FARM Africa

Natural Resource Management Programme

Chilimo Forest change analysis

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1 Introduction

Chilimo forest is located in west showa zone in Dendi woreda; about 70km away from Addis Ababa in the Northwest direction. Chilimo forest is important to the local people for grazing their animals. It is also source of construction materials. But it has been threatened by unnecessary exploitation and conversion to other land uses. Responding to this problem FARM Africa and SOS Sahel Ethiopia has implemented Participatory Forest Management (PFM) in chilimo since 1996. Now it is about 16 years since implantation has been started. This piece of work is aimed to see the impact of PFM on chilimo forest using time series satellite images.

2 Objectives

1. To analyze area coverage change of Chilimo Forest using four period satellite images.
2. To see the impact of PFM in Ethiopia on forest coverage
3. To use free satellite image for Forest monitoring

3   Method and materials used

3.1   Location of Chilimo Forest

Chilimo forest is located in the west showa zone; about 70km away from Addis Ababa in the Northwest direction. It is one of Government's Forest priority area surrounded by 7 kebeles engaged in traditional agricultural activities such as animal raising and crop cultivation.

Fig1: Location of Chilimo Forest

2
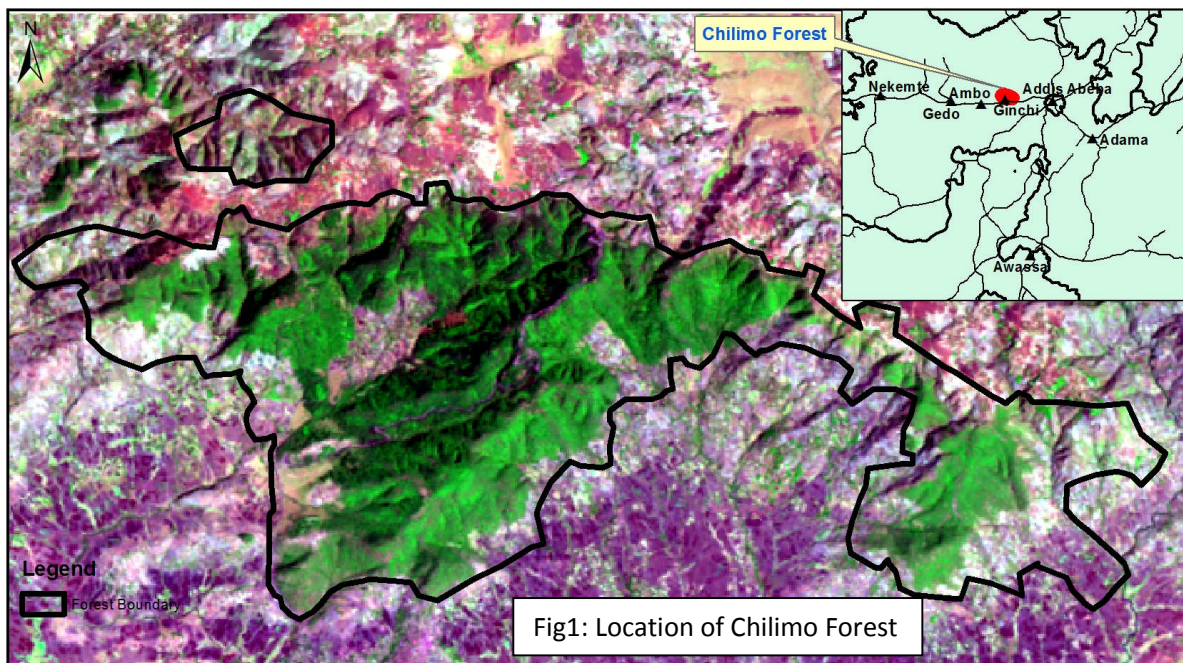
3.2 Materials

A. Satellite images: Free Landsat Satellite images (summarized in Table 1) were downloaded from United States Geological Survey (USGS) website (http://www.usgs.gov) and used in this analysis. All the images were Georefranced and radiometricaly corrected by USGS. All images are taken during dry season and cloud free.

Table1; Descriptions of satellite image

Satellite	Sensor	Pixel size	Date of acquisition
Land sat 5	TM	30m by30m	January 31,1987
Land sat 5	TM	30m by30m	January 24,1995
Land sat 7	ETM+	30m by30m	February 4,2003
Land sat 7	ETM+	30m by30m	Feburary13,2012

B. Other materials

- Softwares used are Arc GIS 10,and NVI 4.7

3.3 Methods

All images used in this analysis are cloud free and have been radiometrically and geographically corrected by USGS. ENVI 4.7 software was used to classify the images into Forest and non forest through supervised classification using maximum likelihood algorithm. Then the classified images were compared to see changes.

4 Result and discussion

Area coverage of Chillimo forest is presented in Table 2.The same result is shown in fig 2, 3, 4 and 5. Forest area of chillimo has been decreased by 18% between 1987 and 1995 but increased by 9% between 1995 and 2003.The 9% gain in forest cover is after the implantation of PFM. Between 2003 and 2012 the change is constant but negative magnitude is indicated.

