup> per stock)</b>					
<b>Normal situation</b>					<b>12.941</b>
<b>Decreasing water inflow</b>					<b>8.611</b> 33,462067
<b>Worst case</b>					<b>3.043</b> 76,484724
<b>Contribution margin ratio (%)</b>					
<b>Normal situation</b>					<b>77</b>
<b>Decreasing water inflow</b>					<b>51</b>
<b>Worst case</b>					<b>18</b>

#### **Fixed costs**

<i>Labor</i>	<i>Number of employees</i>	<i>Monthly salary (USD)</i>	<i>Months per year</i>	<i>Sum (USD yr<sup>-1</sup>)</i>
Permanent employed shepherd	1	174	12	2088,0

<i>Land</i>	Total area (ha)	Leasing price (USD yr <sup>-1</sup> )				
	443	0,29				129
<i>Farm buildings</i>	Material costs (USD)	Useful life (years)	Salvage value (USD)	Annual depreciation (USD yr <sup>-1</sup> )		
Wood stable including hay storage	1716	49	0	35		35
House for employees	2112	49	0	43		43
				Sum of building costs		78,1
<i>Farm vehicles and machinery</i>	Purchase price (USD)	Useful life (years)	Salvage value (USD)	Annual depreciation (USD yr <sup>-1</sup> )	Taxes (USD yr <sup>-1</sup> )	
Used car (mainly private use)	2425	6	0	404	34	438
Used tractor	4900	6	0	817	40	857
Used trailer	1000	6	0	167	0	167
Used mower	1000	6	0	167	0	167
				Sum of machinery costs		1628
				Total fixed costs		3923
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				Net farm income (USD yr <sup>-1</sup> per stock)		
				Normal situation		9.018
				Decreasing water inflow		4.688
				Worst case		-880