

Options for increasing livestock water productivity in the Nile basin

D. Peden, M. Alemayehu, T. Amede, H. Faki, A. Hailelassie, M. Herrero, D. Mpairwe, G. Taddesse and P. van Breugel



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(A CPWF PN37 output)



Key messages



- Livestock are major water users in the Nile Basin.
- Opportunities exist to use water more:
 - Effectively, productively, profitably & sustainably
 - By integrating water and livestock
 - In investment, development & management



Partners

Agricultural Economics and Policy Research Center (Sudan)
Animal Resources Research Corporation, (Sudan)
Care-Ethiopia
Ethiopian Institute for Agricultural Research
International Livestock Research Institute (ILRI)
International Water Management Institute (IWMI)
Makerere University (Uganda)

Outline



- Importance of livestock in the Nile.
- Livestock water productivity framework.
- What are the implications for the Nile?
- What next?

Distribution of Nile livestock systems

Country	Land area <u>in basin</u> (1000 km ²)	Livestock systems (% land area in basin)		
		Grazing	Mixed rainfed	Mixed irrigated
Sudan	1,933	75	22	<1
Ethiopia	362	23	71	<1
Egypt	286	87	1	11
Uganda	204	19	72	<1
Tanzania	86	11	76	<1
Kenya	47	13	78	<1
Eritrea	25	27	73	<1
Other 3	51	6	84	<1
Basin total	2,993	61	34	1

Distribution of Nile livestock & people

Country	In basin populations (millions) ^{***}				
	Cattle	Sheep	Goats	Total	People
Sudan ^{***}	34	32	26	92	27
Ethiopia	14	5	4	23	25
Egypt	3	3	2	8	62
Uganda	5	1	3	9	23
Tanzania	6	1	3	9	7
Kenya	4	1	2	7	12
Eritrea	1	1	1	2	1
Other 3	1	2	1	4	12
Basin total	67	47	41	155	170

⁶
^{***} Based on data synthesis – basin census needed

Nile Livestock:

Important water users

- Livestock outnumber people.
- 50% of rainfall lost in grazing lands.
- Animal feed > human food demand
- Water for feed > water for food.
- Current management degrades land & H₂O.
 - 50% of grazing lands.
 - Most rural domestic water contaminated.
- Mixed temperate mixed crop-livestock systems - hot spots for action.

What is livestock water productivity

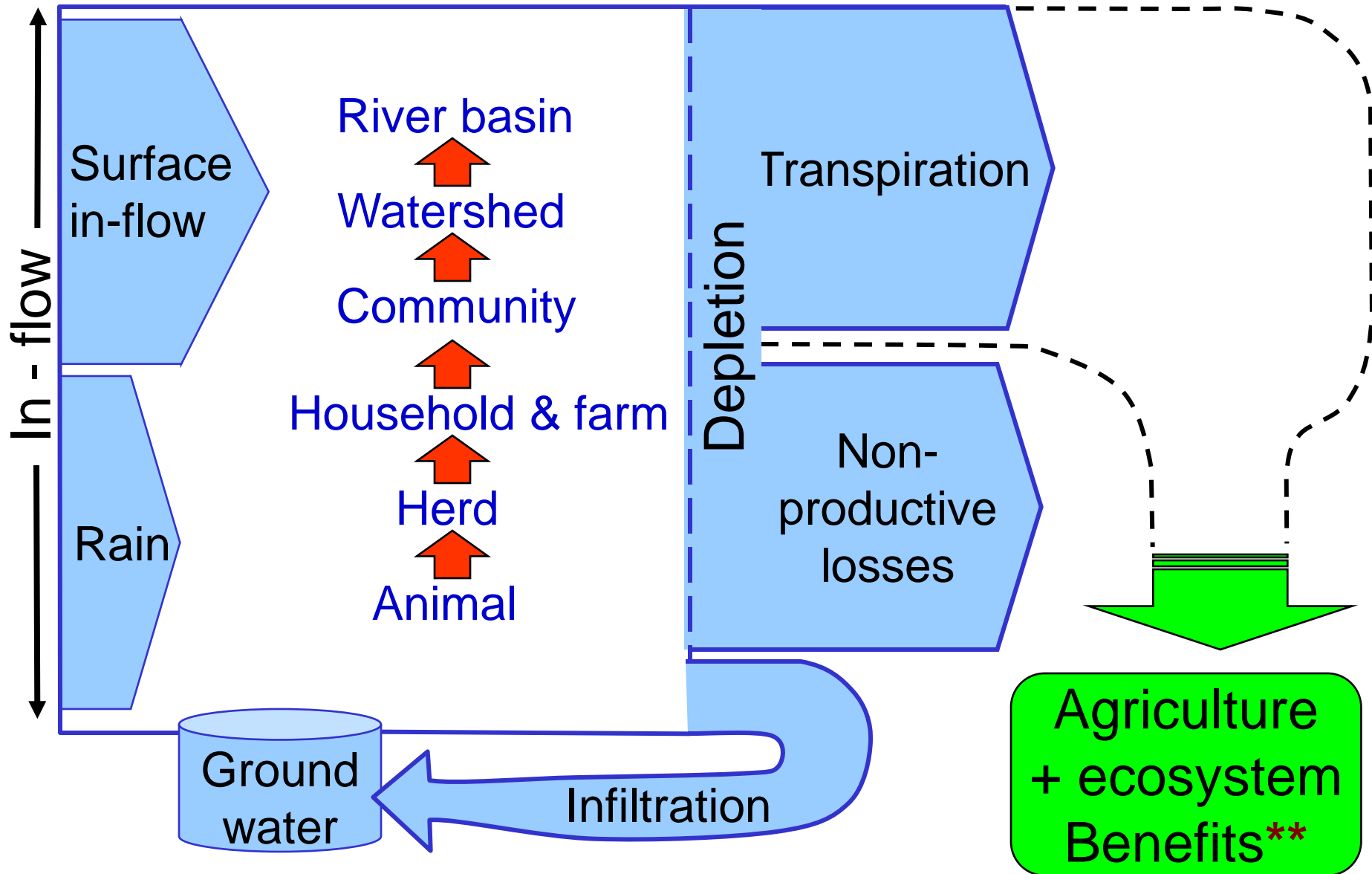
(An entry point for INRM, IWRM & IRBM)

