Community Based Participatory Watershed Development

19/02/2007 14:00 - 15:30

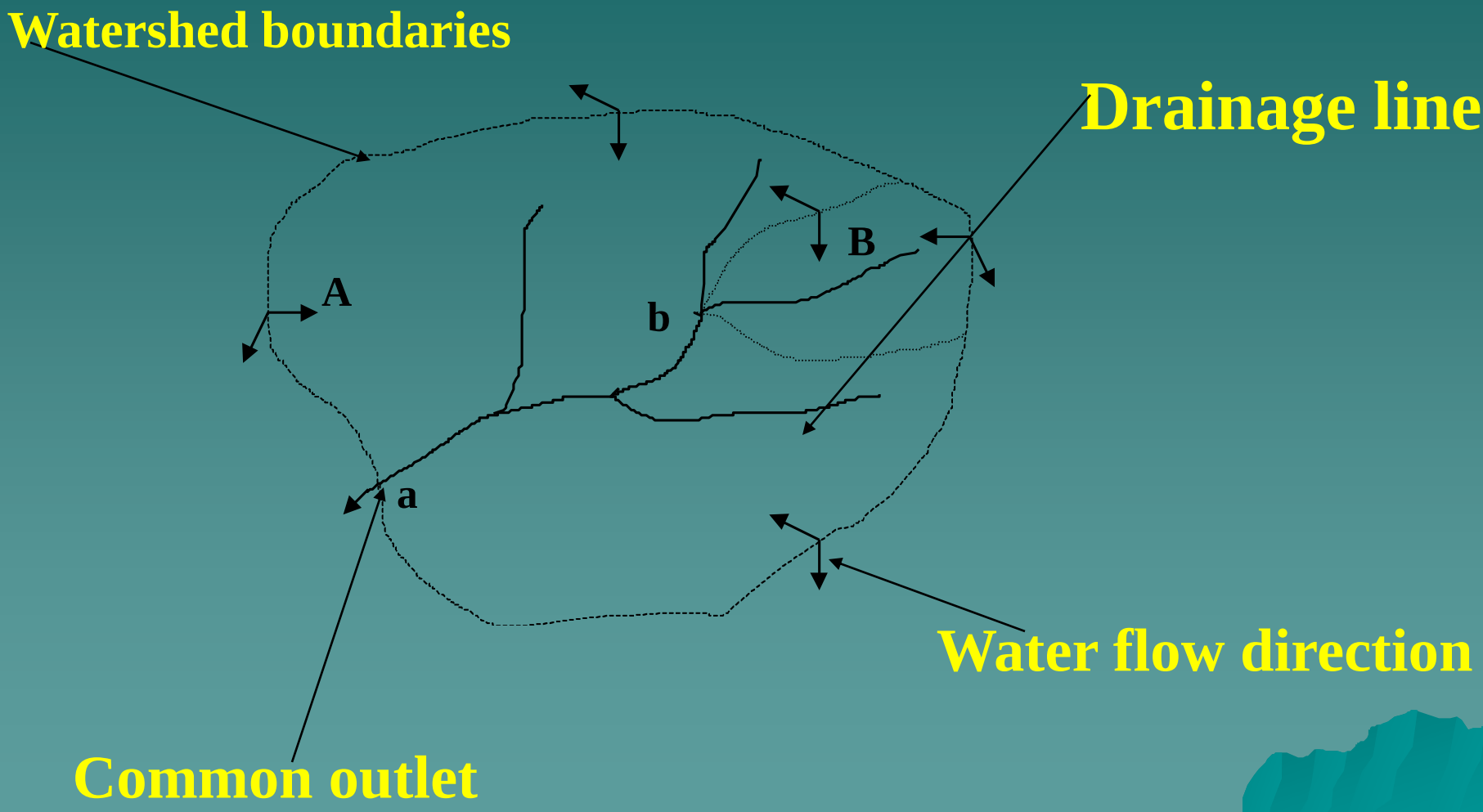
Outline of Presentation

1. CBPWD - Guideline
2. Challenges
3. Best Practices
4. Watershed Development Planning

1. Concepts of Watershed Development

A) Watershed: is defined as any surface area from which runoff resulting from rainfall is collected and drained through a common confluence point. The term watershed is synonymous with a drainage basin or catchment area

A Watershed Unit

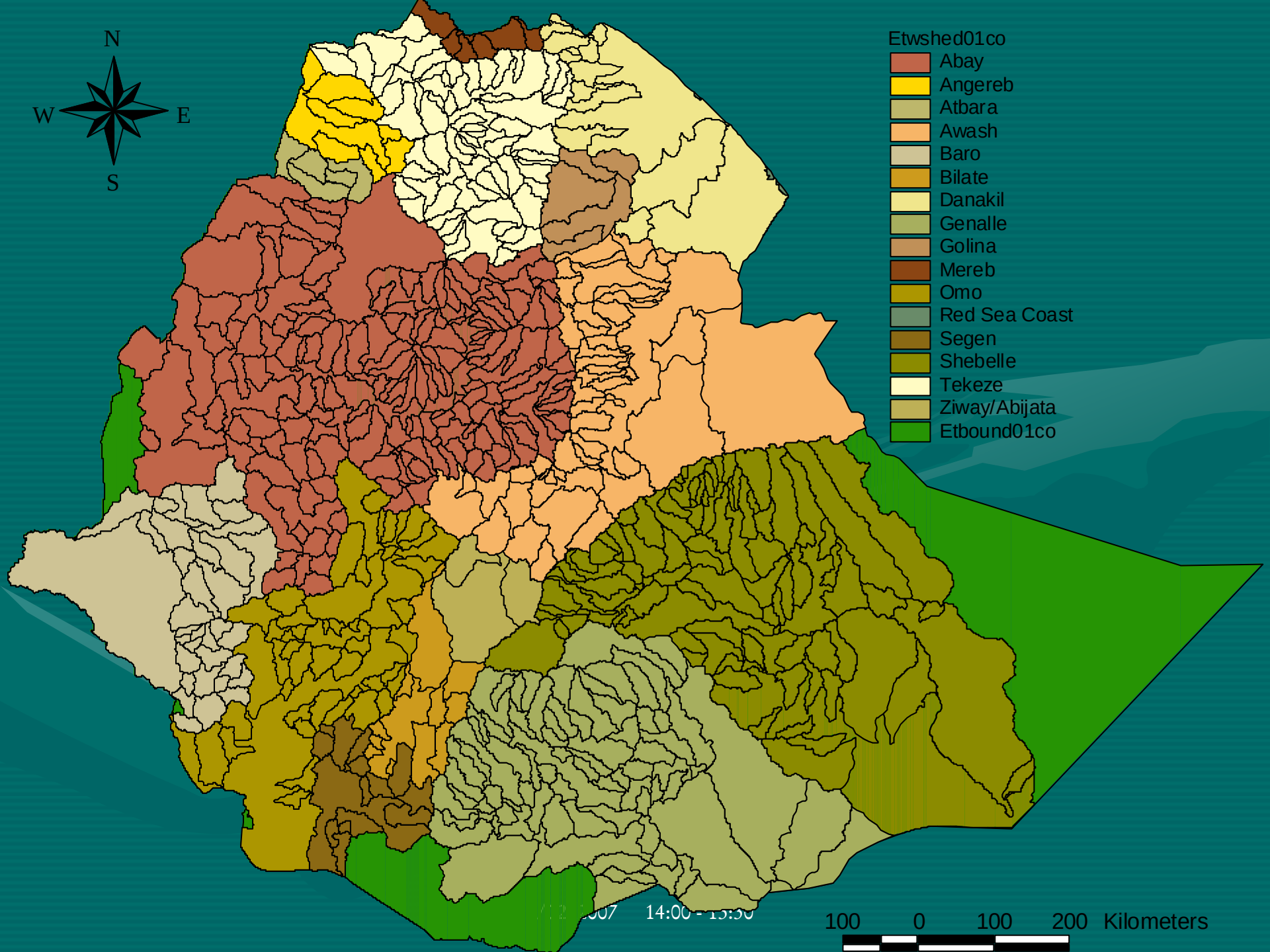


A WATERSHED COULD START FROM SMALL GULLY

19/02/2007 14:00 - 15:30

B) **Watershed Development:** can be defined as the **rational utilization** of all the natural resources for optimum production to fulfill the present need with minimal degradation of natural resources such as land, water, and environment.

Kassala
Asmara
ERITREA
Sana
YEMEN
Al Hudaydah
Wad Medani
Ad Duwaym
Gedaref
Mekele
Gonder
Lake Tana
Bahir Dar
Aden
DANAKIL DEPRESSION
DJIBOUTI
Djibouti
Dese
Berbera
ETHIOPIA
Malakal
Dire Dawa
Harer
Hargeisa
Burao
Addis Ababa
DOOXO NUG
Dembi Dolo
Nazret
Gore
Asela
OGADEN
Jima
ETHIOPIAN PLATEAU
Kebri Dehar
Galcaio
AUDO RANGE
SOMALIA
Genale River
Juba
Dawa River
Beledweyne
Mega
CHALBI DESERT
Moyale
KENYA
Lodwar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W
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Abay
Angereb
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Awash
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Danakil
Genalle
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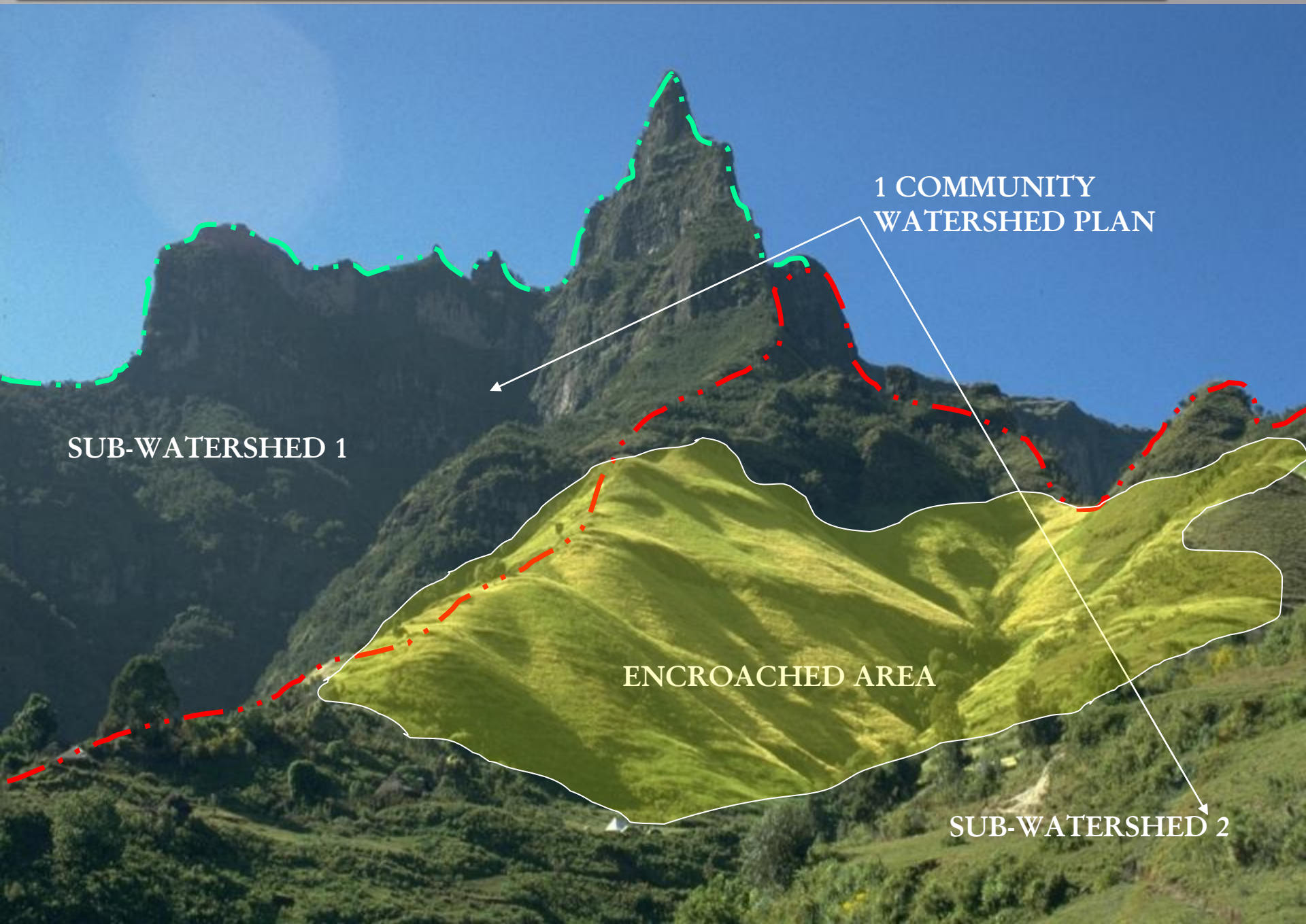
Mereb
Omo
Red Sea Coast
Segen
Shebelle
Tekeze
Ziway/Abijata
Etbound01co
14:00 - 15:30
100 0 100 200 Kilometers

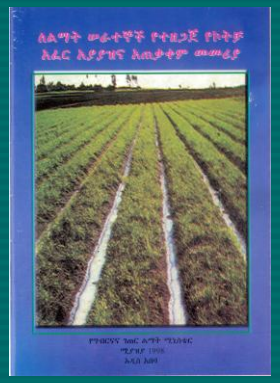
Problems – in Waterersheds

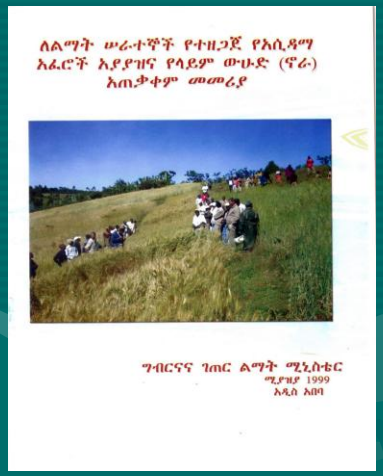
Most rivers are transboundary

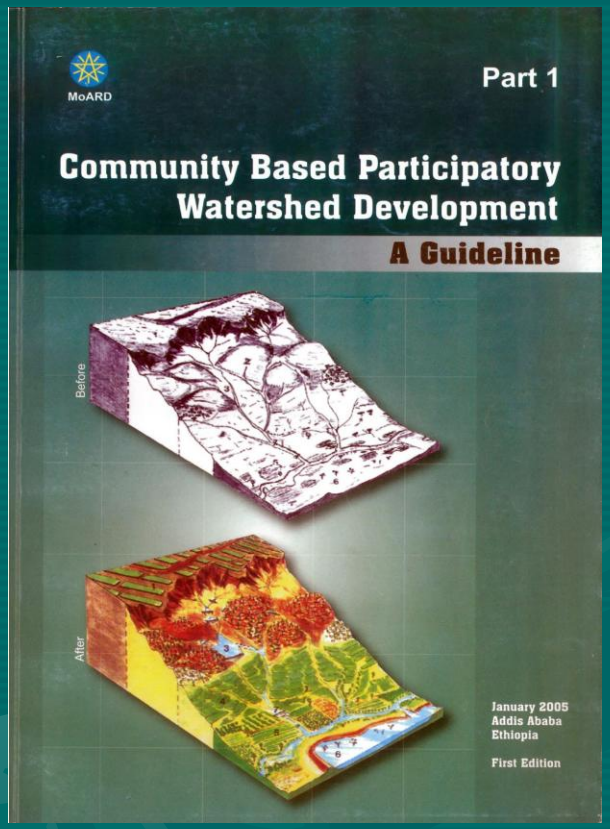
WATERSHED DEVELOPMENT KEY IN COMPLEX LANDSCAPES

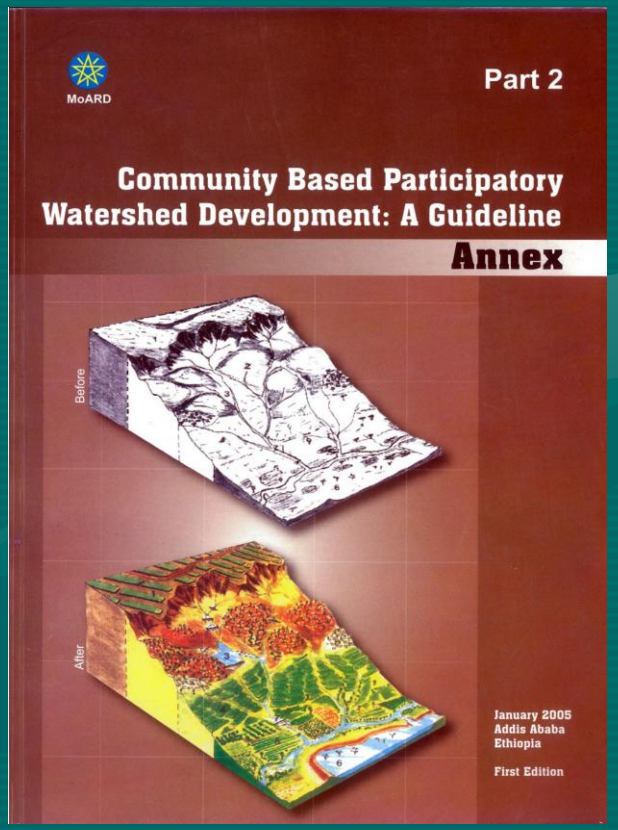


Preparation and Distribution of SLM Related Manuals and Conduct Trainings









c) Participatory watershed development: people's needs and aspirations drives planning process

- Land owners
- Landless
- Involvement of people in
  - Planning
  - Implementation
  - Monitoring and Evaluation
  - Joint decision making
  - Make changes if necessary
- Full participation of men and women
- Multi-disciplinary and multi-institutional approach
- Multiple interventions

Why Watersheds?

