

# Appendices

## Appendix 2.1 Change detection classification system

Change type					
Non- forest change			Forest change		
Undetermined change	Gain of vegetation	Loss of vegetation	Undetermined change	Gain of vegetation	Loss of vegetation
Not associated with vegetation ((bare to water	.1 complete partial .2	.1 complete partial .2	Not associated with gain or loss of vegetation	complete .1 hardwood - conifer - hardwood/- conifer mixture partial .2	complete .1 hardwood - conifer - hardwood/ - conifer mixture partial .2
<u>No change</u> : Ignore in any further analysis- not of interest					

(Modified from Colewell et al. (1980

## Appendix 2.2: Sources of inconsistency or change in multi-date imagery

Other changes		Field changes		
Non uniform areas	Uniform areas	Uncommon		Common
Noise -	Sun angle - differences	uncontrolled	Controlled	Seasonal
Scattering -		Damage -	Cutting -	
Striping -		Deciduous -	Treatments on -	
Rectification -		shrubs growing	regeneration areas	

(Modified from Hame (1986

Appendix 3.1: Field data form

**Change Detection in Tree species Composition and Structure  
in Meidob Hills Area, Northern Darfur State, Sudan**

**Field data form**

**Land cover characteristics**

Region.....Site.....Date...../...../2010  
 .....Sample No.....Coordinate: Lat..... Long  
 .....Investigator name

**Degradation status .a**

Water erosion	Wind erosion	Description of the amount of grasses, types/no. intensity	Description of the existing tree cover, type/no. intensity
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**Land Cover .b**

W      R      B      G      S/G      S      T/S      T      TSG

TSG=Tree/Shrub/Grass, T= Trees, T/S= Trees/Shrubs, S= Shrubs, S/G= Shrubs/Grasses, G= Grasses, B= Bare land, R= Rock/Hill, W= Water

**Stand description .c**

<b>Reg. accounts</b>	<b>CD</b>	<b>(H(m</b>	<b>(DBH(cm</b>	<b>T/S. SPP</b>
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T/S.SPP.= Trees/Shrubs Species, DBH= Diameter at Breast Height, H= Height,  
.CD= Crown Diameter, Reg. = Regeneration

**:Comments .d**

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.....  
.....  
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**Land use .2**

**Type .a**

O P Ag G F

F = Forestry/Fuel Wood, G = Grazing, Ag = Agriculture, P = Populated, O = Other

**b. Status**

Abandoned and re-vegetated

Abandoned and baren

In use

**c. Water**

Availability of water occasionally

Availability of water all year

**d. Soil type**

O R KA L SC C S

S= Sandy, C= Clay, SC= Sandy Clay (Gardoud), L= Loam, KA= Khor Alluvial, R= Rock/Basement, O= Other

**:e. Comments**

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Appendix 3.2: Sampling Points

Class	Latitude	longitude	Point
Yellow	15.240555	26.16141	1
Yellow	15.232426	26.017610	2
Green	15.216118	26.024878	3
Yellow	15.191007	26.058715	4
Blue	15.206654	26.104693	5
Red	15.202492	26.106875	6
Blue	15.184568	26.109289	7
Blue	15.178993	26.124663	8
Yellow	15.089108	26.154662	9
Blue	15.081720	26.155147	10
Yellow	14.977243	26.185027	11
Blue	14.968626	26.202740	12
Blue	14.936018	26.204256	13
Blue	15.170419	26.205863	14
Blue	15.165210	26.209164	15
Red	15.159547	26.218295	16
Blue	15.176810	26.220361	17
Red	15.177949	26.226256	18
Red	15.181111	26.229002	19
Green	15.183112	26.229309	20
Green-*** high	15.178061	26.229397	21
Red	15.18777	26.230512	22
Green	15.183118	26.231055	23
Red	15.181900	26.231757	24

Appendix 3.3: form Factor for different species of the study area

Form factor	Species	Code
<b>0.47</b>	Faidherbia albida	<b>1</b>
<b>0.47</b>	Balanites aegyptiaca	<b>2</b>
<b>0.55</b>	Commiphora africana	<b>3</b>
<b>0.76</b>	Acacia millfera	<b>4</b>
<b>0.38</b>	Boscia senegalensis	<b>5</b>
<b>0.47</b>	Acacia tortilis subsp radiana	<b>6</b>
<b>0.62</b>	Ziziphus spina-christi	<b>7</b>
<b>0.5</b>	Acacia nilotica	<b>8</b>
<b>0.76</b>	Capparis deciduas	<b>9</b>
	Maerua crassifolia	<b>10</b>

Source: Sudan FAO/ FNC Forest Inventory 1998

Appendix 4.1: Diameter class distribution for all trees in the study area

.No	(Range diameter class (cm	Mid dbh classes	No. of trees	%
1	9.9 -6	7.95	87	9.45
2	13.9 -10	11.95	233	25.30
3	17.9 -14	15.95	184	19.98
4	21.9 -18	19.95	148	16.07
5	25.9 -22	23.95	83	9.01
6	29.9 -26	27.95	64	6.95
7	33.9 -30	31.95	47	5.10
8	37.9 -34	35.95	22	2.39
9	41.9 -38	39.95	17	1.85
10	45.9 -42	43.95	14	1.52
11	49.9 -46	47.95	6	0.65
12	53.9 -50	51.95	4	0.43
13	57.9 -54	55.95	7	0.76
14	61.9 -58	59.95	4	0.43

15	65.9 -62	63.95	1	0.11
	<b>Total</b>		<b>921</b>	<b>100</b>

Appendix 4.2: Regeneration status of identified trees in the study area

Appendix 4.3 Percentages (%) of land cover classes in 1995

Appendix 4.4: Percentages (%) of land cover classes in 2008