



Water Related Indicators for Sustainable Crop-Livestock Intensification Planning in Ethiopia

Report of a Regional Workshop (South), Arba Minch, 16 August 2012

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The Africa Research in Sustainable Intensification for the Next Generation (Africa RISING) program comprises three research-for-development projects supported by the United States Agency for International Development as part of the U.S. government's Feed the Future initiative.

Through action research and development partnerships, Africa RISING will create opportunities for smallholder farm households to move out of hunger and poverty through sustainably intensified farming systems that improve food, nutrition, and income security, particularly for women and children, and conserve or enhance the natural resource base.

The three projects are led by the International Institute of Tropical Agriculture (in West Africa and East and Southern Africa) and the International Livestock Research Institute (in the Ethiopian Highlands). The International Food Policy Research Institute leads an associated project on monitoring, evaluation and impact assessment.



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Background

Arba Minch University (AMU) received a request from International Water Management Institute (IWMI) to review and improve a project work entitled “*Water Related Indicators for a Sustainable Crop-Livestock Intensification Planning in Ethiopia*”. Accordingly on August 16, 2012, the University organized a consultation workshop by inviting experts from potential stakeholders including regional and Zonal Water Bureau, Environmental Protection Authority, Irrigation and resources management Agency, and University staff. The workshop provided a unique opportunity to bring together participants with a wide range of experience. A total of 22 professional participated on the workshop.

The main objective of the workshop is to create a platform for professional to discuss on the aforementioned project objective and arrive at agreed water indicators and their threshold values for sustainable crop-livestock intensification planning in Ethiopia. As per the schedule (See Annex A), presentations were made to the participants in two sessions first on the background and objectives of the project and then about the mapping toolbox. Subsequently, discussions were made by the participants and recommendations were articulated. It can be said that the one day workshop was concentrated but productive.

Participants

After a brief introduction about the objective of the workshop, participants were then invited to introduce themselves, give a little information about their experience and share their expectations for the workshop. The project was well attended. A total of 35 participants attended the workshop from different stake holders and professional that includes staffs of Arba Minch University, Experts from Regional Water Bureau, Regional Irrigation and resource management Agency, Regional Environmental protection, Zonal strategic planning (from office of Finance and Economy office). The workshop was moderated by Dr. Kassa Tadele and Dr. Mekonen Ayana. The participants were grouped in to 4 groups based on specialization and interests (see Table 1). During the discussions, the participants took knee interest to make an input to the project document, discussed in detail and suggested some important inputs that improve the project document.

Table 1: Groups formed

Group	Trajectories
1	soil and water conservation in crop livestock systems
	vertisol
2	small scale irrigation in crop livestock systems
	large scale irrigation
3	rainfed smallholder intensification in crop-livestock systems or agro-pastoralist systems
	rainfed commercial farming intensification in crop-livestock systems or agro-pastoralist systems
4	livestock based intensification
	urban dairy

Workshop outputs

Each group made detail discussions on the project document and made presentations during the general discussion. Though, the discussion was for one day the groups recommended some additional water related indicators and suggested new threshold values for some of the trajectories.

Major results of the workshop are summarized below and given in Annex C.

- For some trajectories additional indicators are required to acquire best results during mapping
- For some of the indicators, the threshold values are binary (yes OR No) that may affect the mapping. Thus, it requires some work to classify in a range in order to accommodate more cases.
- A certain weightage has to be given for each indicator since they don't affect the trajectory equally.
- While considering the ground truth, there needs some adjustment on some of the threshold values as indicated on Annex C

In summary, during the discussion the following threshold values were suggested and some questions were raised:

Trajectory 1

- Does the soil erosion equation used include farm management practices?
- Can water harvesting and conservation culture inculcated as indicators?
- Suggested: Percentile of TLU/household for livestock density to be **0.7**

Trajectory 2

- **Annual rainfall** < 800 mm suggested as additional indicator
- The data used may be old, for example it doesn't include the recently identified areas in SNNPR. (government development direction)
- Thus, % of potential small scale irrigation density **0.005** suggested

Trajectory 4

- All weather road doesn't seem the right criteria

Trajectory 5

- Max Aridity index to be **0.35** is suggested (To include some of the semi-arid regions which are almost Arid in some measures?)
- Livestock density to be **0.3** (Existing experience) is suggested

Trajectory 7

- Feed resources is suggested as addition indicator

Trajectory 7

- Is it possible to consider soil acidity and salinity managements as indicators?