Table2: Area coverage of Chilimo Forest by year (1987-2012)

	Area in 1987(ha)	Area in 1995(ha)	Area in 2003(ha)	Area in 2012(ha)	Change(%) from		
					1987 to 1995	1995 to 2003	2003 to 2012
Forest	3965.04	3231.54	3231.54	3470.49	-18.49918286	+9.290926308	-0.000173539
Non Forest	1662.66	2396.16	2396.16	2157.21	+44.116055	-12.53004808	+0.000292425
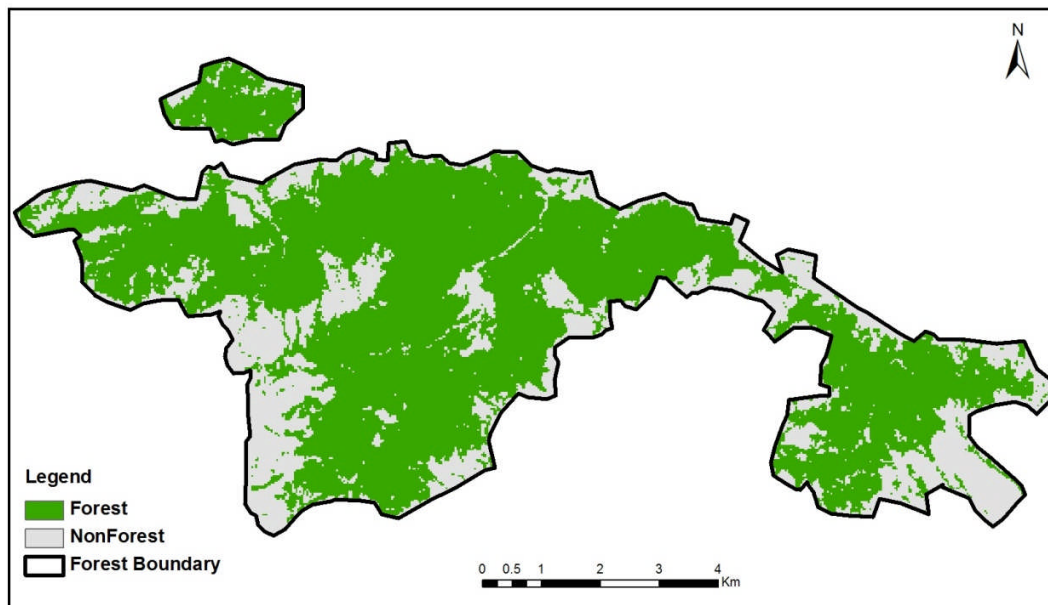
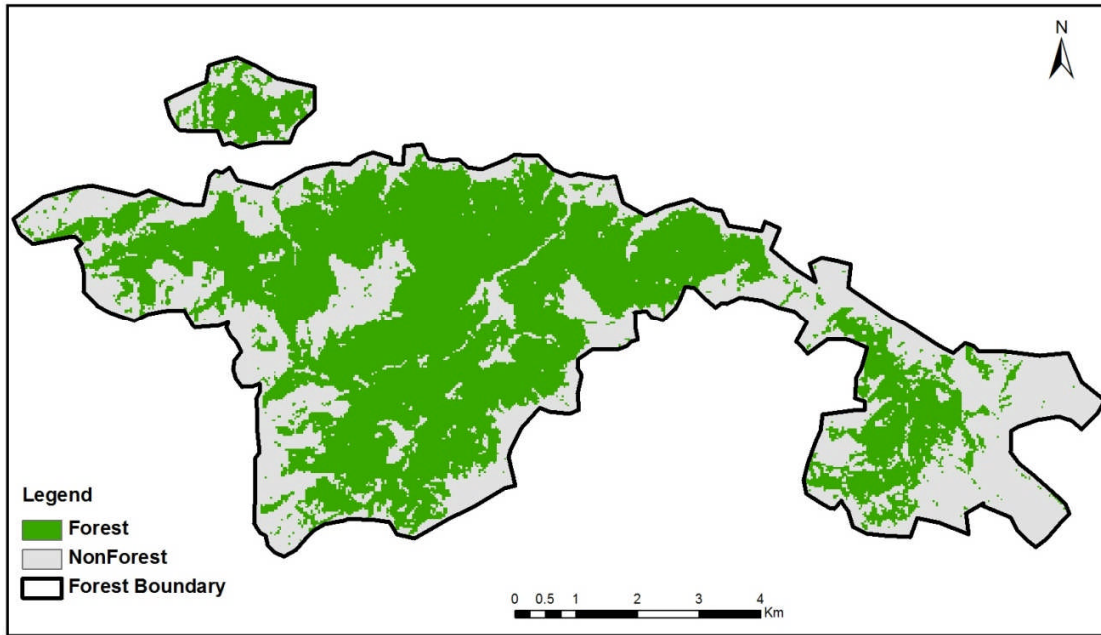Fig2: Chilimo Forest map of year, 1987
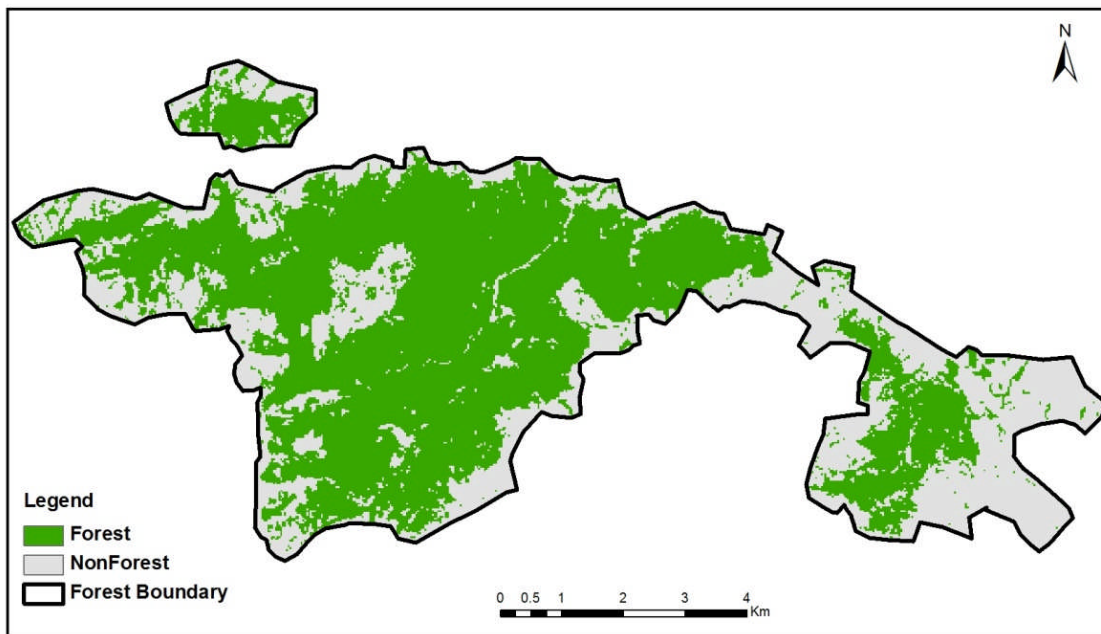
Fig3: Chilimo Forest map of year, 1995

