Vegetation Ecology and Ethnobotanical Study of Hirmi Forest, North West Zone of Tigray Region, Ethiopia

By

Mehari Girmay

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Shire-Tigray-Ethiopia

Introduction

- **Diverse physiographic** and **climatic features** of the country;
  - **formation** of different **ecosystems**
    - variations in ***species diversity, soil types & vegetation***

- **Vegetation cover** of an area has;
  - **definite structure** and **composition**
    - developed as a result of long-term ***interaction of biotic and abiotic factors***

Cont…

- Those factors can be **natural or anthropogenic** such as
  - Growing human population
  - Habitat fragmentation/ degradation
  - overexploitation natural resources (Peters, 1996)
- MoA(2003) report reveals,

➢ Tigray is one of the most **environmentally degraded regions**

✓ left with few ***remnant natural vegetation, i.e.*** only 0.2 % of the total land mass of the region (H &N factors)

Cont…

- This **imposes** to get **insufficient service** from the ecosystem
- To get a **benefit** & **services** ***associated with ecosystem***,
  - **Vegetation** should be **conserved** and protected from such threats
- For the ***implement plant biodiversity conservation*** strategies,
  - **determinates affect** for the vegetation diversity, requires prioritization and investigation(FDRE, 2007)

1.2. Statement of the problem

Current global attention, conservation of dry land ecosystem (coverage, rich BD, socio-economic & cultural value) (CBD, 2006)

constitute about 65 % of the landmass Ethiopia (Demel Teketay, 2001).

Habitat degradation & deforestation

affect the capacity of forests to provide ecosystem services

Following the long history of land degradation, many land rehabilitation & conservation programs have been carried out in N. Ethiopia (EFAP, 1994)

lack of adequate understanding on biological resources & interaction with the environment ;

challenges implementing effective policies for the sustainable utilization and conservation of biodiversity

Statement of the problem (cont.……)

- In another aspect, study conducted by Ermias Lulekal *et al*. (2013) reveals that;
  - ✓ medicinal plants play a significant role in supporting primary healthcare in Ethiopia

- However, inadequate investigation has been done to
  - ➢ scientifically document
  - ➢ explore and promote;

    medicinal plants and associated knowledge dynamics in Ethiopia

- Ethnobotanical studies measure requires:
  - ✓ conserving and record to medicinal plants &
  - ✓ associated knowledge

  further for conservation scheme of the overall plants in the country

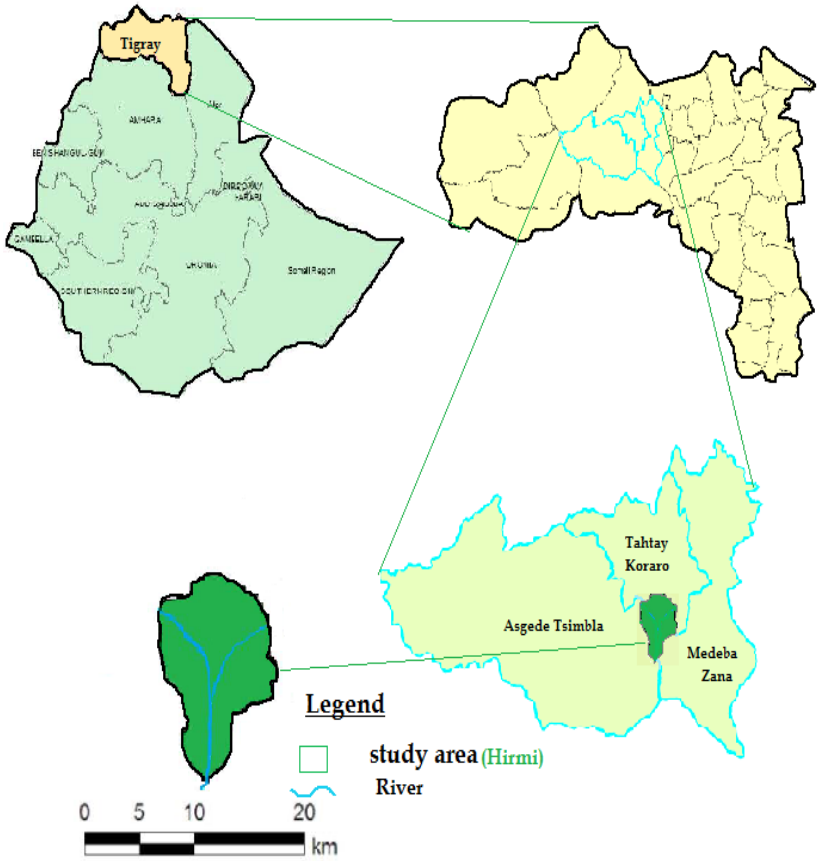
Objectives of this research are to:

1. To asses floristic composition and diversity of Hirmi forest.
2. To determine the major plant communities in the forest ecosystem
3. To see the distribution of plant community in relation to the environmental variables.
4. Correlating the soil parameters and characters in distribution of plant species.
5. To assess the major threats to forest
6. Assess the knowledge, utilization and management practices for medicinal plants of Hirmi forest by the surrounding community.