- Physically, they are easy to define, and are a unit that can be replicated
- Their development incorporates all of the programs, resources, and regulatory tools available to protect ecosystem and human health within a catchment
- Watershed development is successful only when the economic welfare of the watershed stakeholders is being improved, thus....
- Watershed development and economic development go hand-in-hand.
- COMMUNITIES NEED GOVERN THE DEVELOPMENT AGENDA

2. Main Principles of watershed development

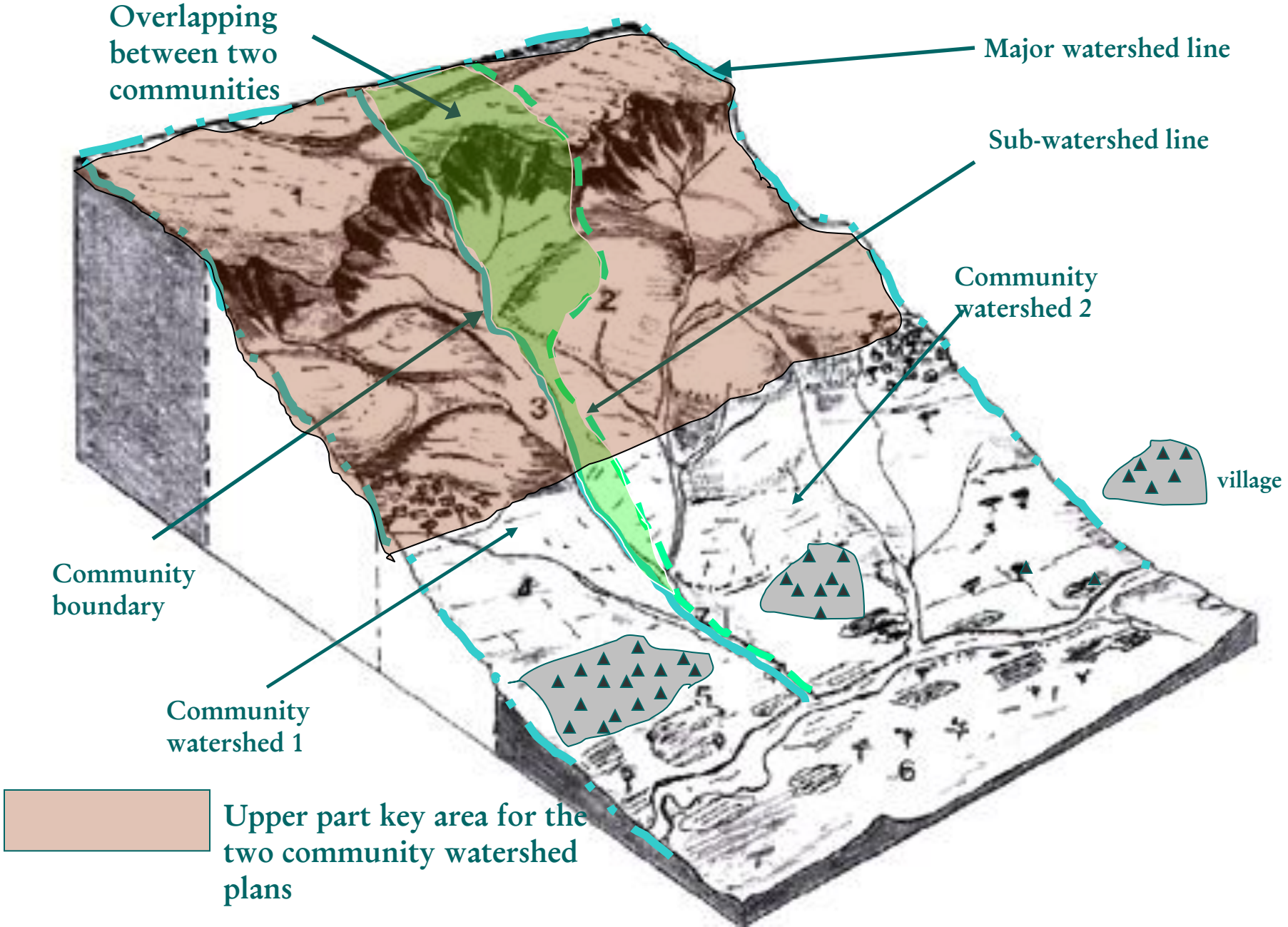
- Participatory
- Gender sensitive
- Building upon local experience and strength
- Realistic, Integrated, Productive, Manageable
- Watershed logic respected – Ridge to valley
- Cost sharing/empowerment/ownership building
- Complementary to food security and rural devt.

3. Size of the watershed

- Size as function of potential and diversity
- Diverse development potential tend to be smaller
- In drier or pastoral areas may tend to be larger
- Size can vary depending on single or multiple interventions
- Effective planning needs a suitable watershed size
- If large difficult to organize the community
- If large difficult to undertake surveying, planning, implementing, and monitoring tasks at one go
- Decision-making unit for any watershed is the community
- Starting point for planning is the community and its surroundings

Suggested size is from 200 to 500ha

Community watershed relationships – Example



4. Three scenarios exist with respect to watershed vis a vis community size:

4.1 Watershed boundary coincides with community boundary – ok

4.2 Watershed boundary is greater than community boundary - include more communities

4.3 Watershed boundary is smaller than community boundary – include only a portion of a community

6. Components of watershed: overview

6.1 Biophysical (water, land, vegetation)

6.2 Socioeconomic (population, farming systems, social setups, economic activities, vulnerability profile, gender, etc.)

6.3 Watershed degradation features

- 6.3.1 Depletion of water resources
- 6.3.2 Soil erosion and land degradation
- 6.3.3 Impoverishment of the vegetative cover
- 6.3.4 Damage to Infrastructure

7. Existing and untapped potentials for optimizing use of water and soil in a watershed

7.1 Water harvesting opportunities
7.2 Land rehabilitation and reclamation
7.3 Protection, development and sustainable management of forests
7.3 Sustained, long lasting and effective use of rural infrastructure
7.4 Promotion of income generation activities
7.5 Watershed development and conflict resolution

Community Based Participatory Watershed Development Guideline

Main objective:

1. Effective and common approach to community based planning for NR development and productivity intensification,
2. Selection and implementation of suitable technologies under different agro-ecological conditions and their sequentially correct implementation
3. Identify untapped and/or under-estimated potentials in watersheds
4. Reference material for TVET Colleges and FTCs

Components:

PART 1: Community-based Participatory Watershed Planning Guideline

. Section (A): Scope and Planning Procedures for PWD

. Section (B): Information Kits on Technologies for PWD

PART 2: Annexes – 9 annexes

PWD GUIDELINE DESCRIPTION:

PART 1: Community-based Participatory Watershed Planning Guideline

Section (A): Scope and Planning Procedures

Scope:

- Introduction
- Rationale and objectives
- Enabling policies and strategies
- Definitions
- Concepts and principles of PWDP
- Components of watershed (Biophysical, socio-economic)
- Size of watershed 200 – 500 ha

Procedures and Steps:

STEP 1 Getting started at district/project level: Prioritization and selection of watersheds

STEP 2 Getting started at community level (CWTs)

STEP 3 Biophysical and socio-economic survey

STEP 4 Identification and prioritization of interventions that bring change

STEP 5 Getting the options and interventions discussed and approved by the General Assembly

STEP 6 Development map, inputs and action plan

STEP 7 Implementation strategy

STEP 8 Participatory Monitoring and Evaluation

Procedures

- Procedure 1: Do the trend analysis exercise
- Procedure 2: Do the Village Mapping exercise and presentation
- Procedure 3: Conduct the Transect Walk exercise and presentation (the group will make presentation)
- Procedure 4: Do the Institutional Analysis
- Procedure 5: Do vision of change exercise
- Procedure 6: Conduct the Problem Identification and Ranking exercise
- Procedure 7: Collect additional information using the questioner (Annex 9) and secondary data

District level staff composition

The CORE group will include:

- 1 Soil Conservation Expert
- 1 Forestry / Agro-forestry Expert
- 1 Agronomist (plant management, IPM)
- 1 Water harvesting / Irrigation Expert
- 1 Livestock Expert
- 1 Food security Expert (Economist, Socio-economist, Agricultural Economist)
- 1 Home Agent
- 1 Land Use and Administration Expert
- 1 Cooperative / Marketing and Inputs Expert
- 1 Rural Road Construction Expert

Composition at the Community/Sector level

The Location/sublocation composition will include:

- Chairman
- Secretary
- The DA (s)
- One male representative/leader of each community
- One female representative/leader of each community (village)
- Respected and influential persons
- Representative of the Youth

Information Kits on Technologies - Section (B)

I) Main description and features

II) Type of Infotechs

1. Physical SWC (8)
2. Flood Control and Drainage (5)
3. Rainwater/Runoff Harvesting (20)
4. Soil Fertility Management and Biological Soil Conservation (12)
5. Agroforestry, Forestry and Forage Development (9)
6. Gully Control (5)
7. Feeder Roads (8)

PART 2: ANNEXES

Annex 1 Participatory mapping and understanding of the target area

Annex 2 Participatory planning and socio-economic survey

Annex 3 Biophysical survey and mapping

Annex 4 Simple survey methods

Annex 5 Interventions and their suitability

Annex 6 Summary of national work norms

Annex 7 List of Useful Plant Species

Annex 8 Community-based solidarity efforts

Annex 9 Planning formats – samples

Mode of Guideline Preparation

- A steering/technical committee established
- All active stakeholders in PWDP have been invited in first draft preparation for 7 days workshop.
- MoARD, GTZ, WFP, USAID (AMAREW), ILRI, Provincial offices have contributed.
- Translation into 3 national languages and printing of 60,000 copies.
- Funding by USAID and WFP.
- ToT for District level experts followed by DAs and communities -Training Module
- Streamlining to NGOs
- Community plans were then prepared and are under implementation

Given challenges and examples of bad practices

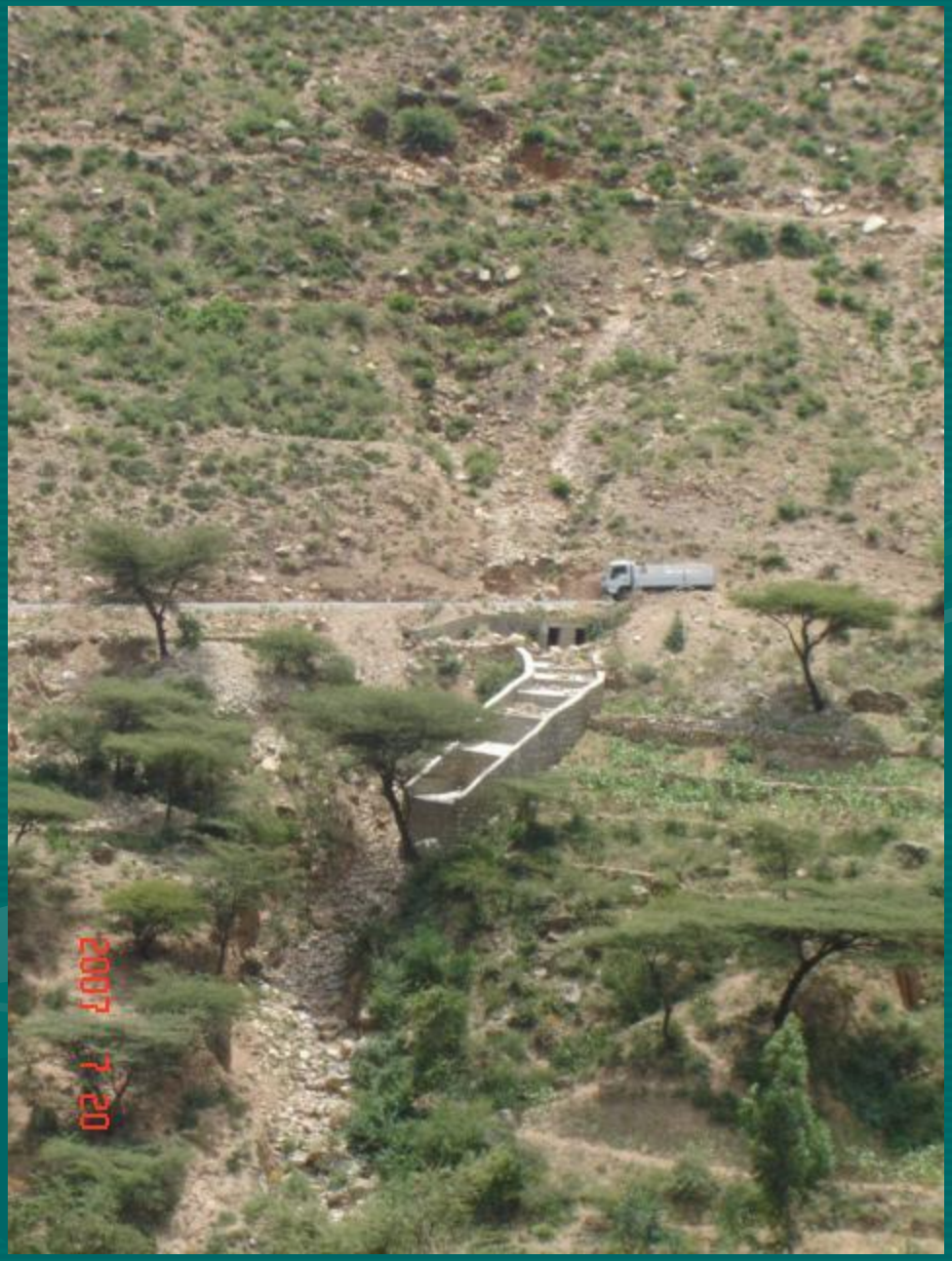
Hillside cleared of vegetation for fuelwood and income source by the poor – Shayi area

Clearing hillsides for charcoal production – on the road from Bishan Behe to Kalicha

Gully created as a result of the culvert – in Dhangego KA of Kersa

Gully from the culvert eating perennial crops (chat) in Dhangego KA of Kersa

Culvert not extended to the natural waterway – in Harla Belina KA




Gully created
from foot path
and cattle
trafficking lines –
Gende Boru

Gully form foot path and cattle trafficking lines – Gende Boru

Sisal plantings not being able to withstand gully erosion – Gende Goro Seka

Wasted land in Awale area

Cultivation of steep slope and formation of rills - Awale area

A living testimony of past erosion levels >5m– near Harla

A living testimony of past erosion levels – near Harla

Poor terrace construction and absence of maintenance G. Borte

Farmers are forced to grow crops on coarse sand and gravely soils – G. Oda

Non functional community water points – G. Goro Seka

Not properly constructed HH WH (pond) with geo-membrane lining G. Goro Seka continued...