$$\text{LWP} = \frac{\sum(\text{Net beneficial outputs})}{\sum(\text{Depleted water})}$$

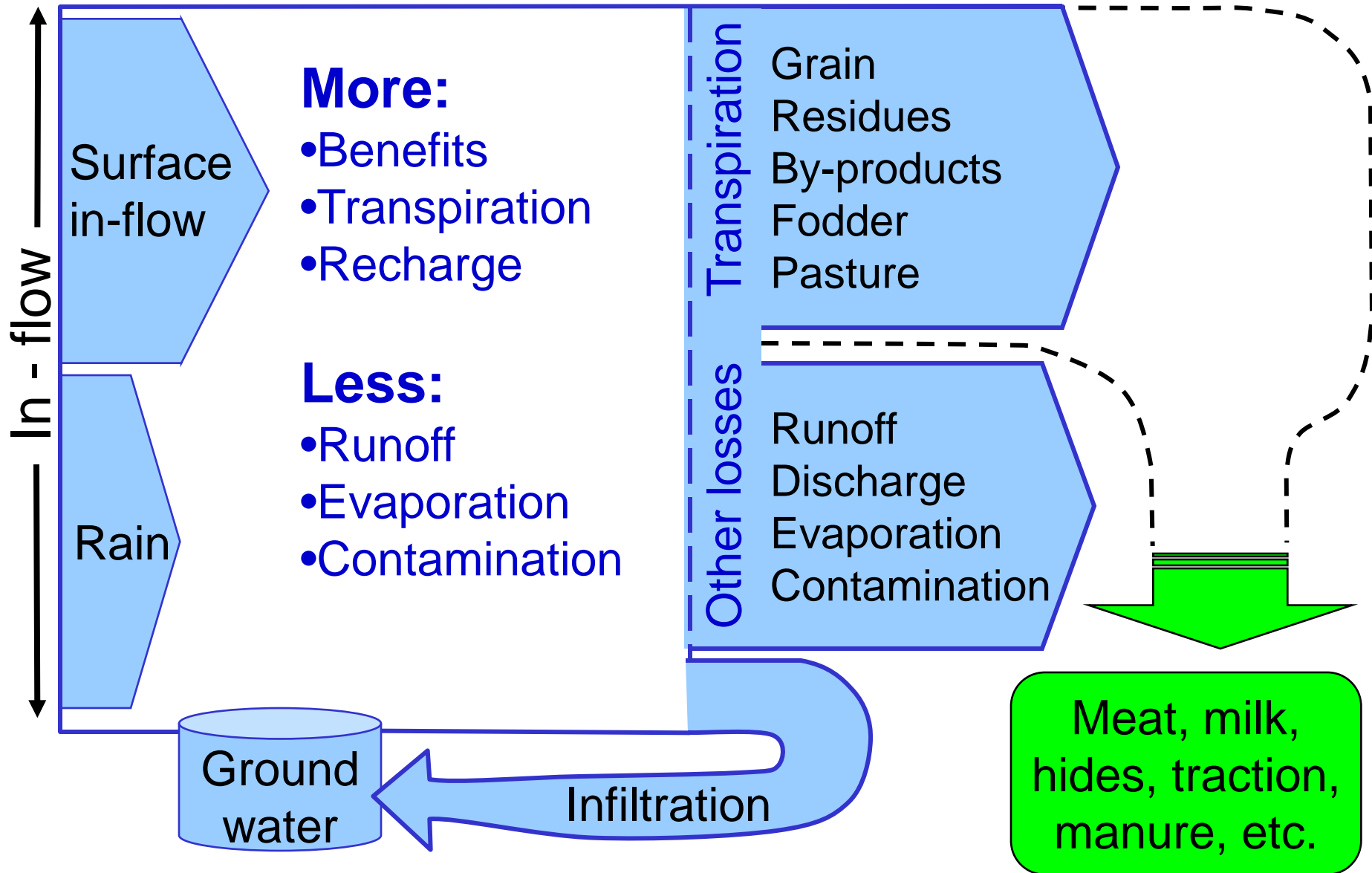
- **Benefits:** Meat, milk, hides, traction power, manure, eggs, whole animal sales, drought security, wealth savings, etc.
- **Depleted water:** Transpiration, evaporation, discharge & contamination.
- **Units:** US\$/m³ but alternatives exist.