- Recommend appropriate methods of conservation and management approaches for sustainable utilization of the biodiversity in the study area.

Description of the study area

- Hirmi forest is found North West Zone-Tigray
- latitude of 13º49'– 14º04' N&longitude of 38º14' – 38º25'E
- The total forest area = 239.84 km^2 located in 12 kebeles of three woreda.
- **Vegetation**- *Acacia-Comiphora* woodland and *Combretum–Terminalia* woodland type



Ethnobotanical data- from 6 Kebele(small administrative villages)

370 HH was taken from the total of 4,868 population via $\mathbf{n} = \frac{\mathbf{N}}{\mathbf{1+N(e)^2}}$

- 88 species was recorded

- about 60% of the community is used herbal medicine to treat for both human and animal disease
- 99% species used to treat human are also used to treat animal disease.
- people in the community are who have good awareness on those herbal medicinal plants have good perception toward their conservation

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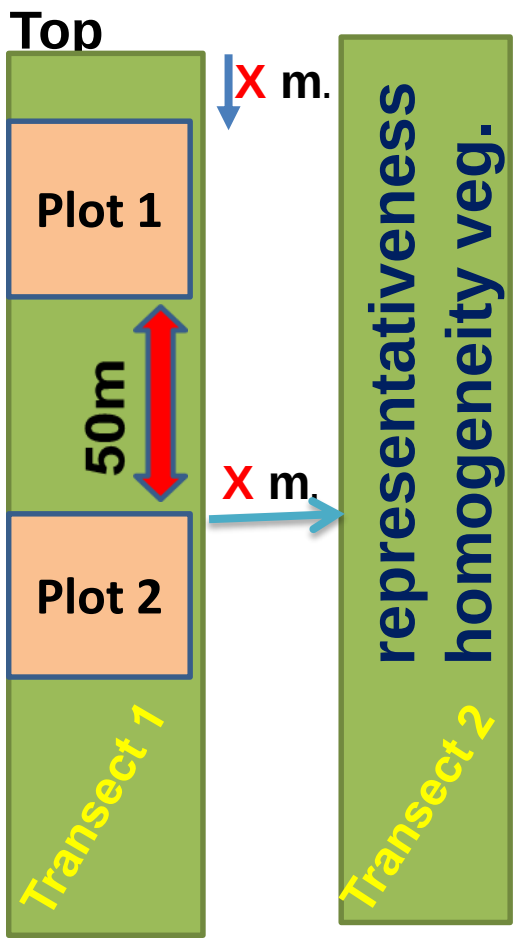
Top
X m.
Plot 1
50m
X m.
Plot 2
Transect 1
Transect 2
representativeness
homogeneity veg.

Down

DBH, species abundance, density and tertian variables affect the plans biodiversity was also measured

Measuring of DBH

Slope recording

- 10 transect was laid
  - 204 species in 94 plots was collected
- 90 amilies and 101 genera
- Poaceae(14.5%) Combretaceae(14%),
- Fabaceae(12%), Asteraceae(11%)
- Moraceae (8%), Lamiaceae(6.1%)
- Rubiaceae(5.5%) and Ebenaceae(4.1%).
- The rest 24.8 % plant families were belongs to other different families.

- About 75 soil samples from each vegetation quadrant were taken for various soil chemistry parameters laboratory analysis and correlate with vegetation distribution in Shire agricultural research center
- As result, a sandy loam type of soil is the major soil type.

As result, a sandy loam type of soil is the major soil type

The rest of parameters was associated with species distribution

A glimpse for some laboratory result of soil sample

CLIENT NAME: Mehari Girmay
ADDRESS: Addis Ababa

ATT:
TEL.:
INVOICE:
CLIENT REF:
NO. SAMPLES: 10
SAMPLE TYPE: Soil

LAB JOB NO. 1
SAMPLES RECEIVED: 02/19/2018
ANALYSIS INSTRUCTIONS RECEIVED:
DATE OF REPORT: 6/6/2018
STATUS OF REPORT:
ANALYSIS COMPLETE: 05/28-2018