Developed spring collection chamber and takeoff is destroyed by flood – Lege Biyo in G. Oda

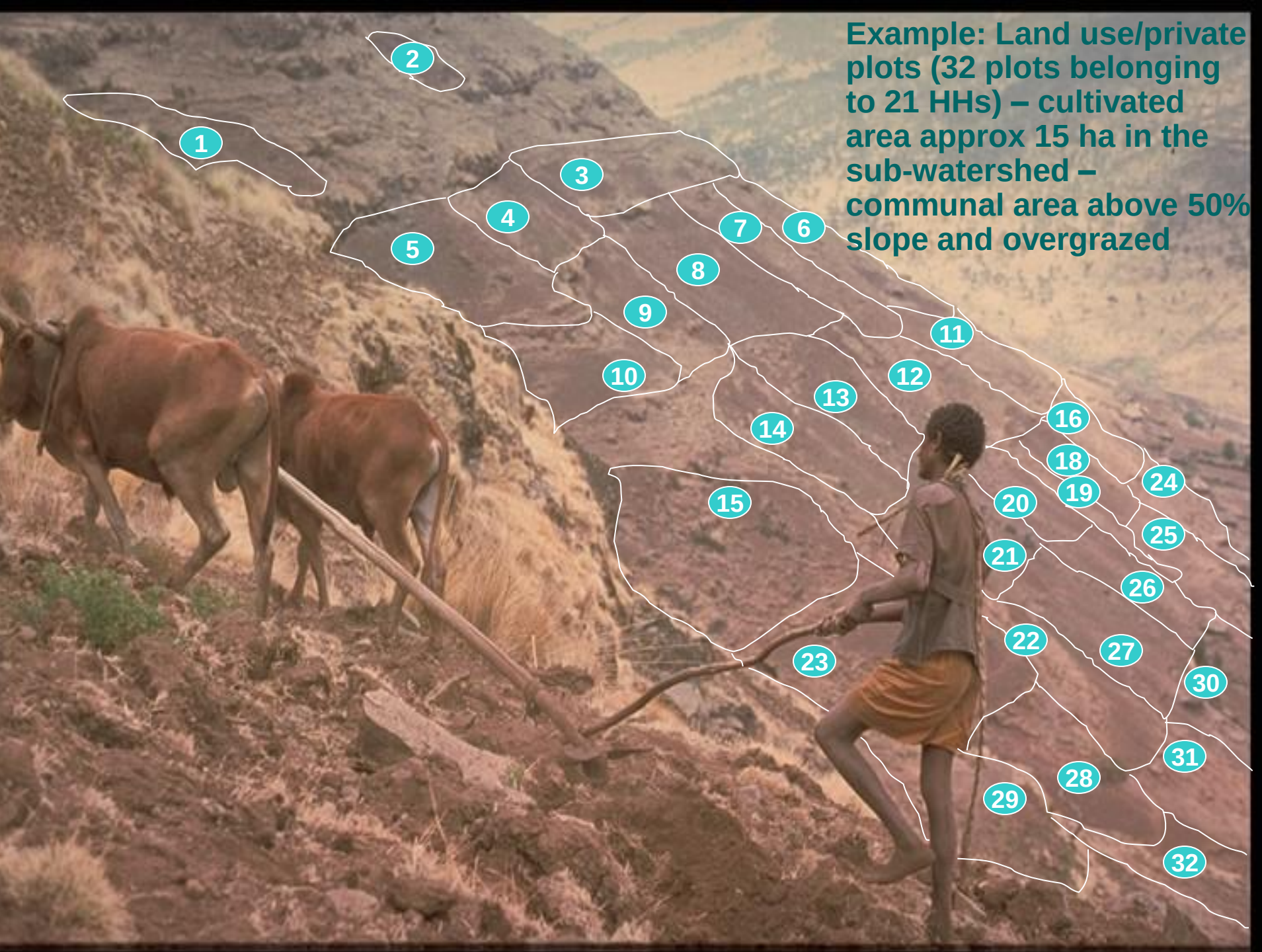
Water supply pipe line taken away by flooding – L. Ejeru in G. Ejeru

A family/HH in a challenging environment - Ejeru

Survival needs and lack of opportunities: you will need to deal with many of these critical situations

Cultivation of extreme slopes


>50% slope
30-50% slope
25-30% slope


Example: Land use/private plots (32 plots belonging to 21 HHs) – cultivated area approx 15 ha in the sub-watershed – communal area above 50% slope and overgrazed
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32

BROKENA EARTH DAM

Gully acting as moisture suction from the soil in deeper profiles

Gully and degradation


Steep slope cultivation without conservation

Poor plastic lining

Examples of Best Practices


04/10/2003 13:22:12

Dugout Ponds Design Considerations

Site Selection; Lining Requirement

Geo-membrane Lining

Needs proper placement


03/10/2003 18:02:31

Drained water is stored for later use

Drained water is stored for later use

Goregutu wereda subwatershed

WATER HARVESTING

Hemi-spherical tanks

Circular tanks for WH

Hand-dug well

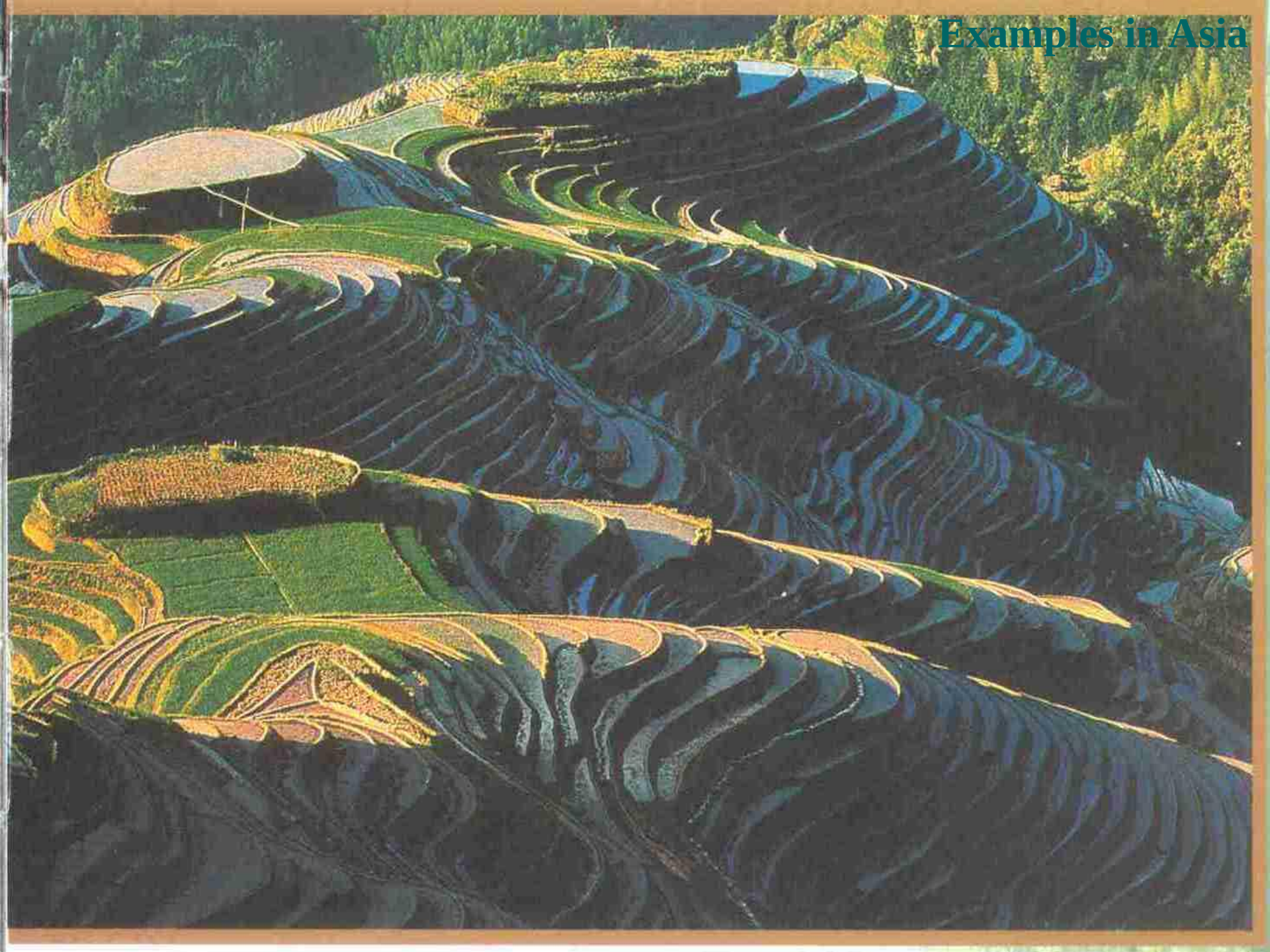
Dome capped WH structure

Benefits from WH and SSI - Vegetables, Fruits and Forages

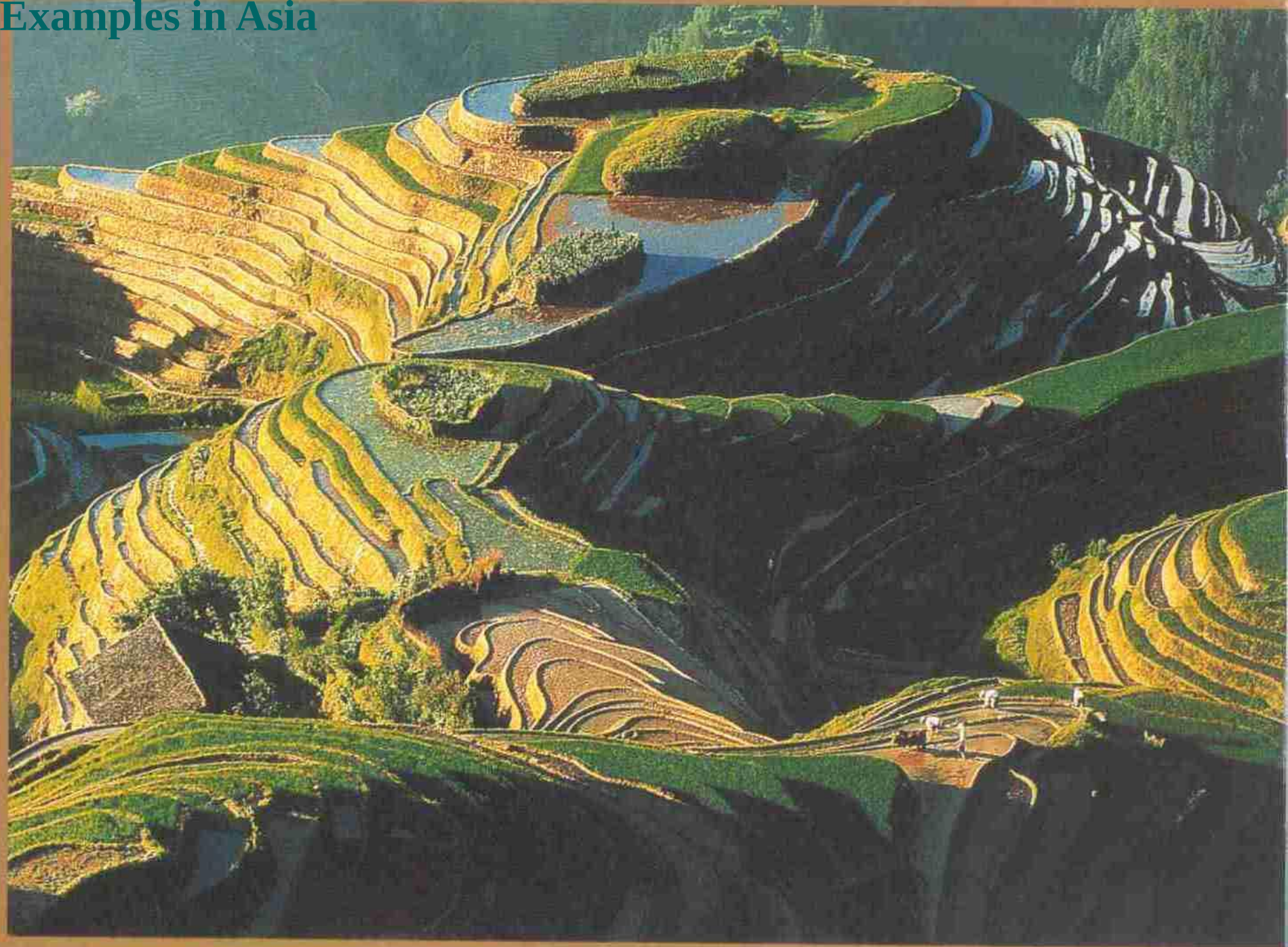
Technologies on small scale irrigation

Apple production at Homestead

Examples in Asia



Examples in Asia



Terraces in RWH - Asia


Rainwater collection

Area closure, natural regeneration and terracing of the foot slopes for cultivating crops – on the road side from Eje Aneni to Awale

Mechelo or *Haika saligna* a riverside plant for gully and waterway stabilization – G. Goro Seka/G. Boru

Foot path side plantings with *Euphorbia tirucalli* G. Oda


Contour farming with Ch
– Dhangago KA of Kersa

Contour plantings of Chat – near L. Gogeti as one goes to Adada

More closer look to the stone terraces near Harla, note the height

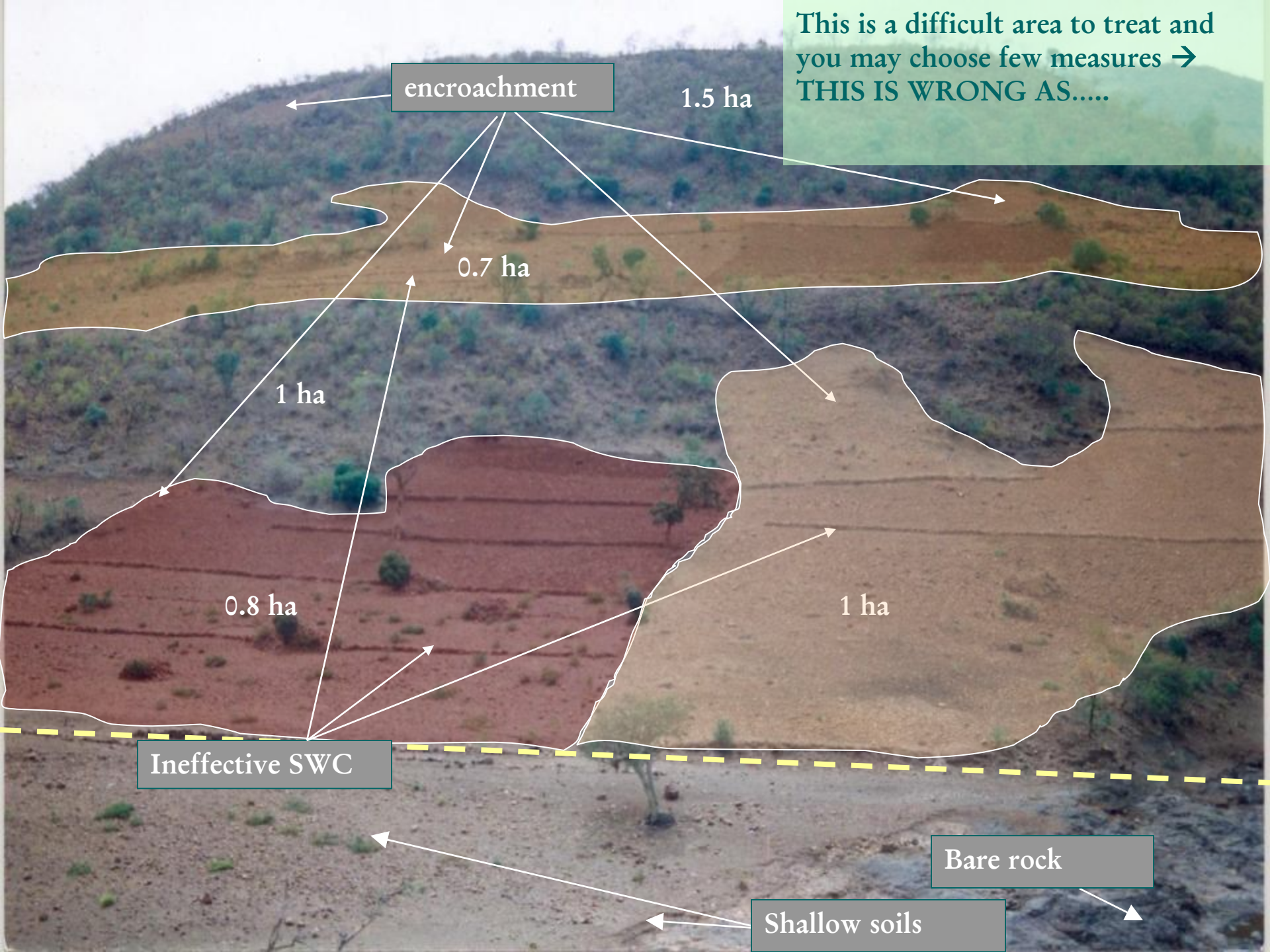
Another more closer look to the stone terraces near Harla

