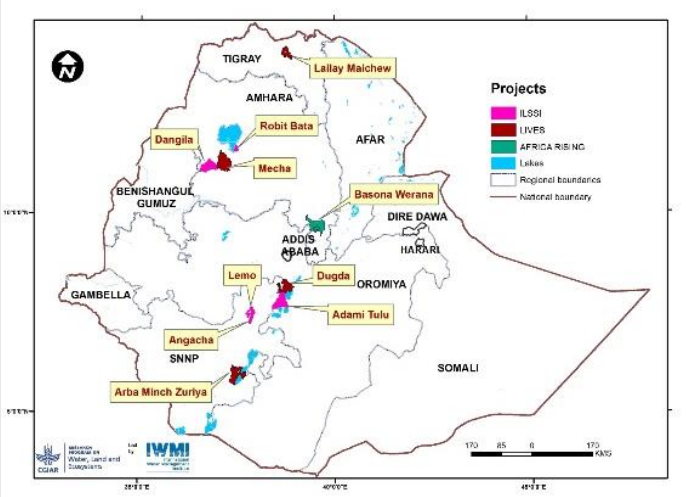
Irrigated fodder opportunities for small scale irrigators

Increasing and diversifying food production through irrigation in the dry season improves livelihoods. Entrepreneurs and farmers are already using groundwater, river or stream pumping, and private small reservoirs and ponds in emerging irrigation systems. Irrigated forages might be one of the options to increase people's livelihood in Ethiopia. Under the **Innovation Lab for Small Scale Irrigation (ILSSI) and Africa Research in Sustainable Intensification for the Next Generation (Africa RISING)** the irrigation of several forages are being tested by the International Water Management (IWMI), the International Livestock Research Institute (ILRI) and national partners. Researchers, with farmers and extension, are piloting ways to improve water management, and access to small scale irrigation technologies for both men and women.



Overview of Africa RISING, ILSSI and LIVES sites

Preliminary results in the first year under Africa RISING and ILSSI

Table 1: Overview of the tested fodder species in three sites.

	Woreda (Region)	Growing period	Length of growing period (days)	Number of farmers
Desho	Angacha (SNNPR)	Apr. – Jul.	90	13
Napier	Bahir Dar (Amhara)	Mar. – Jun.	104	17
Oats & Vetch	Lemo (SNNPR)	May – Jul.	65	21

During the dry season of 2015 farmers irrigated Napier grass in Robit (Bahir Dar Zuria Woreda), Desho in Kericho (Angacha Woreda) and Oats & Vetch in Upper Gana and Jawe (Lemo Woreda) were cultivated using supplementary irrigation (Table 1). Desho and Napier grass were planted using the recommended plant spacing whereas for Oats & Vetch a ratio of 3:1 was dribble seeded (120 kg/ha). Urea (200 kg/ha) was applied at the 50th day after planting for Napier whereas DAP (100 kg/ha) was applied at planting for Oats & Vetch. No fertilizer was applied for Desho grass.

The estimated crop coefficient for the three fodder species within the same crop stage was lowest for Oats & Vetch followed by Desho and Napier (Table 2). The variation of crop coefficients together with the prevailing climatic conditions and the length of the growing period resulted in the highest evapotranspiration values for Napier followed by Desho and Oats & Vetch.

The total water applied during the irrigation season for the first cut varied strongly for the different forages due to differences in climatic conditions at the site as well as their crop water requirement and the length of their growing period till the first cut (Table 3). Differences in fresh biomass and feed quality obtained within the irrigated 100 m² plots led to significant differences in estimated meat and milk production (Table 3). Feeding the produced oats and vetch would lead to higher meat or milk production followed by Desho and Napier.

Table 2: Estimated crop coefficients for Desho, Napier and Oats & Vetch during one irrigation cycle (i.e. single cut harvest).

		Ini. stage	Dev. stage	Mid stage	Lat. stage
Desho	Length (days)*	32	12	40	6
	Crop Coefficient	0.4	0.71	0.89	0.72
Napier	Length (days)*		28	35	42
	Crop Coefficient		0.80	1.38	1.50
Oats and Vetch	Length (days)*	16	13	16	20
	Crop Coefficient	0.29	0.89	1.08	0.71

* Length refers to the length of the growing stage leading to the first cut.

Table 3: Fresh fodder biomass and quality obtained for a single cut within one irrigation cycle.

Feed[1]	Rainfall (mm)	Irrigation[2] (mm)	Fresh yield[2] (t/ha)	Dry yield (t/ha)	Crude protein (%)	Metabolisable Energy (MJ/kg)	Meat[2] (kg)	Milk[2] (kg)
Desho	182	56 ± 8	67.7 ± 13.5	13.3	17.8	6.96	24.5	163.4
Napier	282	342 ±123	9.5 ± 5.3	2.2	8.6	8.00	5.4	32.3
Oats				12.8	9.2	7.92	30.5	184.7
Vetch	173	43 ±9	65.3 ± 10.0	4.5	20.0	8.82	13.2	74.3
Weed				1.4	17.9	8.10	3.5	21.2

[1] Data on feed quality is based on one single cut. The yield for Napier is an average of the first cut after 104 days and the second cut (30 days later) given that the yield for the first cut is very low and increases in the subsequent cuts due to tillering and increased growth. Dry matter and feed quality for Oats, Vetch and weed obtained from the irrigated Oats & Vetch plots were seperately analysed.

[2] Average and standard deviation based on all particpating farmers. Milk and meat production is based on feeding the dry matter obtained from 100 m² to improved cattle breed. Animal mainentance requirements are assumed to be provided by other feed resources than the planted forages.

Outlook

In 2016, the quantification of total biomass following multiple cuts relative to the water input of the established forages are further investigated under ILSSI and Africa RISING. Furthermore, IWMI together with ILRI and national partners under the Livestock and Irrigation Value Chain for Ethiopian Smallholders funded by GAC (Global Affairs Canada -LIVES) is carrying out irrigated fodder assessments on Rhodes Grass, Elephant grass, AlfaAlfa, Sesbania and Desmodium with regards to irrigation, fodder quality and quantity as well as its socio-economic benefit.

Further information: This leaflet has been produced by the International Water Management Institute (IWMI; www.iwmi.org) and the International Livestock Research Institute (ILRI; www.ilri.org). For more information on this project in Ethiopia, contact: **Dr. Petra Schmitter (IWMI)**, **project leader in Ethiopia and Tanzania**, (p.schmitter@cgiar.org), **Dr. Michael Blummel (ILRI), project leader in Ethiopia, Tanzania and Ghana (**m.blummel@cgiar.org**)** and **Dr. Nicole Lefore, project manager** (e-mail: n.lefore@cgiar.org).