Approved Signatories
Tsadik Tadele
Frezgi Mekonen

Parameters

S/No	C.Code	PH	EC(mmh	Av. P	% OC	% OM	%TN	CEC(meq/100)	%Sand	%Silt	%Clay	Tex. Class
11	P-11	5.370	0.140	18.474	1.112	1.918	0.096	20.20	72	18	10	Sandy Loam
12	P-12	5.300	0.186	6.827	1.854	3.196	0.160	49.40	76	10	14	Sandy Loam
13	P-13	5.550	0.298	11.888	1.884	3.248	0.162	14.40	74	14	12	Sandy Loam
14	P-14	5.570	0.184	14.779	2.123	3.660	0.183	18.60	76	8	16	Sandy Loam
15	P-15	6.200	0.399	26.104	3.410	5.878	0.294	24.00	72	14	14	Sandy Loam
16	P-16	5.850	0.120	6.667	0.551	0.950	0.048	6.80	80	10	10	Sandy Loam
17	P-17	6.100	0.349	10.522	2.830	4.879	0.244	20.20	72	16	12	Sandy Loam
18	P-18	5.980	0.287	10.281	2.109	3.636	0.182	15.00	74	14	12	Sandy Loam
19	P-19	5.570	8.600	2.651	0.500	0.863	0.043	18.40	78	12	10	Sandy Loam
20	P-20	5.300	0.140	3.936	0.397	0.685	0.034	14.20	74	10	16	Sandy Loam

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SAMPLE TYPE: Soil

LAB JOB 1
SAMPLES RECEIVED 2/19/2018
ANALYSIS INSTRUCTIONS RECEIVED:
DATE OF REPORT: 6/6/2018
STATUS OF REPORT:
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Parameters

S/No	C.Code	PH	EC(mmh)	Av. P(PPm)	% OC	% OM	%TN	CEC(meq/100)	%Sand	%Silt	%Clay	Tex. Class
1	P-1	6.120	0.526	16.466	2.466	4.251	0.213	12.40	74	16	10	Sandy Loam
2	P-2	5.800	0.251	9.799	1.301	2.242	0.112	9.20	70	16	14	Sandy Loam
3	P-3	5.240	9.005	3.293	0.541	0.933	0.047	17.00	74	14	12	Sandy Loam
4	P-4	5.060	0.188	6.506	1.216	2.096	0.105	8.00	64	26	10	Sandy Loam
5	P-5	5.500	0.409	9.960	0.936	1.614	0.081	28.00	60	26	14	Sandy Loam
6	P-6	5.550	0.385	10.281	0.849	1.463	0.073	13.80	70	14	16	Sandy Loam
7	P-7	5.220	0.158	6.506	0.889	1.533	0.077	5.40	74	16	10	Sandy Loam
8	P-8	5.180	0.262	13.414	0.772	1.331	0.067	18.40	76	10	14	Sandy Loam
9	P-9	5.700	0.487	21.365	2.741	4.726	0.236	20.60	72	12	16	Sandy Loam
10	P-10	5.800	0.429	16.466	2.871	4.949	0.247	22.40	62	26	12	Sandy Loam

ADDRESS: Addis Ababa

ATT:
TEL.:
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CLIENT REF:
NO. SAMPLES: 12
SAMPLE TYPE: Soil

SAMPLES RECEIVED: 02/19/2018
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Parameters

S/No	C.Code	PH	EC(mmh)	Av. P(PPm)	% OC	% OM	%TN	CEC(meq/100)	%Sand	%Silt	%Clay	Tex. Class
21	P-21	5.900	0.340	8.916	1.947	3.357	0.168	30.00	54	28	18	Sandy Loam
22	P-22	6.270	0.346	7.871	1.700	2.930	0.147	20.20	48	38	14	Loam
23	P-23	6.110	0.168	2.811	1.353	2.333	0.117	37.20	54	32	14	Sandy Loam
24	P-24	6.550	0.199	8.675	0.812	1.401	0.070	21.60	64	24	12	Sandy Loam
25	P-25	5.540	0.239	3.534	1.128	1.945	0.097	14.40	66	22	12	Sandy Loam
26	P-26	5.520	0.208	4.096	1.167	2.012	0.101	25.20	62	28	10	Sandy Loam
27	P-27	5.430	0.141	2.651	0.758	1.306	0.065	23.00	58	32	10	Sandy Loam
28	P-28	5.250	0.219	4.096	1.580	2.724	0.136	21.60	52	36	12	Sandy Loam
29	P-29	5.600	1.300	52.851	2.407	4.149	0.207	49.20	54	32	14	Sandy Loam
30	P-30	5.210	0.202	5.301	2.630	4.534	0.227	26.60	58	32	10	Sandy Loam
31	P-31	5.520	0.279	3.373	2.486	4.286	0.214	23.40	52	32	16	Sandy Loam
32	P-32	5.800	0.577	6.586	2.044	3.524	0.176	30.00	40	34	26	Loam

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Conserving of nature at local level

brings global changes