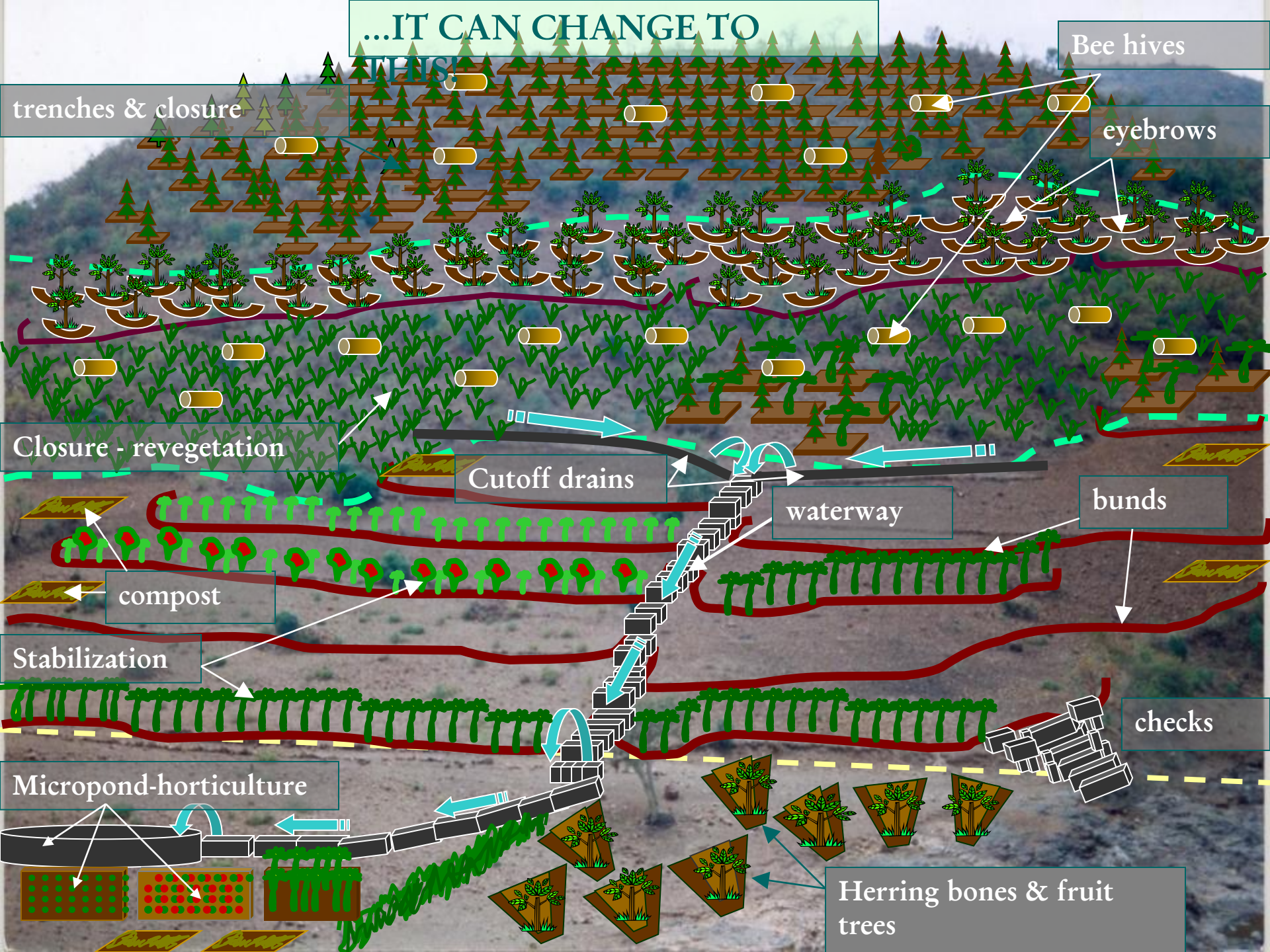
Cultivation along the cricks with stone faced bench terraces – on the road from Bishan Behe to Belewa

Runoff diversion and canal in L. Ejeru

Example: Some changes appear impossible but most of the time this is proven wrong

- Sub-unit of cultivated land below encroached communally overgrazed land – 5 hectares
- All slopes < 50% gradient and severe erosion
- 3 households cultivating the area


This is a difficult area to treat and you may choose few measures →
THIS IS WRONG AS.....
encroachment
1.5 ha
0.7 ha
1 ha
0.8 ha
1 ha
Ineffective SWC
Bare rock
Shallow soils


...IT CAN CHANGE TO
THIS!
trenches & closure
Bee hives
eyebrows
Closure - revegetation
Cutoff drains
waterway
bunds
compost
Stabilization
checks
Micropond-horticulture
Herring bones & fruit trees

Examples in Ethiopia

Watershed Development Planning

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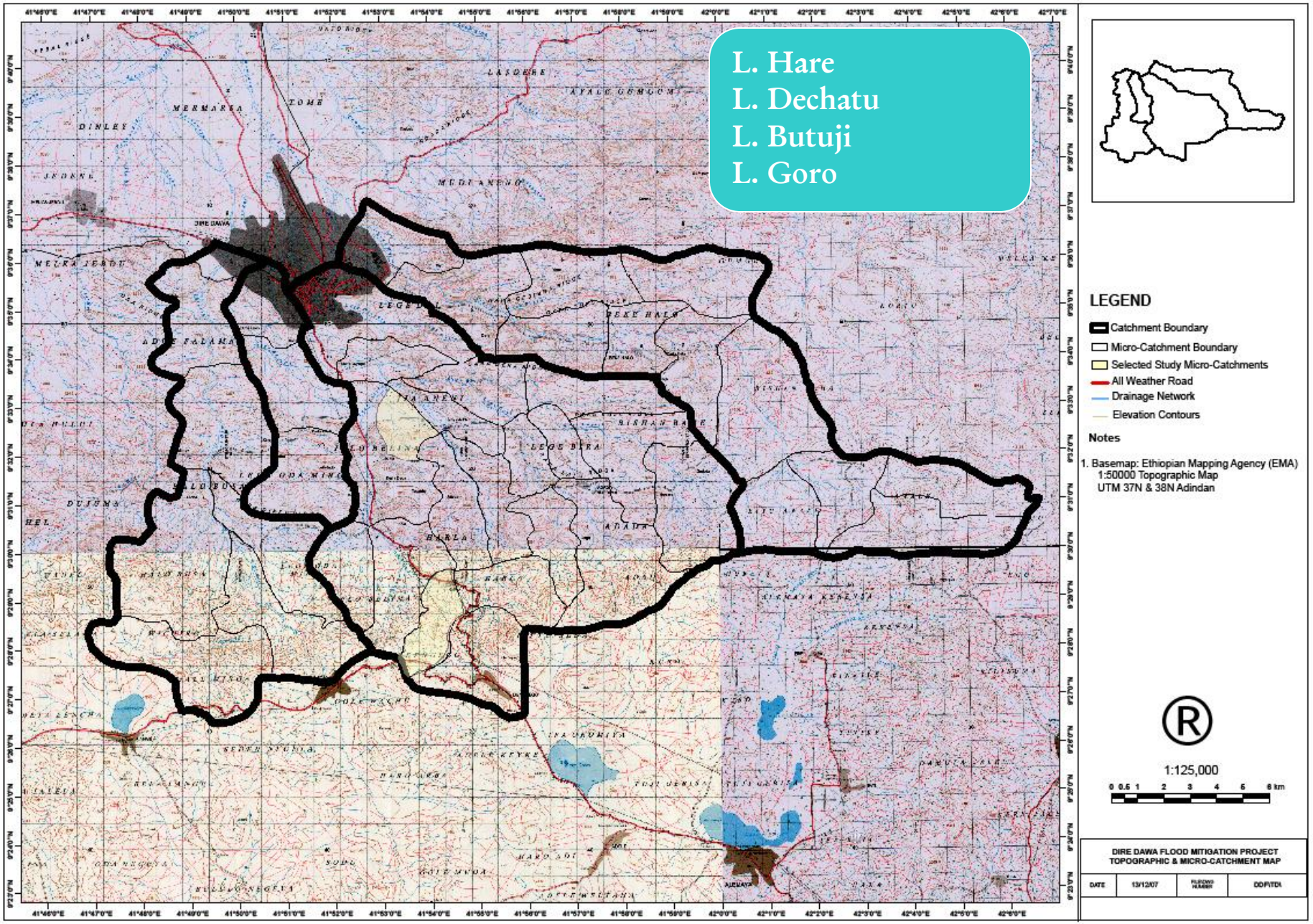
L. Hare
L. Dechatu
L. Butuji
L. Goro
LEGEND
Catchment Boundary
Micro-Catchment Boundary
Selected Study Micro-Catchments
All Weather Road
Drainage Network
Elevation Contours
Notes
1. Basemap: Ethiopian Mapping Agency (EMA)
1:50000 Topographic Map
UTM 37N & 38N Adindan
1:125,000
0 0.5 1 2 3 4 5 6 km
DIRE DAWA FLOOD MITIGATION PROJECT
TOPOGRAPHIC & MICRO-CATCHMENT MAP
DATE
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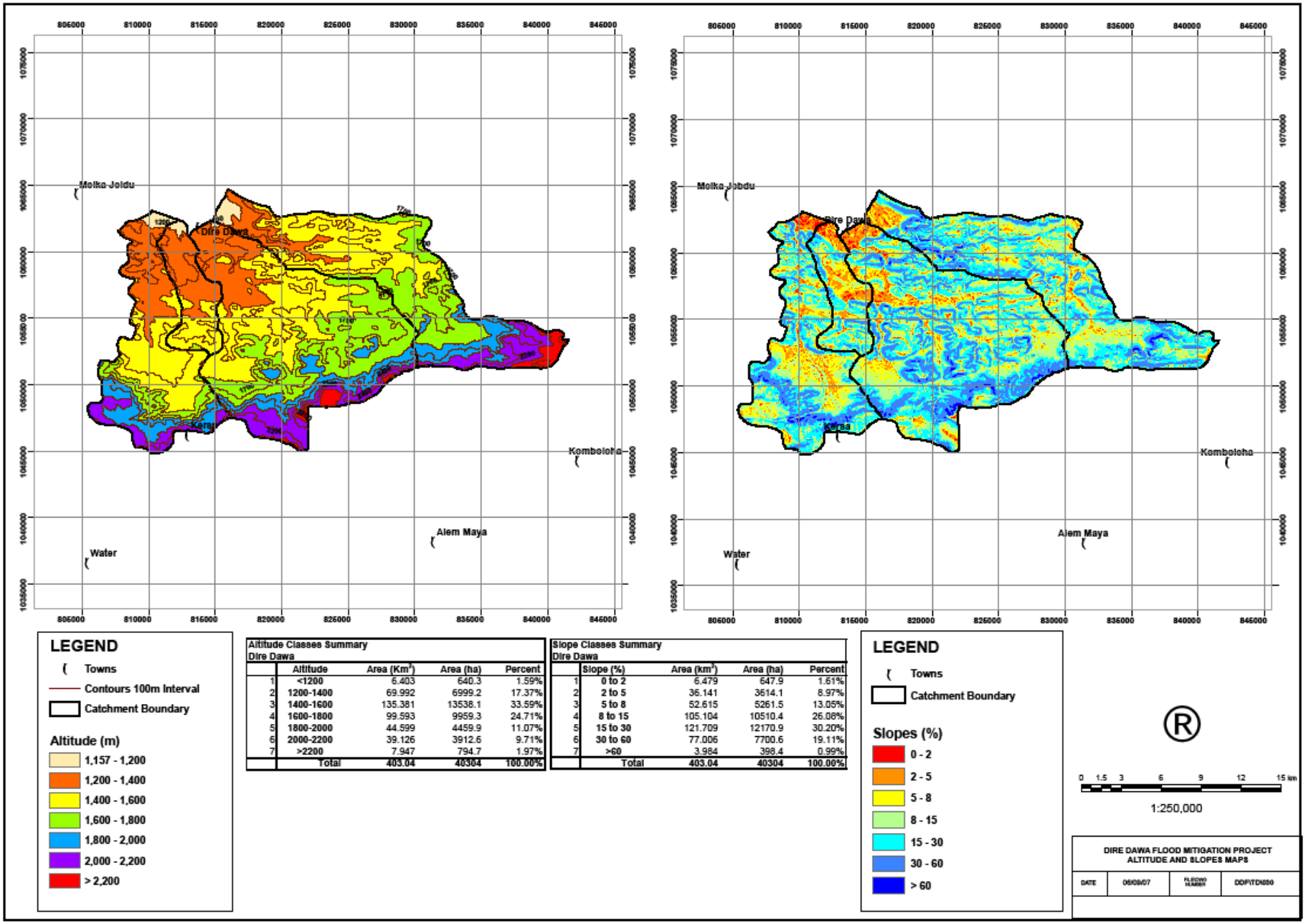

Altitude Classes Summary
Dire Dawa

	Altitude	Area (Km²)	Area (ha)	Percent
1	<1200	6.403	640.3	1.59%
2	1200-1400	69.992	6999.2	17.37%
3	1400-1600	135.381	13538.1	33.59%
4	1600-1800	99.593	9959.3	24.71%
5	1800-2000	44.599	4459.9	11.07%
6	2000-2200	39.126	3912.6	9.71%
7	>2200	7.947	794.7	1.97%
	Total	403.04	40304	100.00%

Slope Classes Summary
Dire Dawa

	Slope (%)	Area (km²)	Area (ha)	Percent
1	0 to 2	6.479	647.9	1.61%
2	2 to 5	36.141	3614.1	8.97%
3	5 to 8	52.615	5261.5	13.05%
4	8 to 15	105.104	10510.4	26.08%
5	15 to 30	121.709	12170.9	30.20%
6	30 to 60	77.006	7700.6	19.11%
7	>60	3.984	398.4	0.99%
	Total	403.04	40304	100.00%

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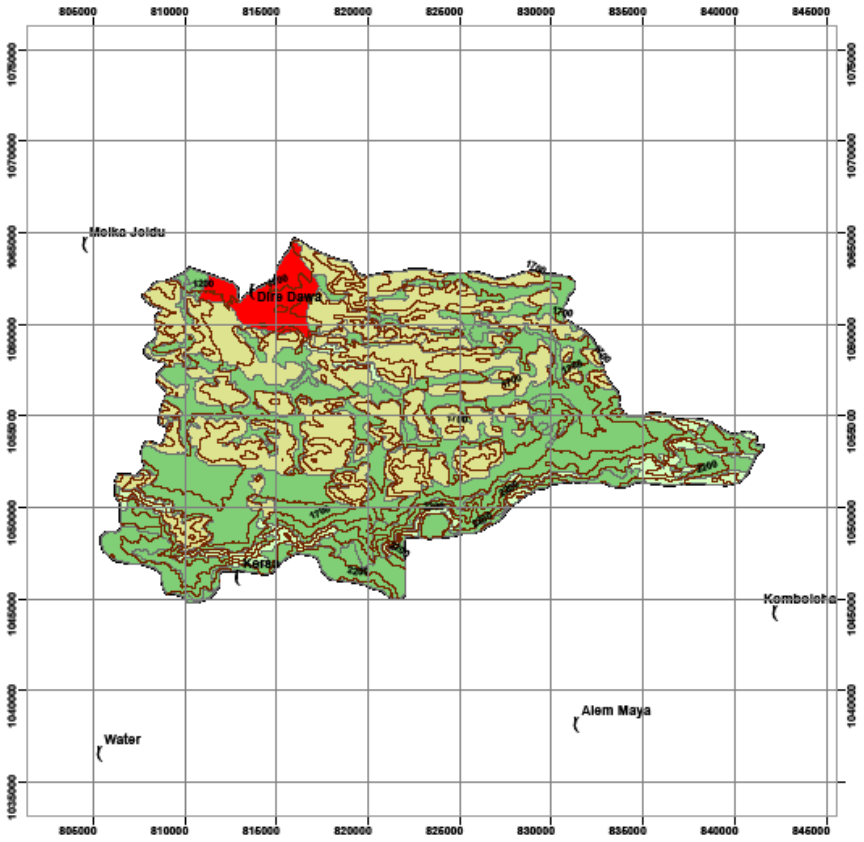
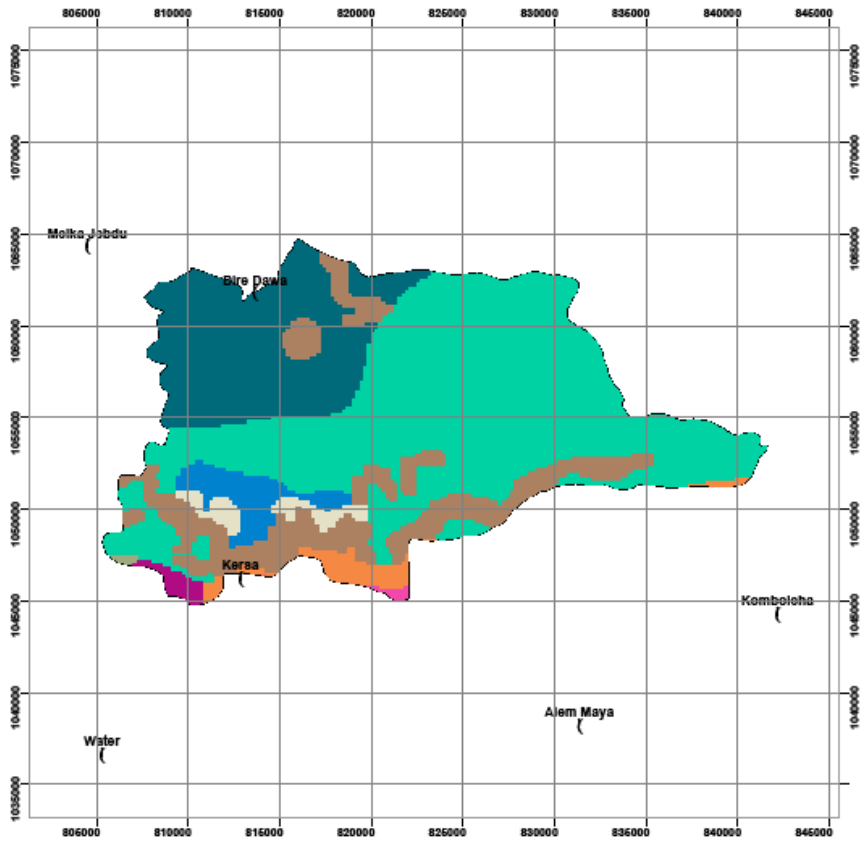