(Only a few species considered so far) ⁸

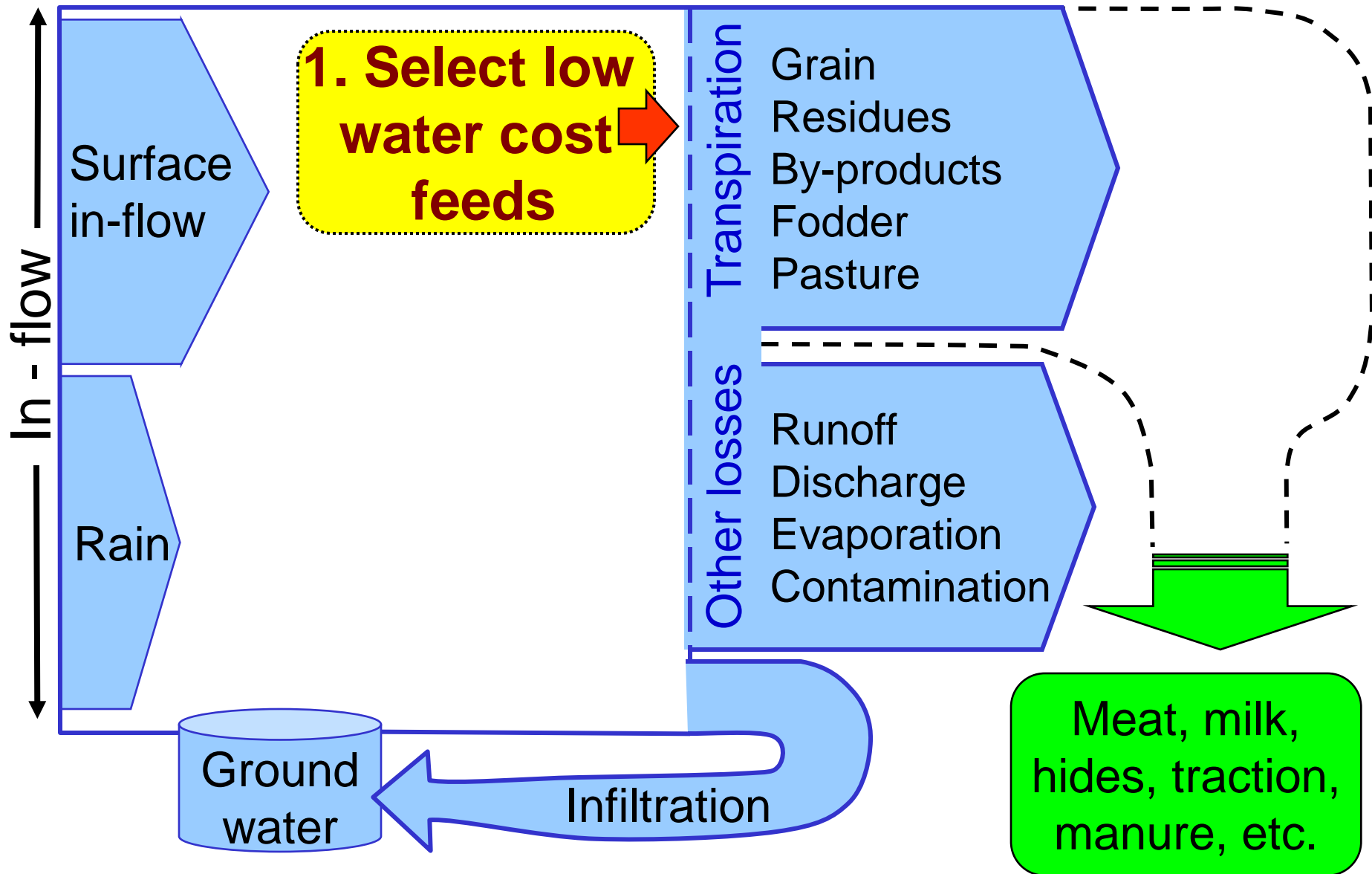
Basic water accounting framework



Livestock water productivity challenge