Trajectory 8

- % of Protected forest areas to be **0.7** is suggested

Annex A: Program of the workshop

Workshop on WaterRelated Indicators for Crop-Livestock intensification planning in Ethiopia		
Thursday August 16/2012		
Time	Activities	Speaker/Responsible
09:00 - 09:10	Registration	Endalchachew E., Hailay Z. Bereket
09:10 -09:20	Introducing the program	Dr Mekonen Ayana
09:20 - 10:30	Introduction on project background	Dr. Kassa Tadele
10:30-11:30	Mapping approach and toolbox	Dr. Kassa Tadele
11:30 - 12:30	Discussion and group forming	Dr. Kassa Tadele, Dr Mekonen Ayana
12:30 - 2:00	Lunch Break	Logistic Team
2:00 - 3:30	Group discussions	
3:30 - 3:45	Health Break	Logistic Team
3:45 - 4:30	Group Presentations	
4:30 - 5:15	General Discussion	Participant
5:20	End of the program	

Annex B: List of Participants

No	Name	Organization/Department
1	Dr. Kassa Tadele	AMU, Water resources and Irrigation
2	Dr. Mekonen A.	AMU, Water resources and Irrigation
3	Dr. Negash W.	AMU, Water resources and Irrigation
4	Dr. Guchie G.	AMU, Water resources and Irrigation
5	Dr. Nejib M.	AMU, College of Agriculture
6	Dr. Bogale G/M.	AMU, Hydraulics and Water resources
7	Mr. Tuma A.	AMU, College of Agriculture
8	Mr. Tadele	SNNPR Irrigation
9	Mr. Behailu	SNNPR Water Bureau
10	Mr. Ameriga, G	SNNPR Environmental protection
11	Mr. Yohannes H.	AMU, Hydraulics and Water resources
12	Mr. Gezahegn B.	AMU, Water supply and Environmental
13	Mr. Zerihun A	AMU, Water resources and Irrigation
14	Mr. Amrach B.	AMU, Water resources and Irrigation
15	Mr. Eshetu A.	AMU, Water supply and Environmental
16	Mr. Gabir G/E	AMU, Water resources and Irrigation
17	Mr. Hailay Z.	AMU, Water resources and Irrigation
18	Mr. Endalkachew B.	AMU, Water resources and Irrigation
19	Mr. Mikias A.	AMU, Hydraulics and Water resources
20	Mr. Bereket W.	AMU, Hydraulics and Water resources
21	Mr. Mesele A	AMU, College of Agriculture
22	Mr. Ashenafi D.	AMU, College of Agriculture
	Mr. Charkos A	Gamgofa Zone Finance and Economy

Annex C: Indicators and threshold values

No	trajectory	indicator		thres hold	Unit	suggested threshold
1	soil and water conservation in crop livestock systems	Erosion	>	0.1	% of area with critical erosion (loss >11 ton/ha/year)	0.1
		population density	>	0.6	percentile of pop/km (0-1)	top 60% =0.6
		livestock density	>	0.7	percentile TLU/household (HH)	top 60% =0.6
2	small scale irrigation in crop livestock systems	potential small scale irrigation density OR	>	0.005	% of area (0-1)	0.01
		shallow ground water	>	1	% of area (0-1)	1 = not taken into account
		protected forest area	<	0.5	% of area (0-1)	0.5
		access to market	<	8	hours from market	8
3	rainfed smallholder intensification in crop-livestock systems or agro-pastoralist systems	minimum annual rainfall	>	500	mm/year (200-2500)	500
		maximum annual rainfall	<	2000	mm/year >than min rainfall	2000
		protected forest area	<	0.9	% of area (0-1)	0.9
		population density	>	0.6	percentile pop/km (0-1)	top 60 % = 0.6
4	large scale irrigation	potential large scale irrigation	>	0.01	% of area (0-1)	0.01=taking all the schemes
		has an all-weather road	>	1	1= yes 0=no	1
5	livestock based intensification	minimum aridity index	>	0.03	index (0-1)	0.03
		maximum aridity index	<	0.35	index > min AI	0.2
		population density	<	0.25	percentile of pop/area (0-1)	bottom 25%=0.25
		livestock density	>	0.3	percentile of	top 20% =0.2

					TLU/HH (0-1)	
		difference between livestock capacity and actual	>	0	0 = no gap	0
6	urban dairy	access to market OR	<	4	hours to market	4
		Addis neighborhood	>	1	1= yes 0=no	0
7	vertisol	vertisol	>	0.1	% of area (0-1)	0.1
		minimum annual rainfall	>	800	mm/year	800
8	rainfed commercial farming	minimum annual rainfall	>	800	mm/year (200-2500)	800
	intensification in crop-livestock systems or agro-pastoralist systems	maximum annual rainfall	<	2000	mm/year >than min rainfall	2000
		protected forest area	<	0.7	% of area (0-1)	0.9
		population density	<	0.4	percentile pop/km (0-1)	bottom 40% = 0.4