LEGEND

- Towns
- Catchment Boundary

Major Classes

- Bare Land
- Cultivated Land
- Physiognomic Vegetation
- Urban

Major Landuse/Land Cover Classes Summary

	Major Classes	Area (km^2)	Area (ha)	Area (%)
1	Bare land	160.37	16037.09	39.79%
2	Cultivated land	205.50	20550.07	50.99%
3	Physiognomic vegetation	22.00	2200.50	5.46%
4	Urban	15.18	1517.64	3.77%
	Total	403.05	40305	100.00%

Soil Types & Area Summary

	Soil Type	Area (km2)	Area (ha)	Area (%)
1	Calcaric Fluvisols	86.74	8674	21.52%
2	Chromic Cambisols	3.41	341	0.85%
3	Dystric Gleysols	0.69	69	0.17%
4	Dystric Nitisols	10.38	1038	2.58%
5	Gypsic Yermosols	6.76	676	1.68%
6	Haplic Xerosols	220.65	22065	54.75%
7	Leptosols	58.37	5837	14.48%
8	Orthic Solonchaks	16.04	1604	3.98%
	Total Area	403.04	40304	100.00%

LEGEND

- Towns
- Catchment Boundary

Soil Types

- Calcaric Fluvisols
- Chromic Cambisols
- Chromic Vertisols
- Dystric Gleysols
- Dystric Nitisols
- Gypsic Yermosols
- Haplic Xerosols
- Leptosols
- Orthic Solonchaks

Notes:

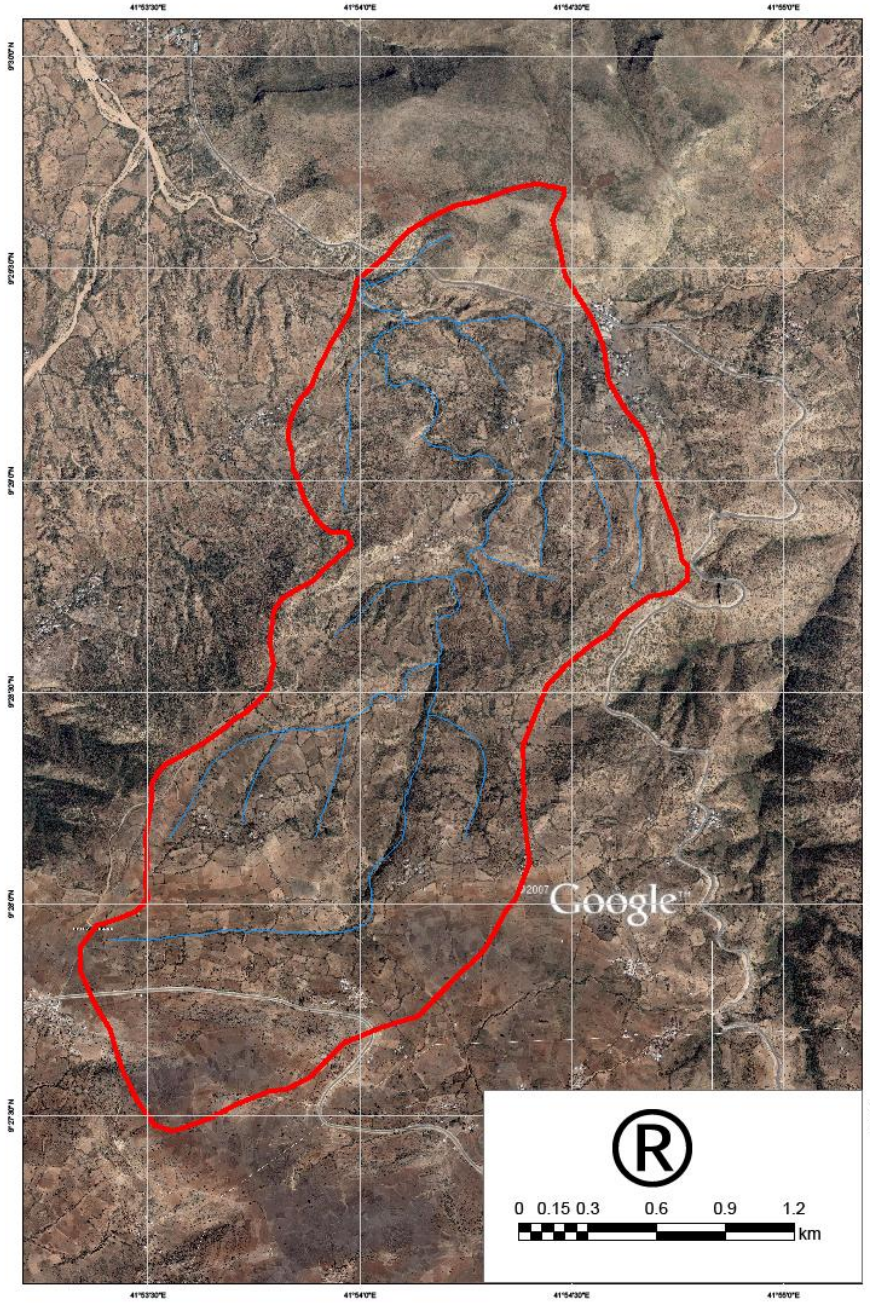
1. Soil data from EthioGIS database

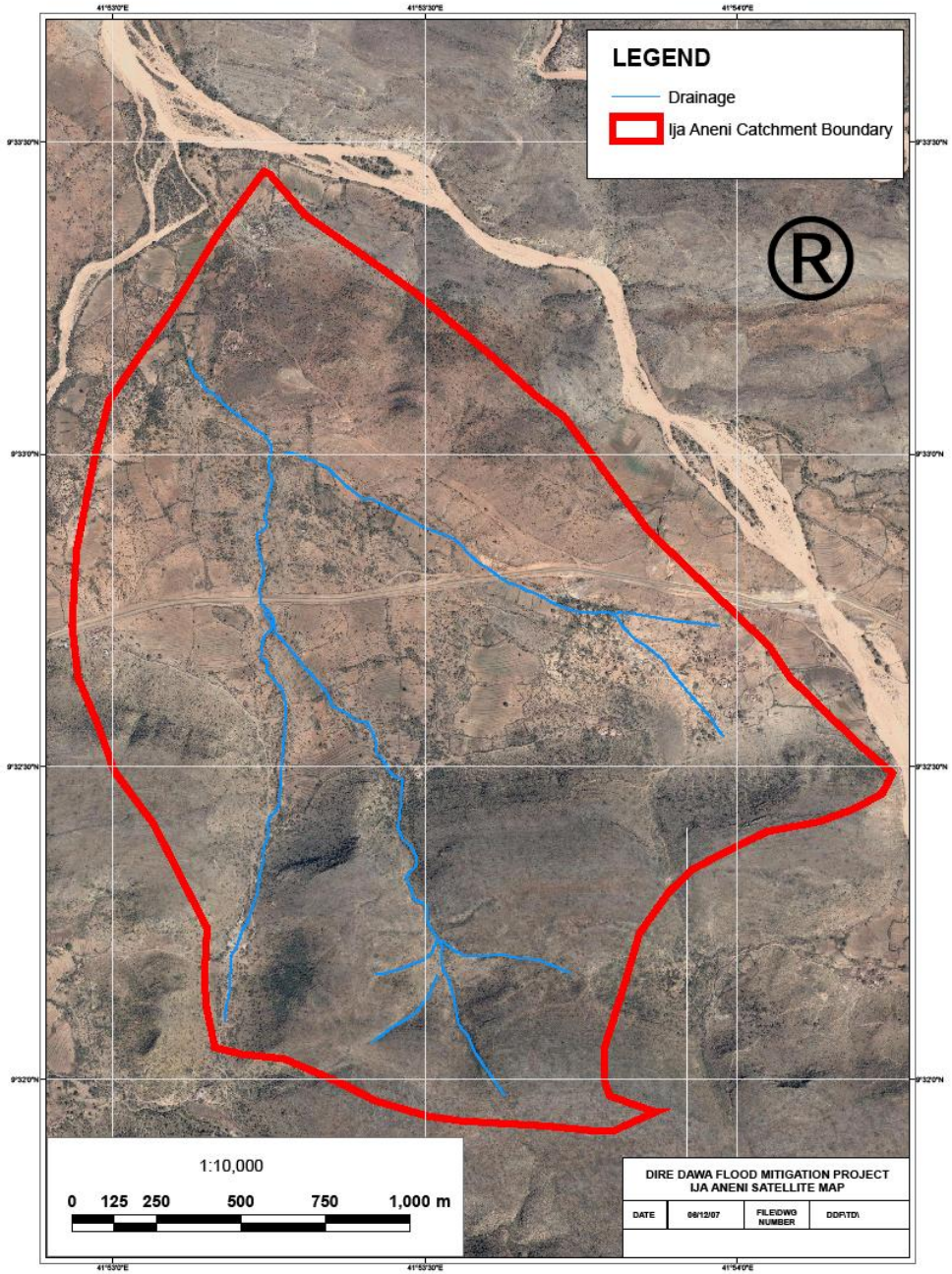
0 1.5 3 6 9 12 15 km

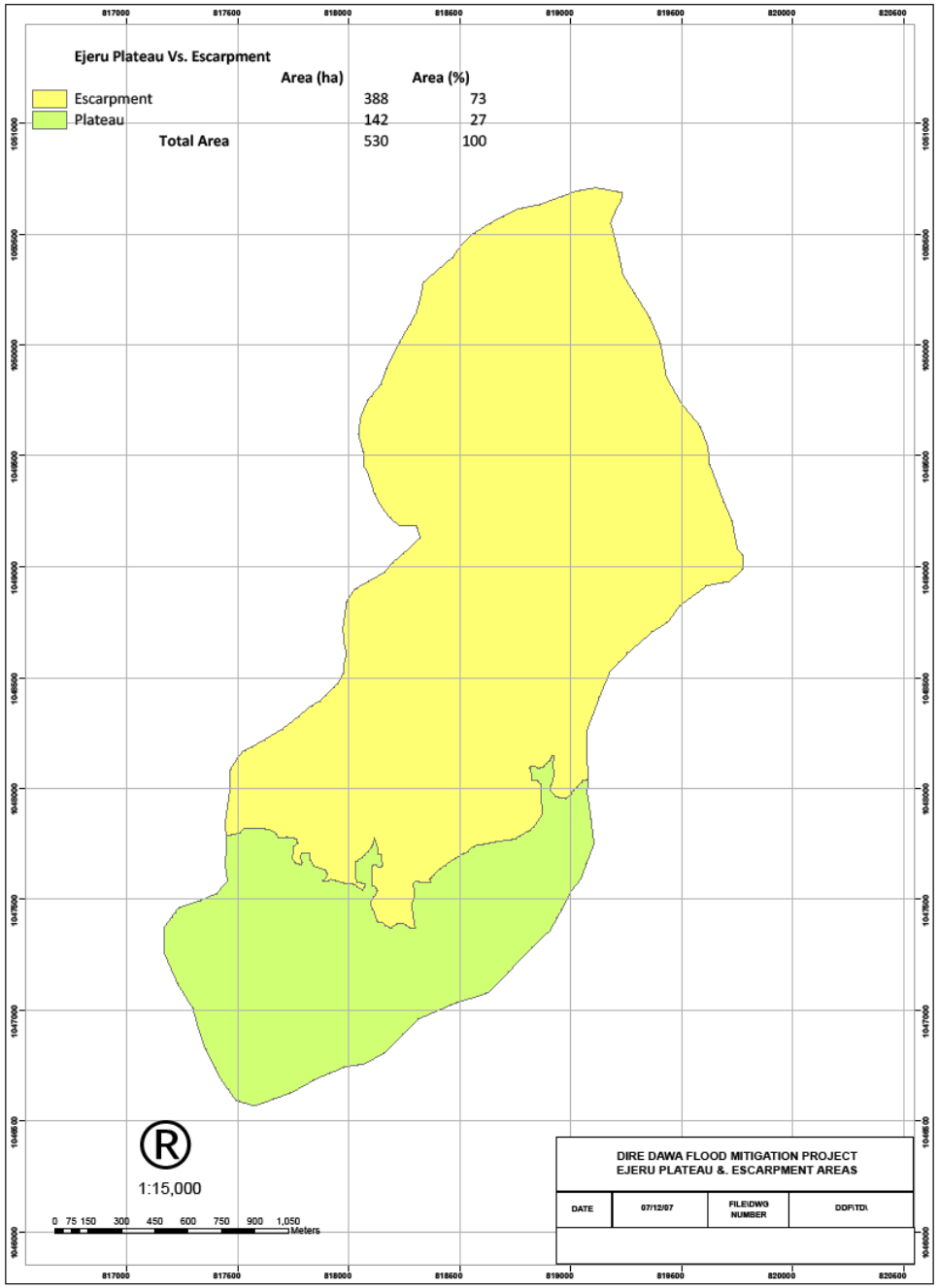
1:250,000

DIRE DAWA FLOOD MITIGATION PROJECT
LANDUSE & SOIL MAPS

DATE	05/09/07	FLEDWO NUMBER	


41°53'30"E
41°54'0"E
41°54'30"E
41°55'0"E
©2007 Google™
®
0 0.15 0.3 0.6 0.9 1.2
km


LEGEND
Drainage
Ija Aneni Catchment Boundary
R
41°53'0"E
41°53'30"E
41°54'0"E
9°33'30"N
9°33'0"N
9°32'30"N
9°32'0"N
1:10,000
0 125 250 500 750 1,000 m
DIRE DAWA FLOOD MITIGATION PROJECT
IJA ANENI SATELLITE MAP
DATE
08/12/07
FILE/DWG NUMBER
DDP\TD\