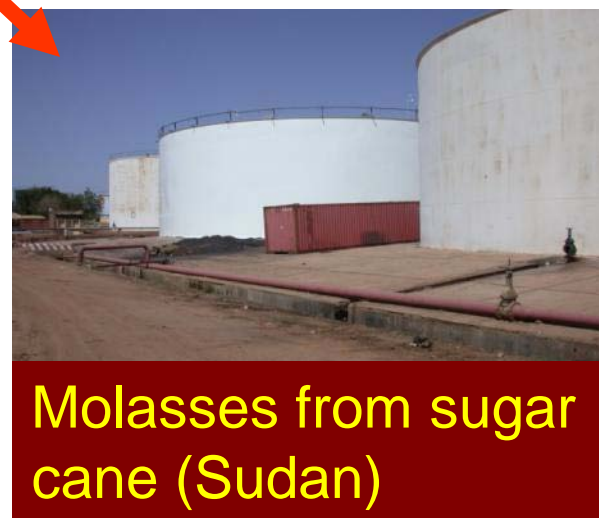


Four LWP improving strategies: Feed sourcing

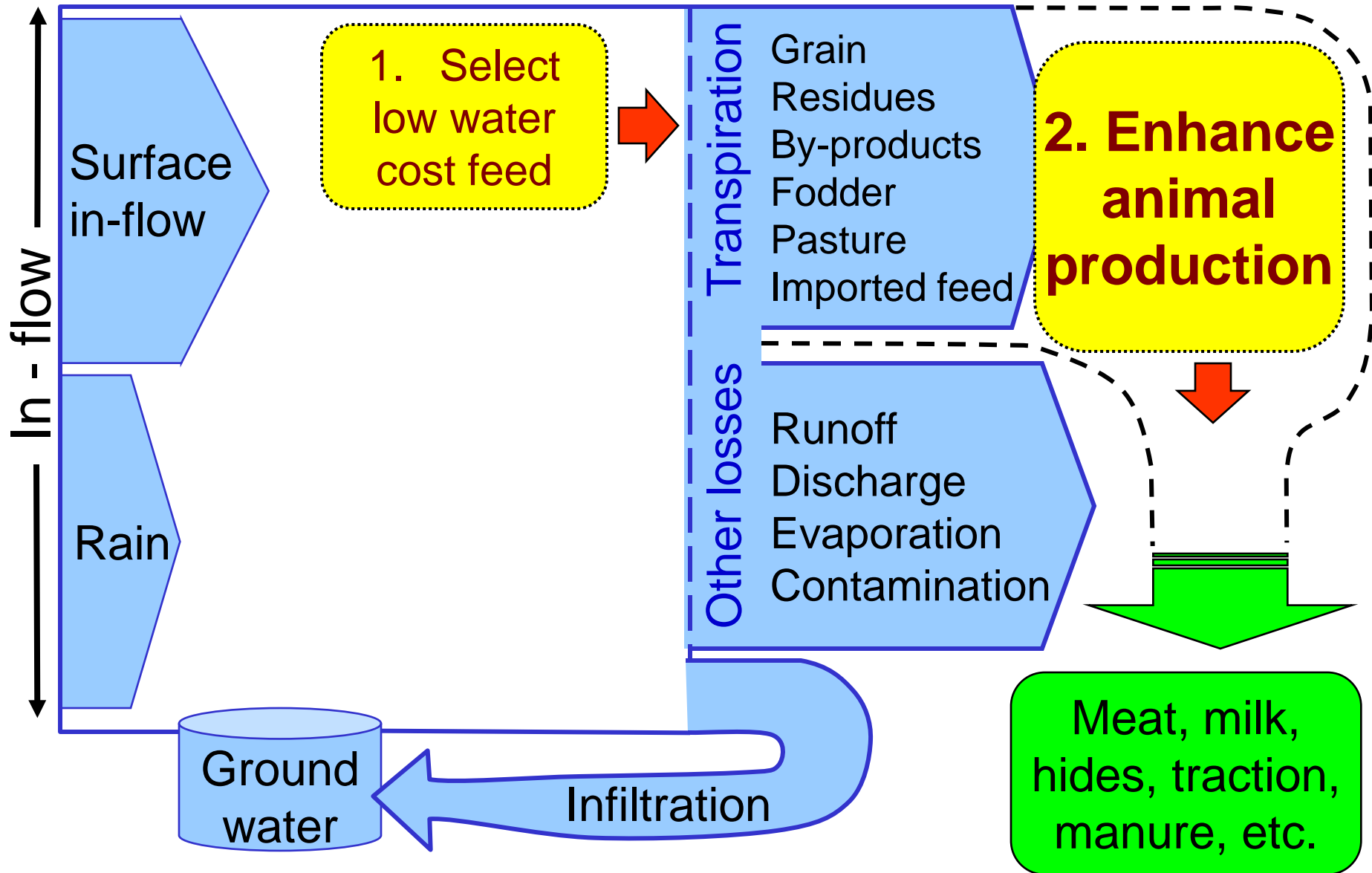


