

## SUPPLEMENTARY MATERIAL

### Historical and projected land-use / land cover changes of the Welmel River Watershed, Genale Dawa Basin, Ethiopia

Solomon Eshete Ayalew<sup>1)</sup> ✉, Tewodros Assefa Nigussie<sup>2)</sup>

<sup>1)</sup> Ministry of Labor and Skills, Addis Ababa, Ethiopia

<sup>2)</sup> Hawassa University, Institute of Technology, Hawassa, Ethiopia

**Table S1.** Error matrix of the classified map for the year 1990, 2005 and 2020

Classified data	Reference data						row total	user's accuracy (%)
	GR/RGE	SCRB/BSH	WD	FRST	AGR/SET			
<b>1990</b>								
GR/RGE	13	0	1	0	1	15	86.67	
SCRB/BSH	0	9	0	1	0	10	90.0	
WD	0	1	16	2	1	20	80.0	
FRST	1	0	1	37	1	40	92.5	
AGR/SET	1	2	3	1	23	30	76.67	
Column total	15	12	21	41	26	115		
Producer's accuracy (%)	86.67	75	76.19	90.24	88.46			
Kappa coefficient = 81.86%      Overall accuracy = 85.22%								
<b>2005</b>								
GR/RGE	12	0	0	2	1	15	80.0	
SCRB/BSH	0	9	1	0	0	10	90.0	
WD	0	0	17	1	2	20	85.0	
FRST	2	0	2	34	2	40	85.0	
AGR/SET	1	2	0	3	24	30	80.0	
Column total	15	11	20	40	29	115		
Producer's accuracy (%)	80.0	81.82	85.0	85.0	82.76			
Kappa coefficient = 78.34%      Overall accuracy = 83.48%								

continue Tab. S1

Classified data	Reference data						
	GR/RGE	SCRB/BSH	WD	FRST	AGR/SET	row total	user's accuracy (%)
<b>2020</b>							
GR/RGE	11	1	0	1	2	15	73.33
SCRB/BSH	1	8	0	1	0	10	80.0
WD	0	1	19	0	0	20	95.0
FRST	0	0	4	36	0	40	90.0
AGR/SET	1	0	0	1	28	30	93.33
Column total	13	10	23	39	30	115	
Producer's accuracy (%)	84.61	80.0	82.61	92.31	93.33		
Kappa coefficient = 85.1%      Overall accuracy = 88.69%							

Explanations: AGR/SET = agriculture/settlement, FRST = forestland, WD = woodland, GR/RGE = grassland/rangeland, SCR/BSH = scrubland/bushland.

Source: own study.

**Table S2.** Transition area matrix (km<sup>2</sup>) of land use / land cover (LULC)

LULC class	AGR/SET	FRST	GR/RGE	SCR/BSH	WD	Total
<b>2020</b>						
AGR/SET	83.17	3.16	4.50	0.00	16.14	103.66
FRST	124.17	661.33	65.65	0.08	110.27	958.19
GR/RGE	28.00	2.06	15.73	0.16	10.24	56.19
SCR/BSH	0.87	2.14	24.25	78.13	9.61	111.70
WD	69.03	12.17	45.40	3.20	105.30	231.80
<b>Total</b>	<b>301.94</b>	<b>677.55</b>	<b>152.23</b>	<b>81.57</b>	<b>248.25</b>	<b>1461.54</b>
<b>2050</b>						
AGR/SET	288.26	0.12	1.22	0.00	5.27	294.87
FRST	113.13	425.84	44.19	0.00	96.74	679.89
GR/RGE	33.32	0.29	113.75	0.00	8.18	155.54
SCR/BSH	4.25	1.23	16.13	55.57	4.41	81.59
WD	41.60	0.03	13.26	0.00	194.75	249.64
<b>Total</b>	<b>480.57</b>	<b>427.50</b>	<b>188.54</b>	<b>55.57</b>	<b>309.35</b>	<b>1461.54</b>

Explanations as in Tab. S1.

Source: own study.