Ejeru Plateau Vs. Escarpment
Area (ha)
Area (%)
Escarpment
388
73
Plateau
142
27
Total Area
530
100
817000
817600
818000
818600
819000
819600
820000
820600
1051000
1050500
1050000
1049500
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1:15,000
0 75 150 300 450 600 750 900 1,050
Meters
DIRE DAWA FLOOD MITIGATION PROJECT
EJERU PLATEAU &. ESCARPMENT AREAS
DATE
07/12/07
FILE\DWG NUMBER
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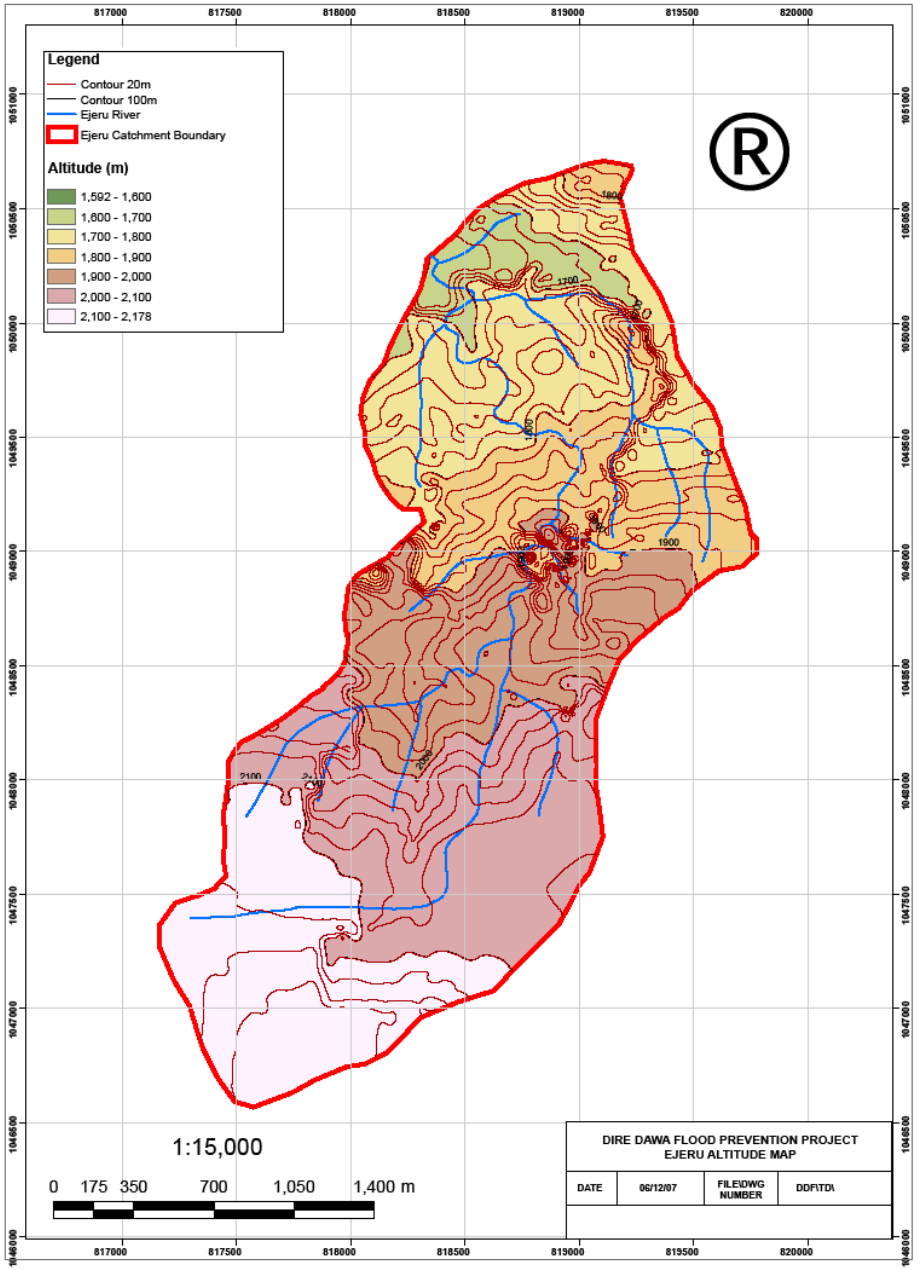
Legend
Contour 20m
Contour 100m
Ejeru River
Ejeru Catchment Boundary
Altitude (m)
1,592 - 1,600
1,600 - 1,700
1,700 - 1,800
1,800 - 1,900
1,900 - 2,000
2,000 - 2,100
2,100 - 2,178
817000
817500
818000
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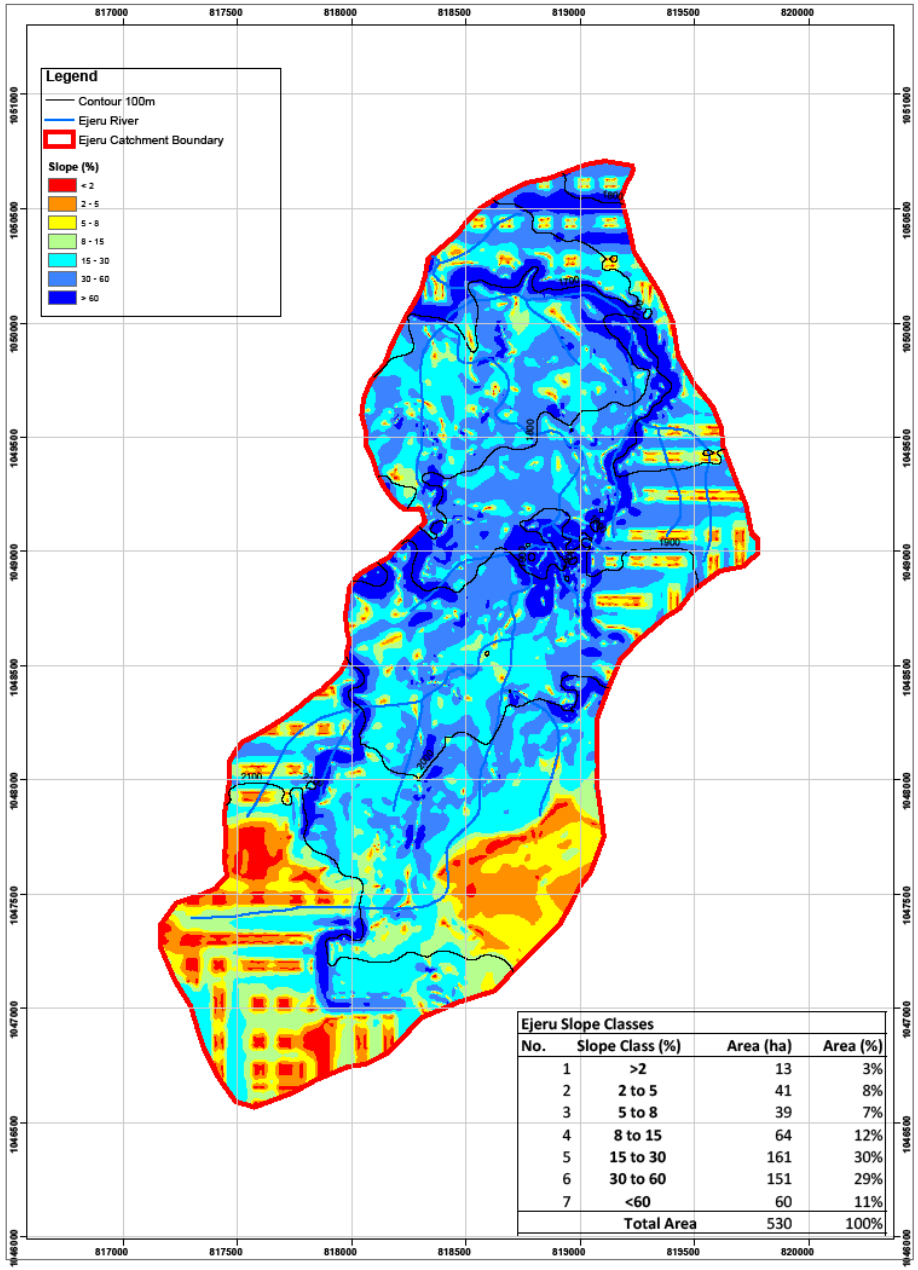
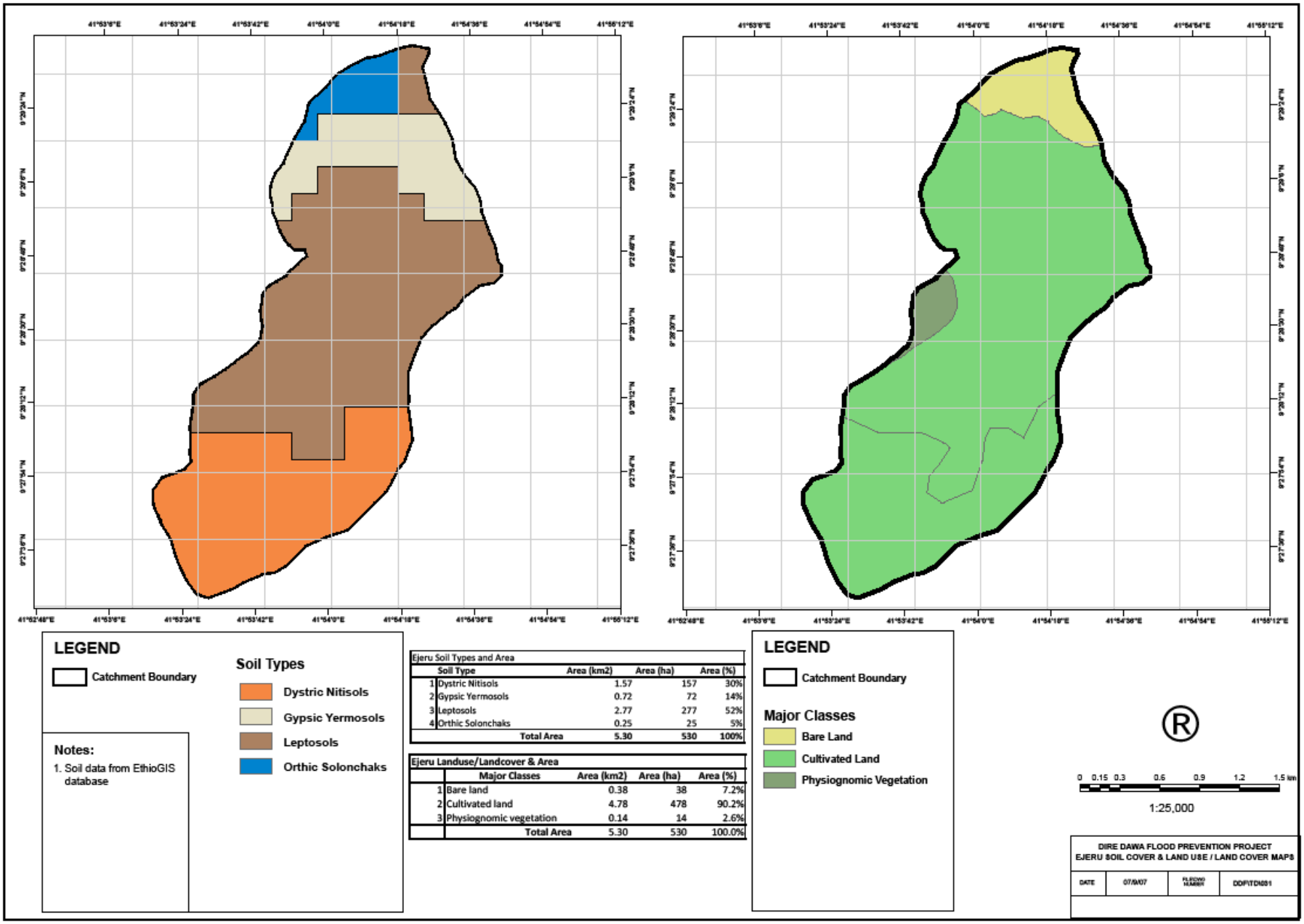
819000
819500
820000
1051000
1050500
1050000
1049500
1049000
1048500
1048000
1047500
1047000
1046500
1046000
1700
1900
2100
1:15,000
0 175 350 700 1,050 1,400 m
DIRE DAWA FLOOD PREVENTION PROJECT
EJERU ALTITUDE MAP
DATE
06/12/07
FILE\DWG NUMBER
DDF\TD\



Ejeru Slope Classes			
No.	Slope Class (%)	Area (ha)	Area (%)
1	>2	13	3%
2	2 to 5	41	8%
3	5 to 8	39	7%
4	8 to 15	64	12%
5	15 to 30	161	30%
6	30 to 60	151	29%
7	<60	60	11%
	Total Area	530	100%

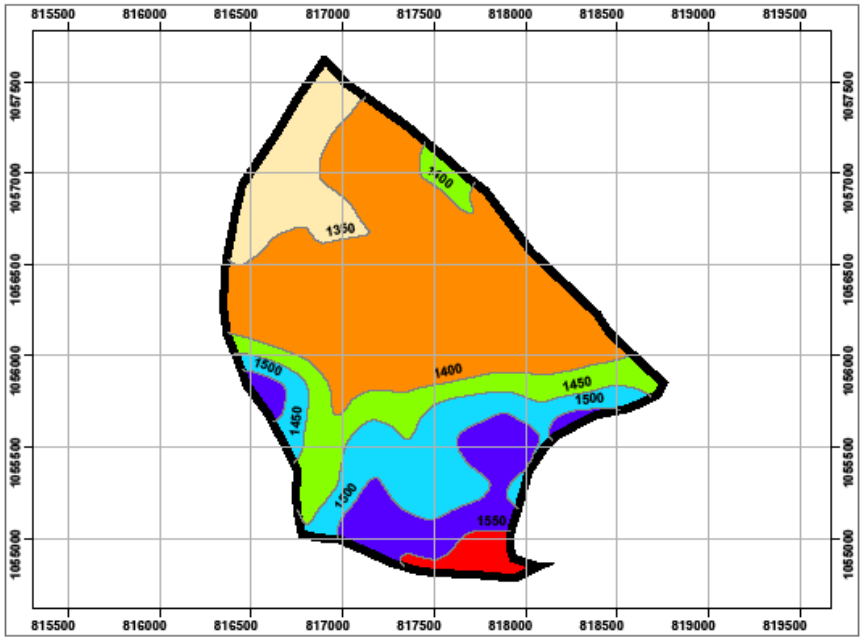


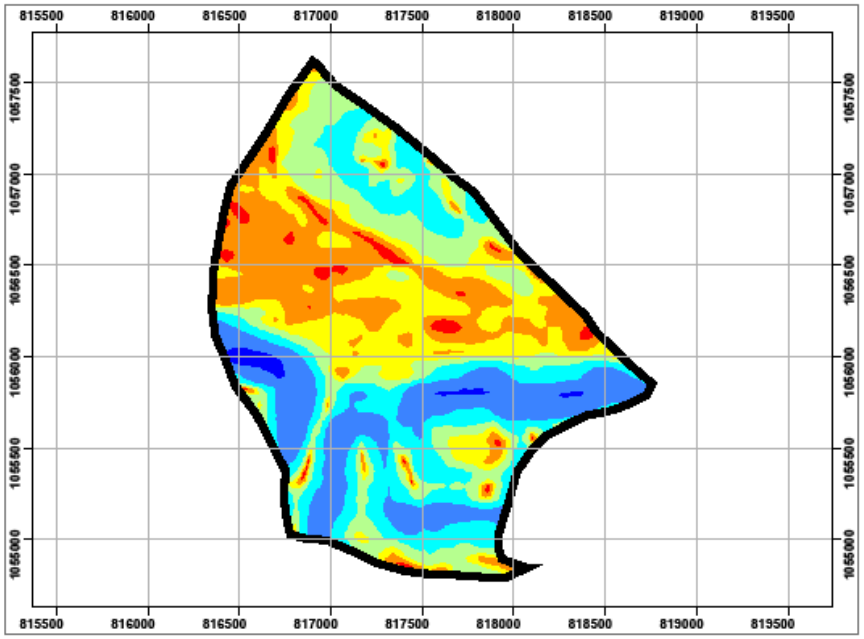
Ejeru Soil Types and Area

	Soil Type	Area (km2)	Area (ha)	Area (%)
1	Dystric Nitisols	1.57	157	30%
2	Gypsic Yermosols	0.72	72	14%
3	Leptosols	2.77	277	52%
4	Orthic Solonchaks	0.25	25	5%
	Total Area	5.30	530	100%

Ejeru Landuse/Landcover & Area

	Major Classes	Area (km2)	Area (ha)	Area (%)
1	Bare land	0.38	38	7.2%
2	Cultivated land	4.78	478	90.2%
3	Physiognomic vegetation	0.14	14	2.6%
	Total Area	5.30	530	100.0%





LEGEND

- Contour 50m Interval
- Catchment Boundary

Altitude (m)

- 1,300 - 1,350
- 1,350 - 1,400
- 1,400 - 1,450
- 1,450 - 1,500
- 1,500 - 1,550
- 1,550 - 1,579

Altitude Table

	Altitude (m)	Area (km^2)	Area (ha)	Area (%)
1	<1350	0.40	40	10.5%
2	1350 - 1400	1.83	183	47.7%
3	1400 - 1450	0.49	49	12.8%
4	1450 - 1500	0.59	59	15.4%
5	1500 - 1550	0.42	42	10.9%
6	>1550	0.10	10	2.7%
	Total Area	3.84	384	100.0%

LEGEND

- Catchment Boundary

Slope (%)

- < 2
- 2 - 5
- 5 - 8
- 8 - 15
- 15 - 30
- 30 - 60
- > 60

Slope Table

	Slopes Classes (%)	Area (km2)	Area (ha)	Area (%)
1	< 2	0.07	7	1.9%
2	2 to 5	0.77	77	20.0%
3	5 to 8	0.76	76	19.7%
4	8 to 15	0.76	76	19.9%
5	15 to 30	0.80	80	20.9%
6	30 to 60	0.64	64	16.6%
7	> 60	0.04	4	1.0%
	Total Area	3.84	384	100.00%