Select low water cost feeds

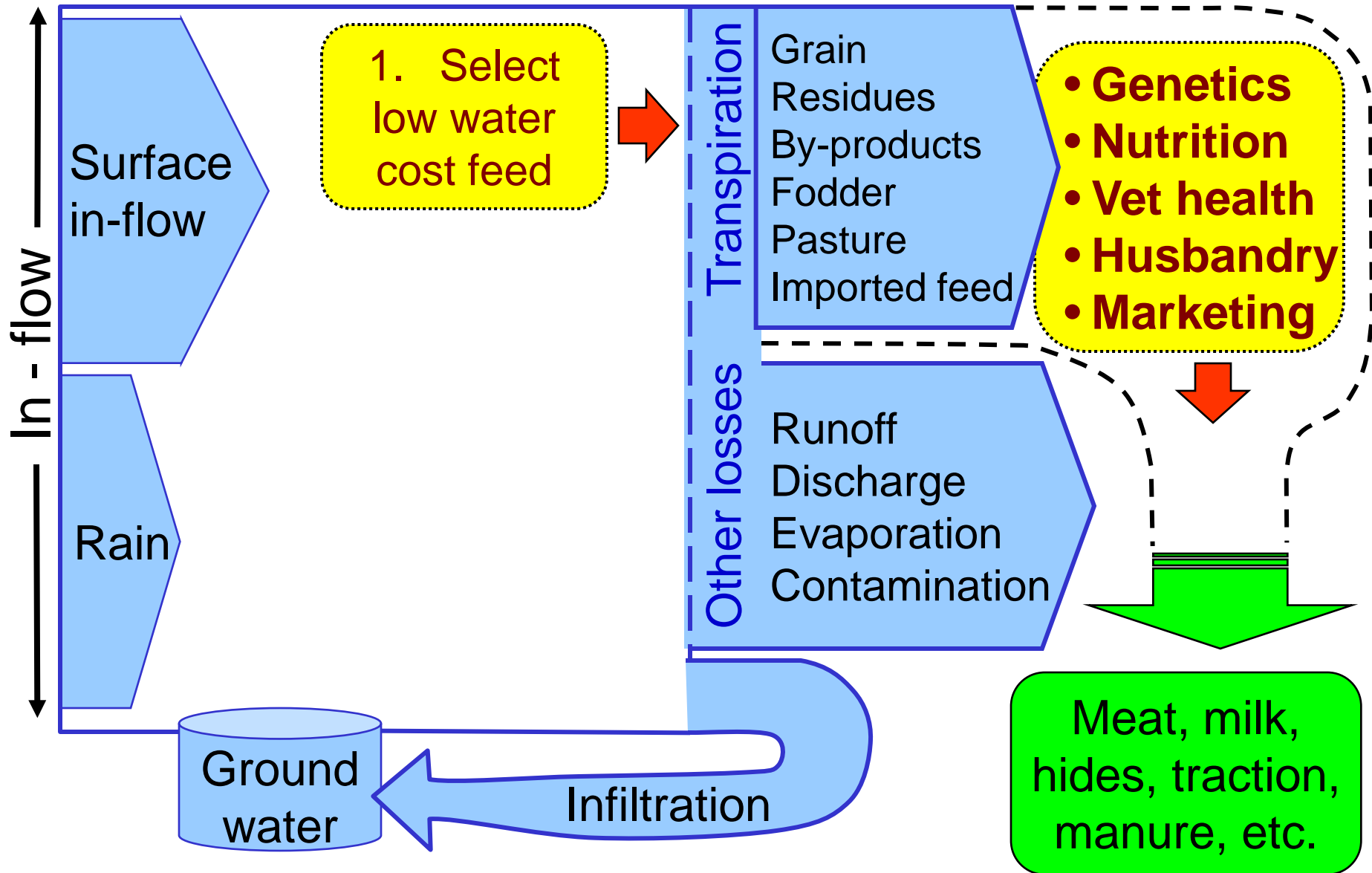
- Crop residues
- Crop by-products
- Succulents in dry lands unsuited for crops



Four LWP improving strategies: Animal Production



Four LWP improving strategies: Animal Production



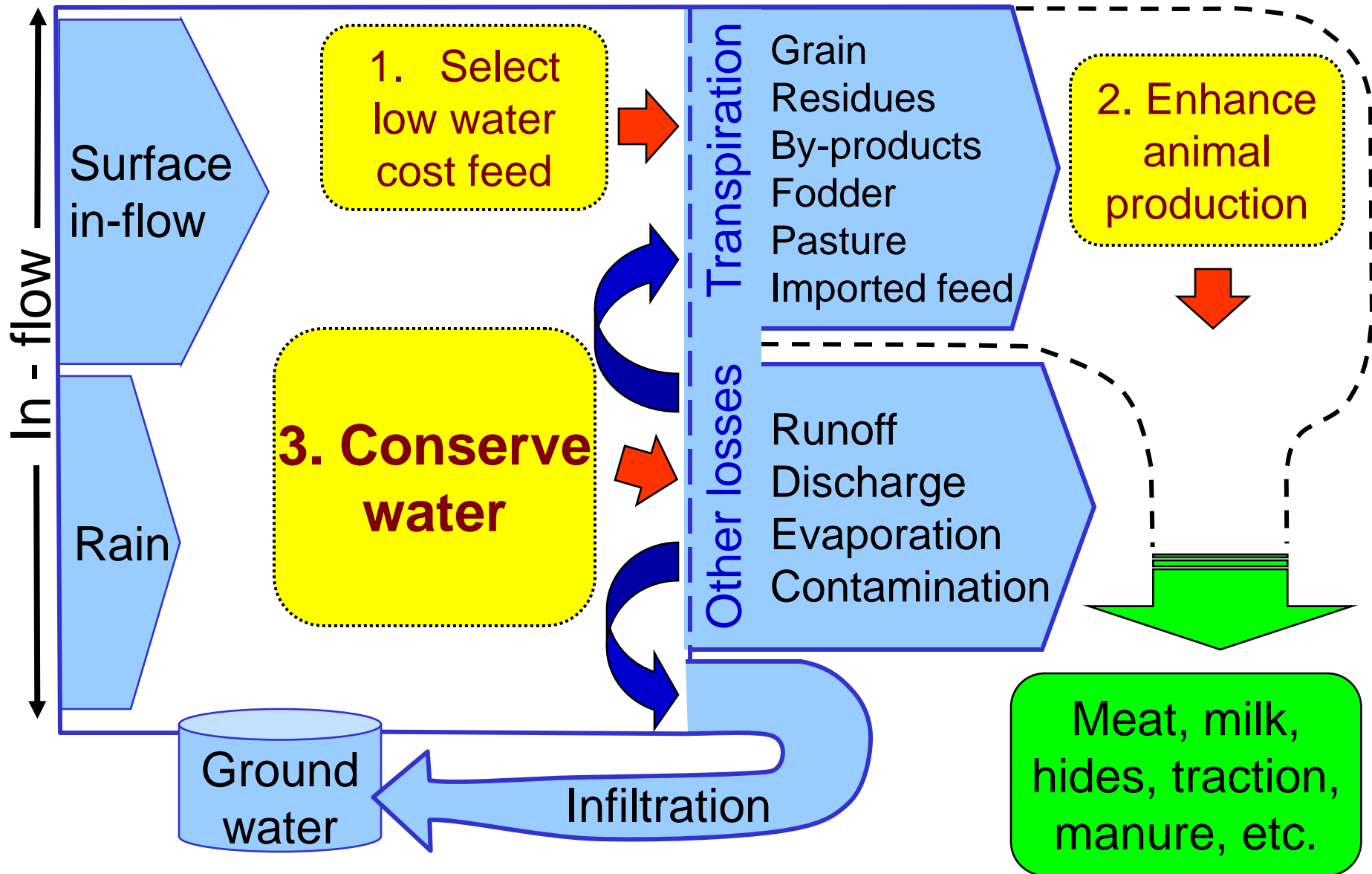
Enhance animal production

(Reduce stress, mortality & morbidity)