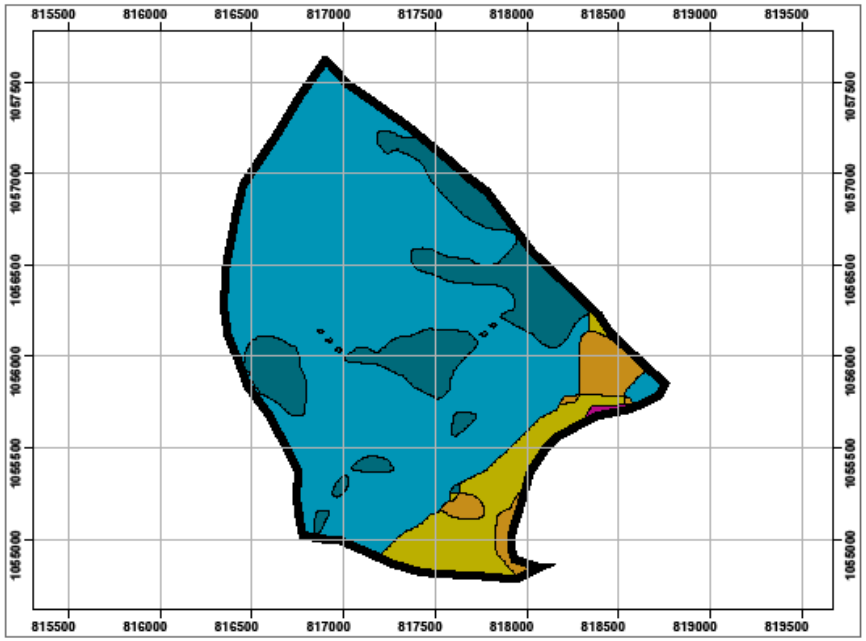
®

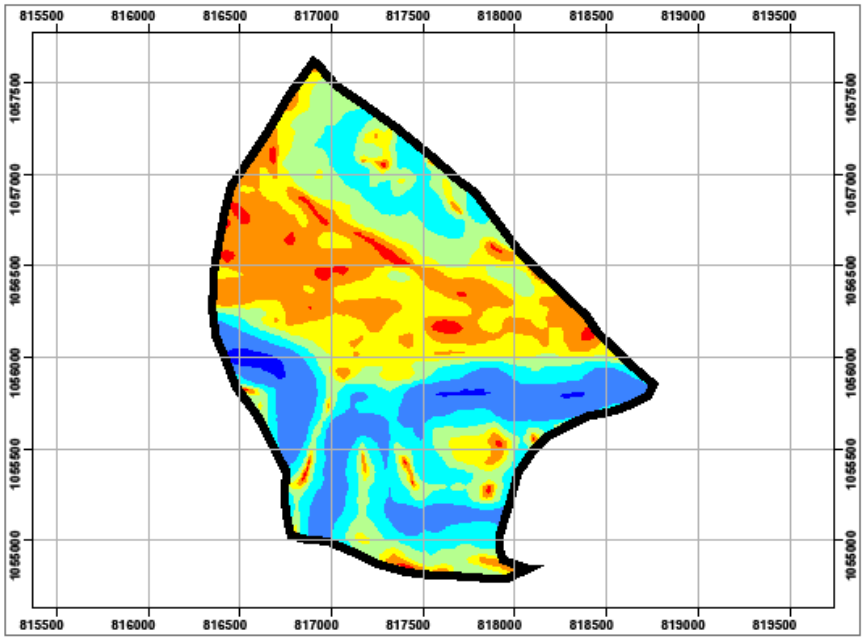
0 0.2 0.4 0.8 1.2 1.6 km

1:25,000

DIRE DAWA FLOOD MITIGATION PROJECT
IJA ANENI ALTITUDE AND SLOPES MAPS

DATE	06/09/07	FILE/DWG NUMBER	DDF\TD\032





LEGEND

Catchment Boundary

Soil Types

- Calcaric Fluvisols
- Chromic Vertisols
- Eutric Cambisols
- Haplic Phaeozems
- Lithosols

Soil Table

Soil Type	Area (km2)	Area (ha)	Area (%)
Calcaric Fluvisols	0.62	62	16.04%
Chromic Vertisols	0.01	1	0.29%
Eutric Cambisols	0.16	16	4.23%
Haplic Phaeozems	0.34	34	8.83%
Lithosols	2.71	271	70.61%
Total Area	3.84	384	100.00%

LEGEND

Catchment Boundary

Slope (%)

- < 2
- 2 - 5
- 5 - 8
- 8 - 15
- 15 - 30
- 30 - 60
- > 60

Slope Table

	Slopes Classes (%)	Area (km2)	Area (ha)	Area (%)
1	< 2	0.07	7	1.9%
2	2 to 5	0.77	77	20.0%
3	5 to 8	0.76	76	19.7%
4	8 to 15	0.76	76	19.9%
5	15 to 30	0.80	80	20.9%
6	30 to 60	0.64	64	16.6%
7	> 60	0.04	4	1.0%
	Total Area	3.84	384	100.00%

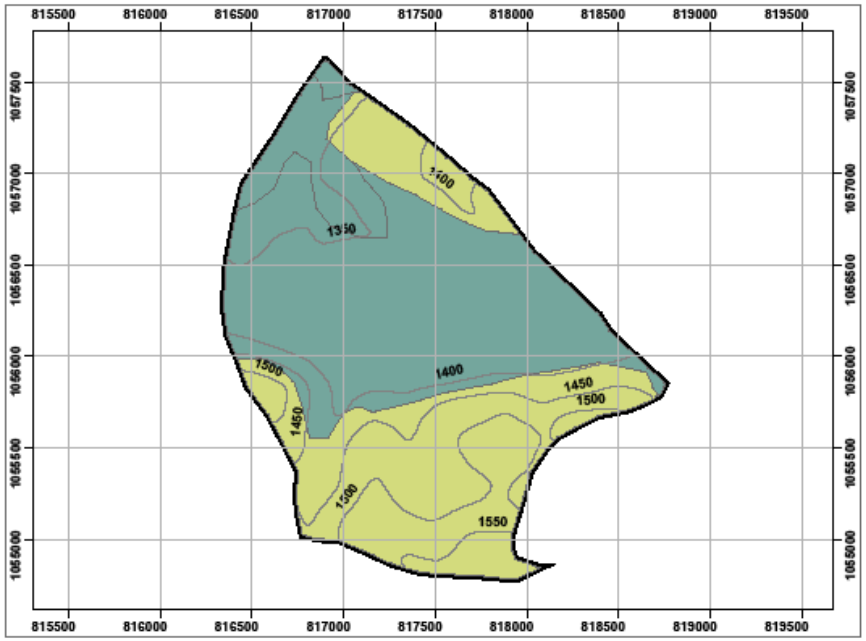
®

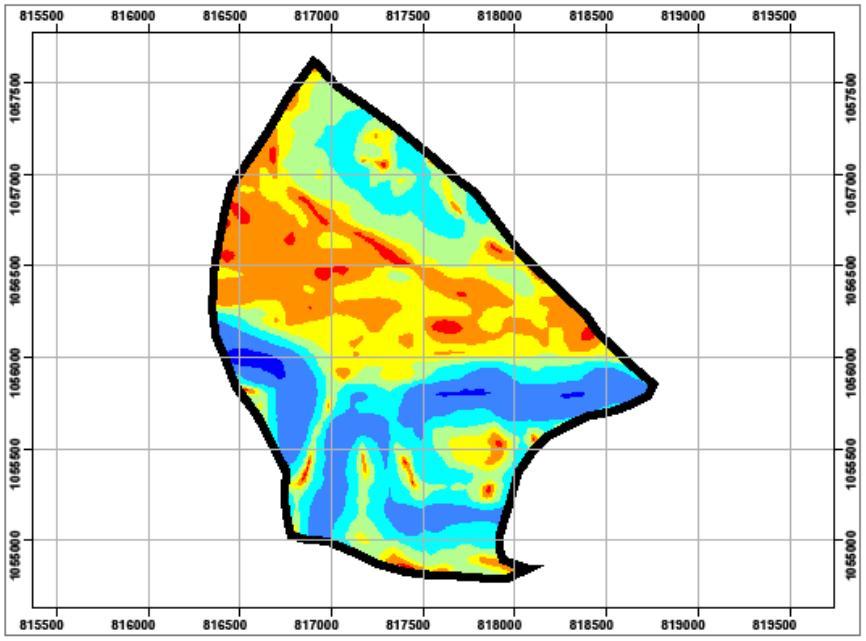
0 0.2 0.4 0.8 1.2 1.6 km

1:25,000

DIRE DAWA FLOOD MITIGATION PROJECT
IJA ANENI SOILS AND SLOPES MAPS

DATE	05/09/07	FILE/DWG NUMBER	DDF\TD\034





LEGEND

- Contour 50m Interval
- Catchment Boundary

Major Classes

- Bare Land
- Cultivated Land

	Major Classes	Area (km2)	Area (ha)	Area (%)
1	Bare land	1.66	166	43.3%
2	Cultivated land	2.18	218	56.7%
	Total Area	**3.84**	**384**	**100.0%**

LEGEND

- Catchment Boundary

Slope (%)

- < 2
- 2 - 5
- 5 - 8
- 8 - 15
- 15 - 30
- 30 - 60
- > 60

Slope Table

	Slopes Classes (%)	Area (km2)	Area (ha)	Area (%)
1	< 2	0.07	7	1.9%
2	2 to 5	0.77	77	20.0%
3	5 to 8	0.76	76	19.7%
4	8 to 15	0.76	76	19.9%
5	15 to 30	0.80	80	20.9%
6	30 to 60	0.64	64	16.6%
7	> 60	0.04	4	1.0%
	Total Area	**3.84**	**384**	**100.00%**