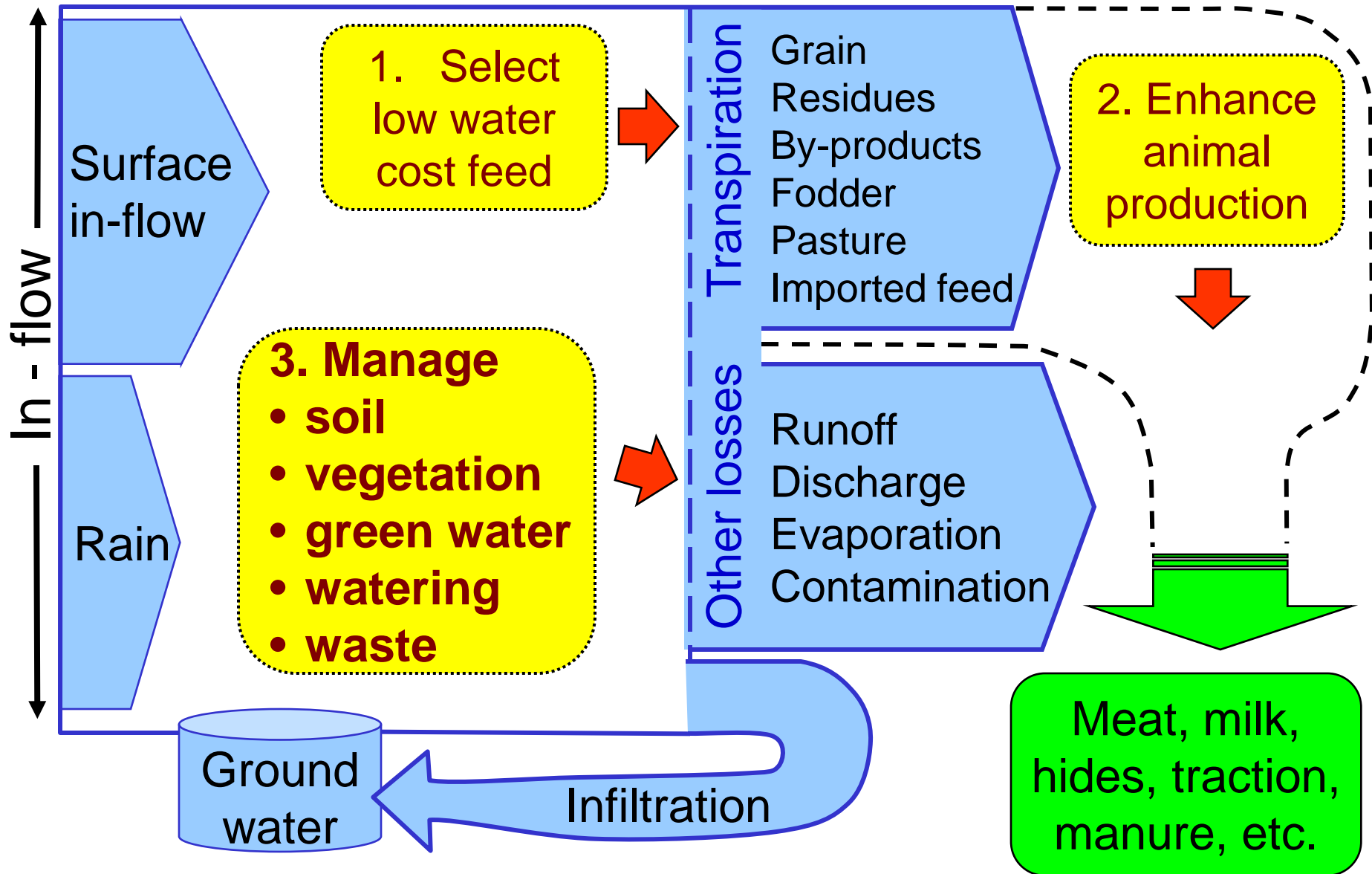
- Select drought hardy animals
- Promote marketing of dairy products
- Adopt zero grazing and watering



Four LWP improving strategies: Conserve water



Four LWP improving strategies: Conserve water



Conserve water

(Vegetation and drinking management)

- Limit animal access to open water and riparian habitats; use drinking troughs.



Before



After

- Rehabilitate & maintain rangelands; limit animal numbers & re-establish pasture



Before



After

Conserve water & soil

Land-use in Ethiopia	Area (%)	Estimated soil loss	
		% national loss	t/ha/year
Mixed crop-livestock systems	13	45	42
Grazing	51	21	5

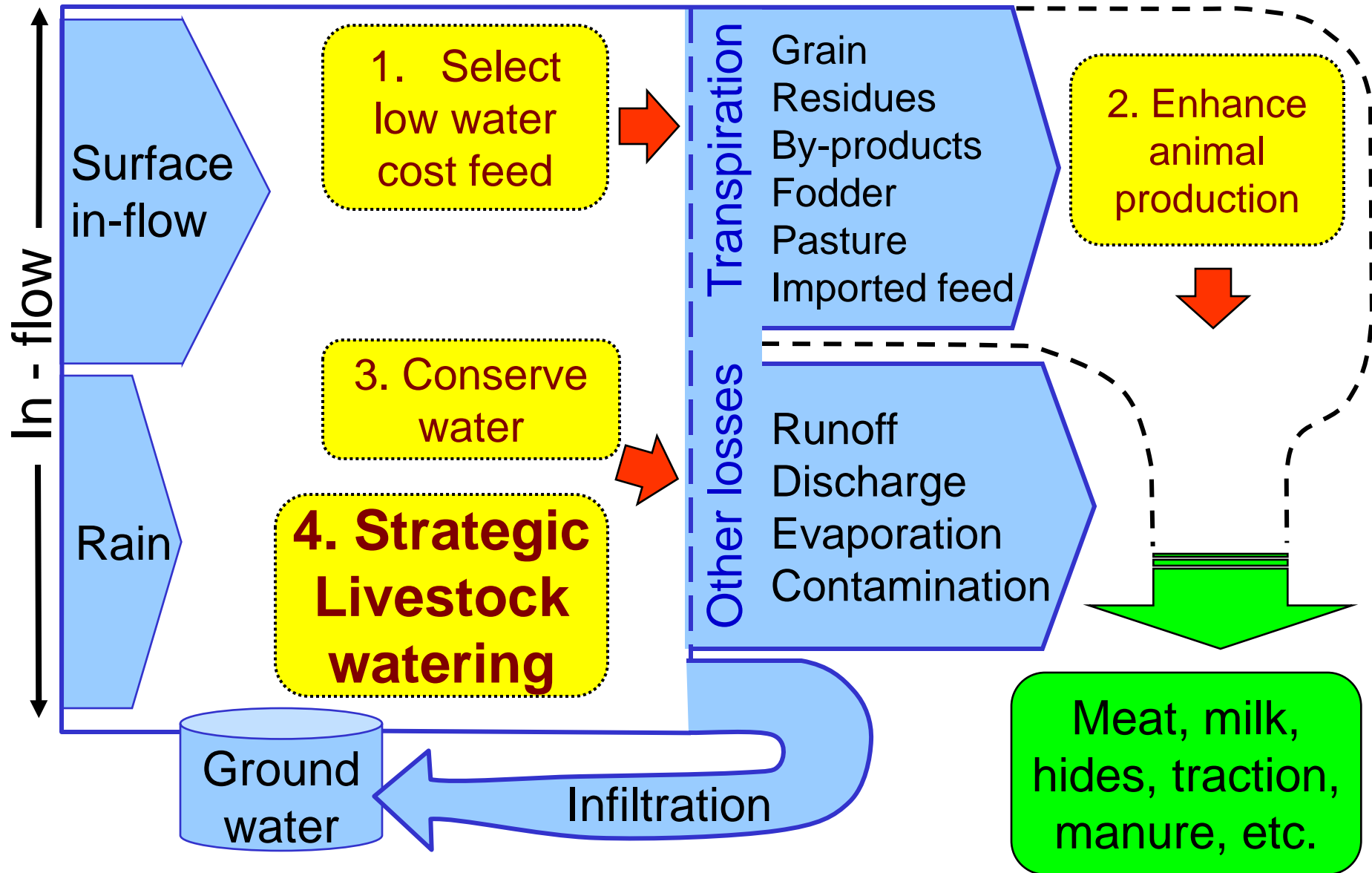
Source: Hurni (1987)



Highland priorities

- Conservation agriculture
- Manure management
- Grazing management

Four LWP improving strategies: Watering sites



Balance feed & water distribution to increase LWP

- Low LWP near water points
 - Overgrazing
 - Rain produces little feed.
- Low LWP far from watering points
 - Drinking water constraints prevent grazing
- Solution
 - Limit grazing near watering points.
 - Develop new watering points where surplus feed exists.
 - **Difficult but needed!**



Implications for the Nile

- Half of rainfall lost as ET in grazing lands
 - Manage ET for more benefits
 - Shift E to T
- More depleted in mixed crop-livestock
- Potential to reduce water use by 50% to 90%.
- 4 helpful strategies (policy & practice)
 - Feed sources.
 - Adopt existing animal science tools.
 - Animal management to conserve water.
 - Feed-water-animal balance.

Implications for the Nile

- Integrate crop-livestock-water development for improved production, livelihoods and sustainability.
- Identify areas to promote and reduce livestock production
 - Taking into account trade-offs with other water users.

What next?

- Build on agreement between NBI & CGIAR.
- Strengthen collaboration between livestock subsector, NBI & member states.
- Improve coverage and quality of livestock & vegetation data sets for the Nile Basin.
- Collaborate in policy development that ensures livestock contribute to poverty reduction, benefit sharing and sustainability.
- Identify and encourage local level livestock-water management intervention options.

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THANK YOU!