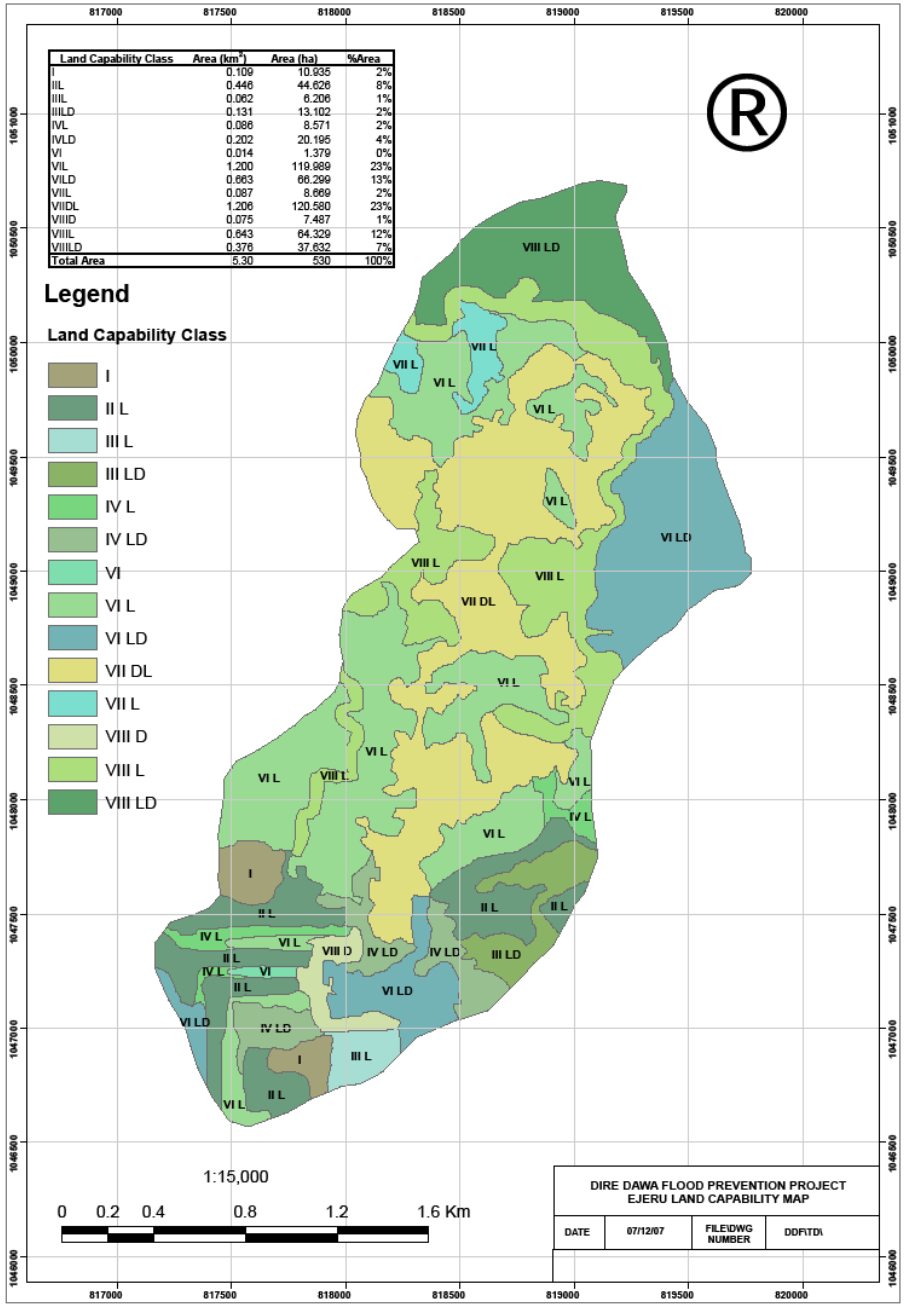
®

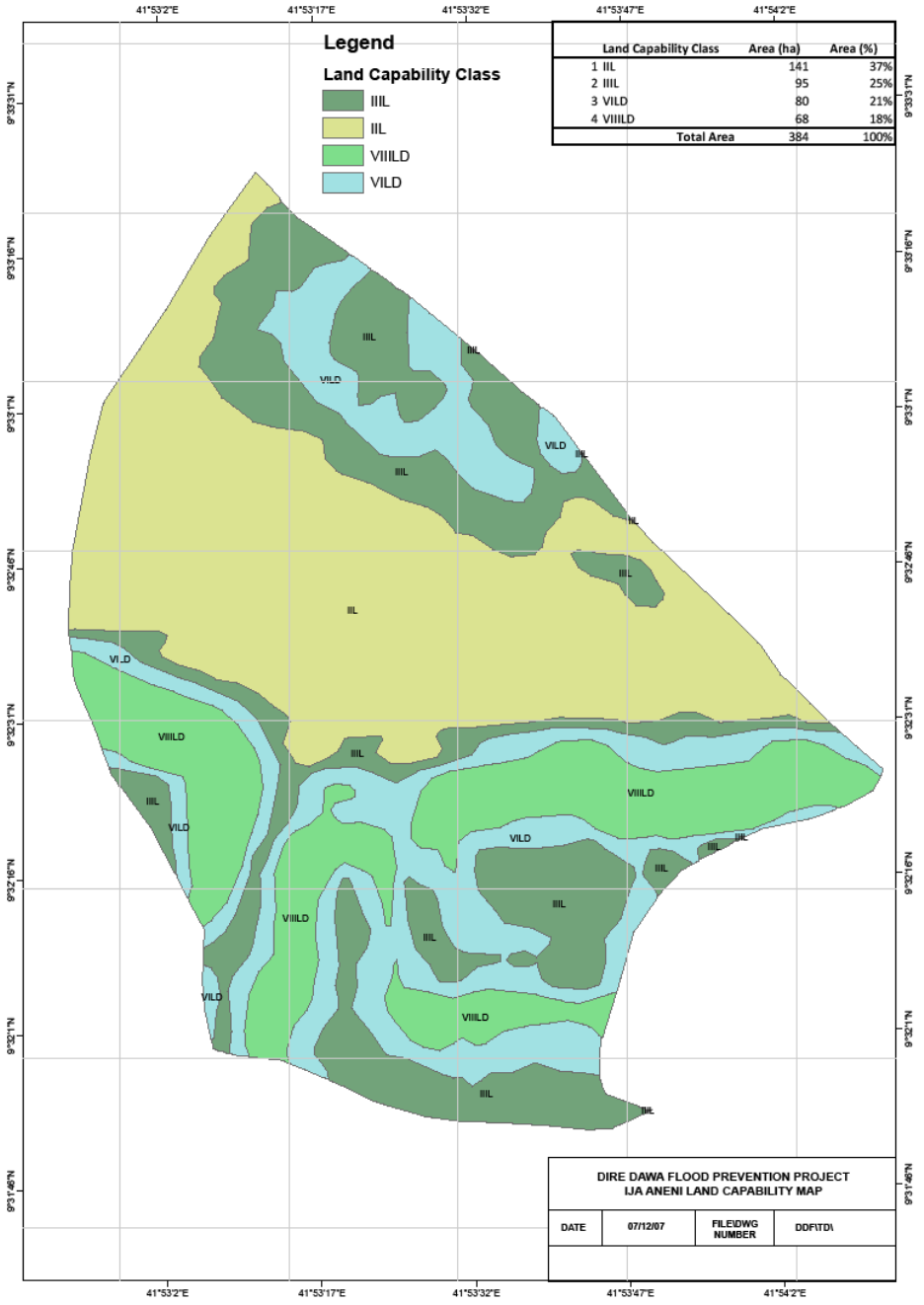
0 0.2 0.4 0.8 1.2 1.6 km

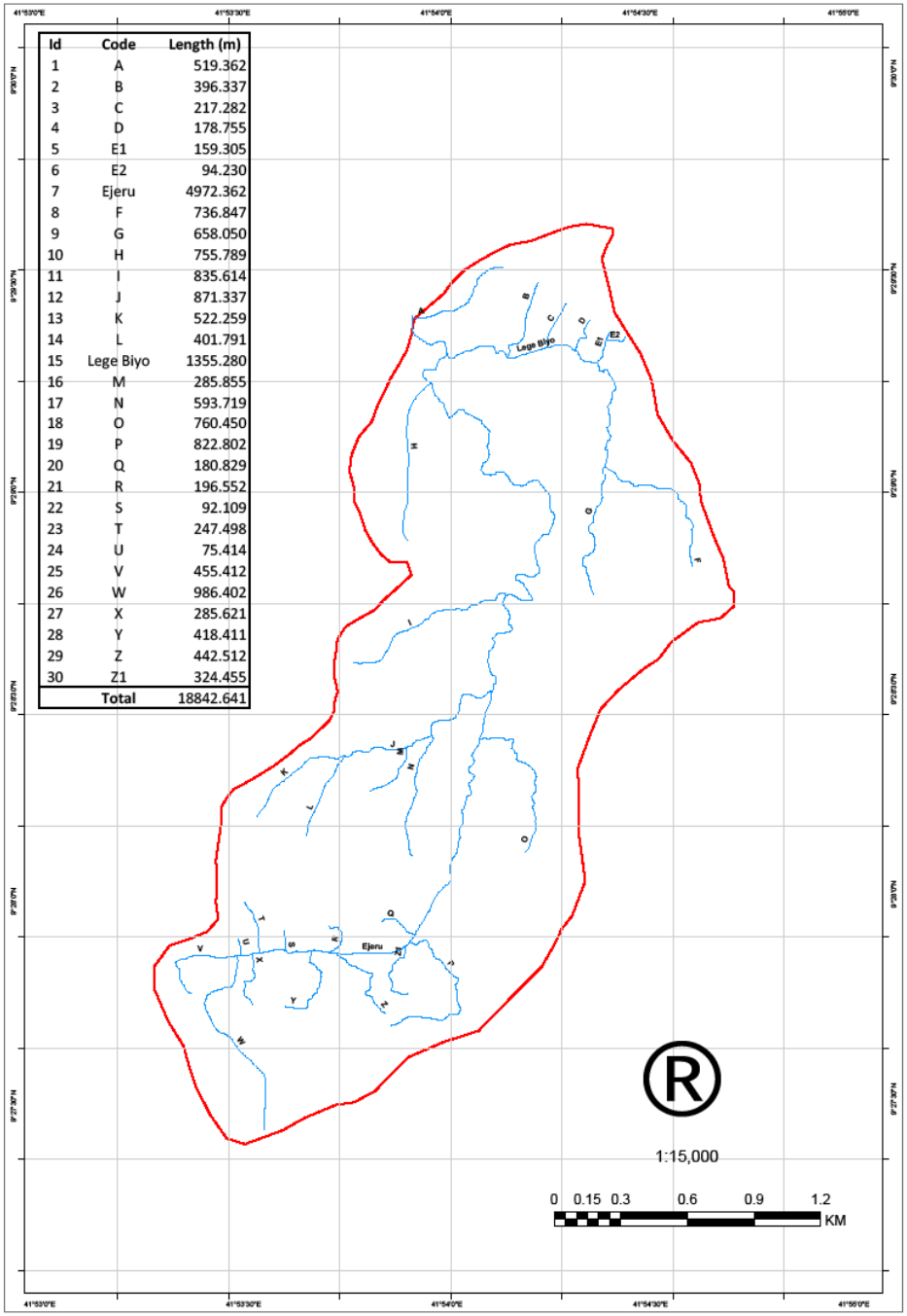
1:25,000

DIRE DAWA FLOOD MITIGATION PROJECT
IJA ANENI LANDUSE/LANDCOVER AND SLOPES MAPS

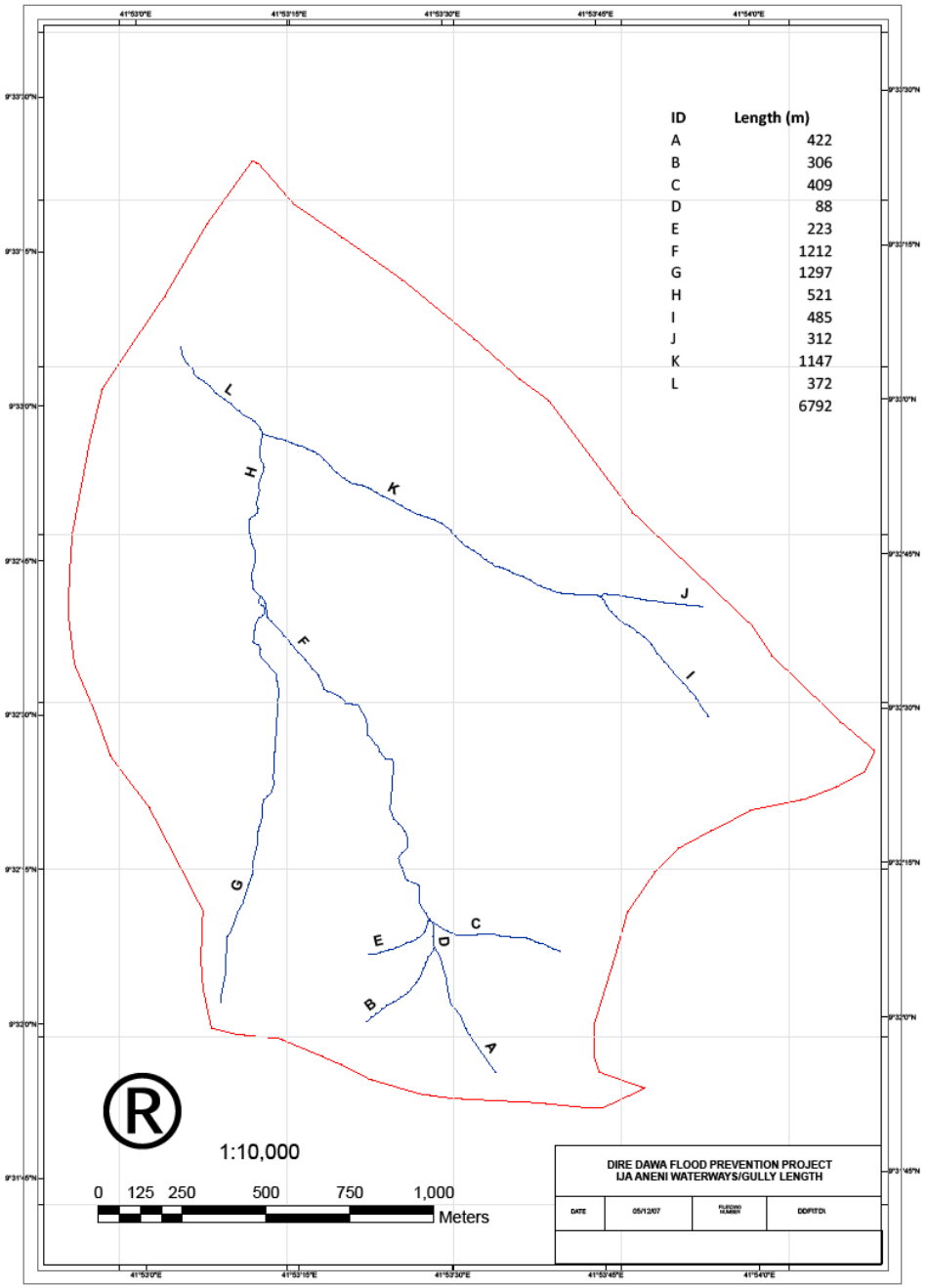
DATE	06/09/07	FILE/DWG NUMBER	DDF\TD\036


817000
817500
818000
818500
819000
819500
820000
1050000
1049500
1049000
1048500
1048000
1047500
1047000
1046500
1046000
Land Capability Class | Area (km²) | Area (ha) | %Area
I | 0.109 | 10.935 | 2%
IIL | 0.446 | 44.626 | 8%
IIIL | 0.062 | 6.206 | 1%
IIILD | 0.131 | 13.102 | 2%
IVL | 0.086 | 8.571 | 2%
IVLD | 0.202 | 20.195 | 4%
VI | 0.014 | 1.379 | 0%
VIL | 1.200 | 119.989 | 23%
VILD | 0.663 | 66.299 | 13%
VIIL | 0.087 | 8.669 | 2%
VIIDL | 1.206 | 120.580 | 23%
VIIID | 0.075 | 7.487 | 1%
VIIIL | 0.643 | 64.329 | 12%
VIIILD | 0.376 | 37.632 | 7%
Total Area | 5.30 | 530 | 100%
Legend
Land Capability Class
I
II L
III L
III LD
IV L
IV LD
VI
VI L
VI LD
VII DL
VII L
VIII D
VIII L
VIII LD
1:15,000
0 0.2 0.4 0.8 1.2 1.6 Km
DIRE DAWA FLOOD PREVENTION PROJECT
EJERU LAND CAPABILITY MAP
DATE
07/12/07
FILE\DWG NUMBER
DDF\TD\


41°53'2"E
41°53'17"E
41°53'32"E
41°53'47"E
41°54'2"E
9°33'31"N
9°33'16"N
9°33'1"N
9°32'46"N
9°32'31"N
9°32'16"N
9°32'1"N
9°31'46"N
Legend
Land Capability Class
IIIL
IIL
VIIILD
VILD
Land Capability Class | Area (ha) | Area (%)
1 IIL | 141 | 37%
2 IIIL | 95 | 25%
3 VILD | 80 | 21%
4 VIIILD | 68 | 18%
Total Area | 384 | 100%
DIRE DAWA FLOOD PREVENTION PROJECT
IJA ANENI LAND CAPABILITY MAP
DATE | 07/12/07 | FILE\DWG NUMBER | DDF\TD\



Id	Code	Length (m)
1	A	519.362
2	B	396.337
3	C	217.282
4	D	178.755
5	E1	159.305
6	E2	94.230
7	Ejeru	4972.362
8	F	736.847
9	G	658.050
10	H	755.789
11	I	835.614
12	J	871.337
13	K	522.259
14	L	401.791
15	Lege Biyo	1355.280
16	M	285.855
17	N	593.719
18	O	760.450
19	P	822.802
20	Q	180.829
21	R	196.552
22	S	92.109
23	T	247.498
24	U	75.414
25	V	455.412
26	W	986.402
27	X	285.621
28	Y	418.411
29	Z	442.512
30	Z1	324.455
	Total	18842.641

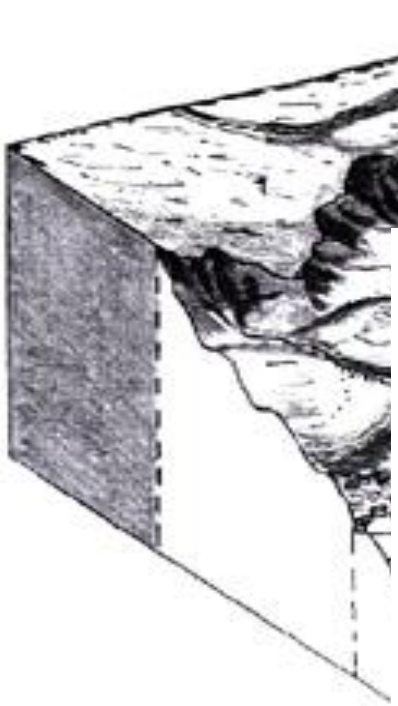

41°53'0"E
41°53'15"E
41°53'30"E
41°53'45"E
41°54'0"E
9°33'0"N
9°32'45"N
9°32'30"N
9°32'15"N
9°32'0"N
9°31'45"N
ID Length (m)
A 422
B 306
C 409
D 88
E 223
F 1212
G 1297
H 521
I 485
J 312
K 1147
L 372
6792
L
H
K
J
I
F
G
E
D
C
B
A
1:10,000
0 125 250 500 750 1,000
Meters
DIRE DAWA FLOOD PREVENTION PROJECT
IJA ANENI WATERWAYS/GULLY LENGTH
DATE
05/12/07
DDPIITDI

No	Section Code	Length in m	Treatment required
1	A	422	Gully treatment
2	B	306	Gully treatment
3	C	409	Gully treatment
4	D	88	Gully treatment
5	E	223	Gully treatment
6	F	1212	2 SS dam
7	G	1297	Gully treatment
8	H	521	1 SS dam
9	I	485	Gully treatment
10	J	312	Gully treatment
K	K	1147	2 SS dam
12	L	372	Gully treatment
Total		6794	Gully treatment

Summary of SWC Costs for Study Micro-Catchments

Item	Ejeru	Eje Aneni
Area (ha)	530	384
All LDUs Costs	946009	233654
LDU Costs	590960	565508
Total cost	1,536,969	799,162
Cost Birr/ha	2,900	2,081

PWD: RECOGNIZING PEOPLE'S AND WATERSHED POTENTIALS



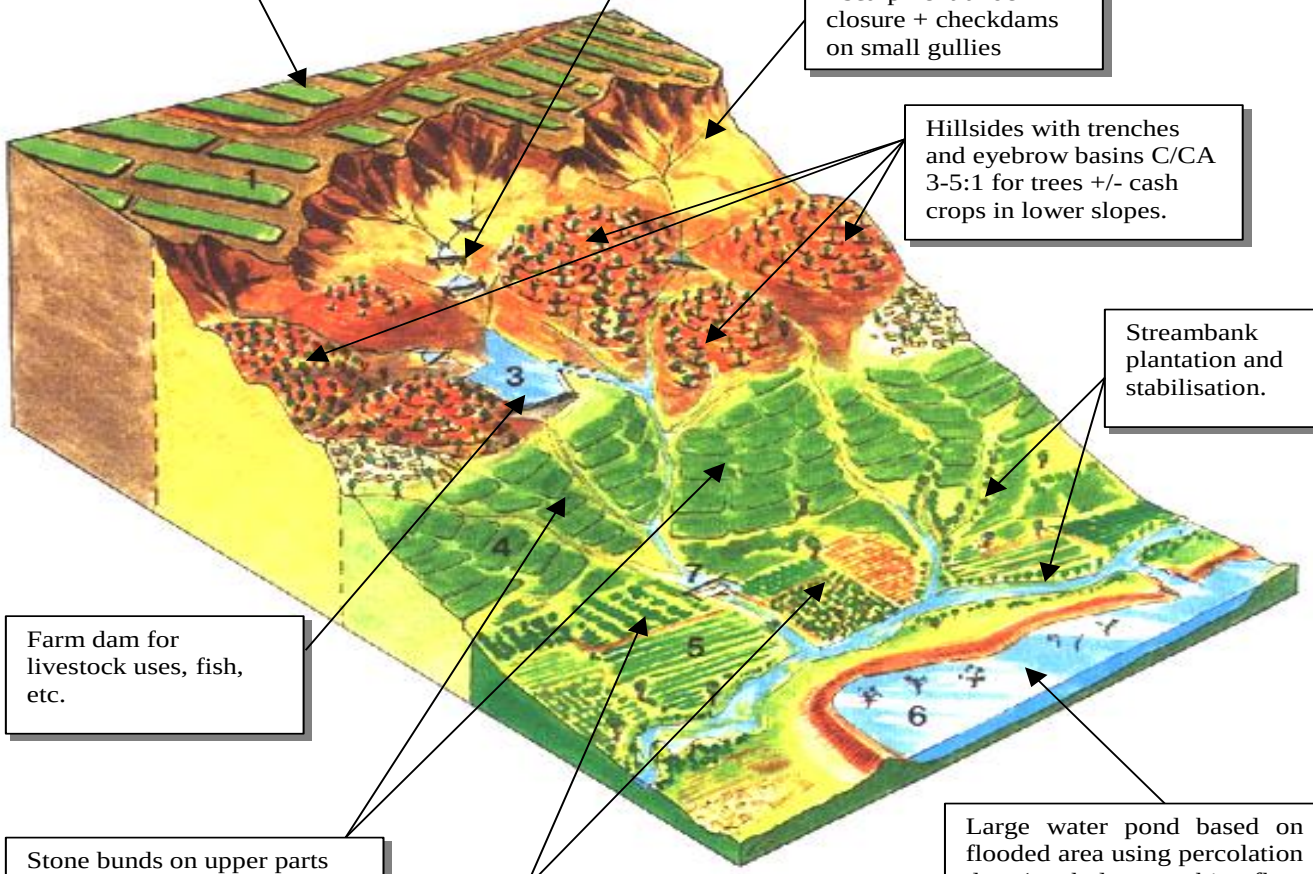
Plateau treated with stone faced bunds with runoff-runon system using C/CA 1:1 – tie ridging and stabilization along bunds with legume trees/shrubs + control grazing.

SS dams in series + closure of catchment area (plantation of crops on SS dam based upon sedimentation rate – start with ring cultivation).

Escarpment under closure + checkdams on small gullies

Hillsides with trenches and eyebrow basins C/CA 3-5:1 for trees +/- cash crops in lower slopes.

Streambank plantation and stabilisation.



Farm dam for livestock uses, fish, etc.

Stone bunds on upper parts and stone faced soil bunds on medium and lower slopes + lateral spillways and gully control. Bunds also stabilised with legume shrubs.

Irrigated perimeters using hand-dug wells (each for 0.1-0.25 ha plots) – horticulture. Microponds also possible, including in villages.

Large water pond based on flooded area using percolation dam (earth dam + gabion flow structure). Cultivation during the dry season on residual moisture.


Thank
you