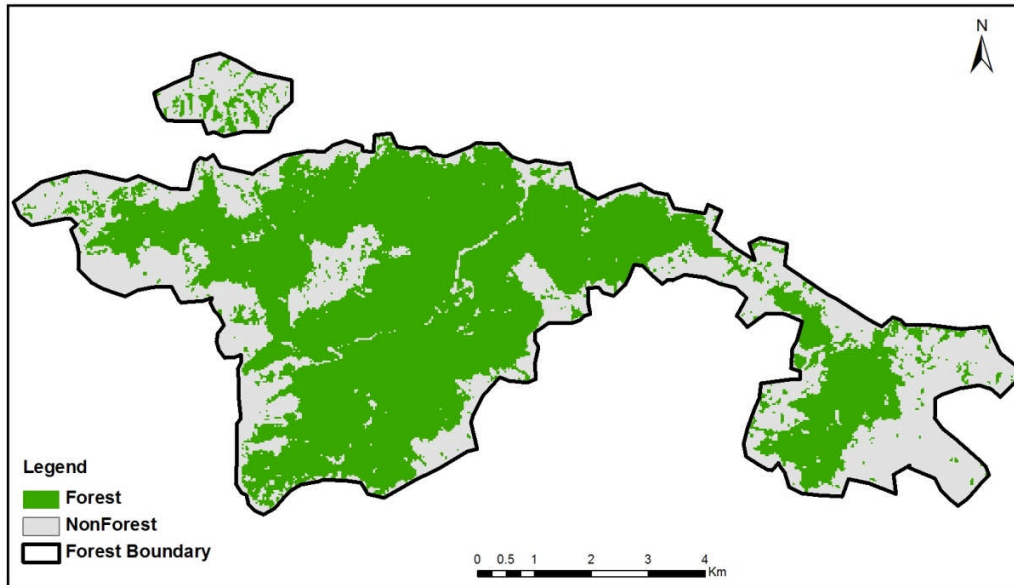Fig4: Chilimo Forest map of year, 2003

 Fig5: Chilimo Forest map of year, 2012

5   Conclusions and Suggestions

Chilimo Forest has been decreased until 1996 but after 1996 with start of Participatory Forest Management Program by FARM Africa and SOS Sahel Ethiopia in collaboration with the local Community forest size is increasing. Even though there are improvements in forest size but still special attention should be given to A, B and C directions as shown on Fig6 since most of the changes have been occurred in these directions.
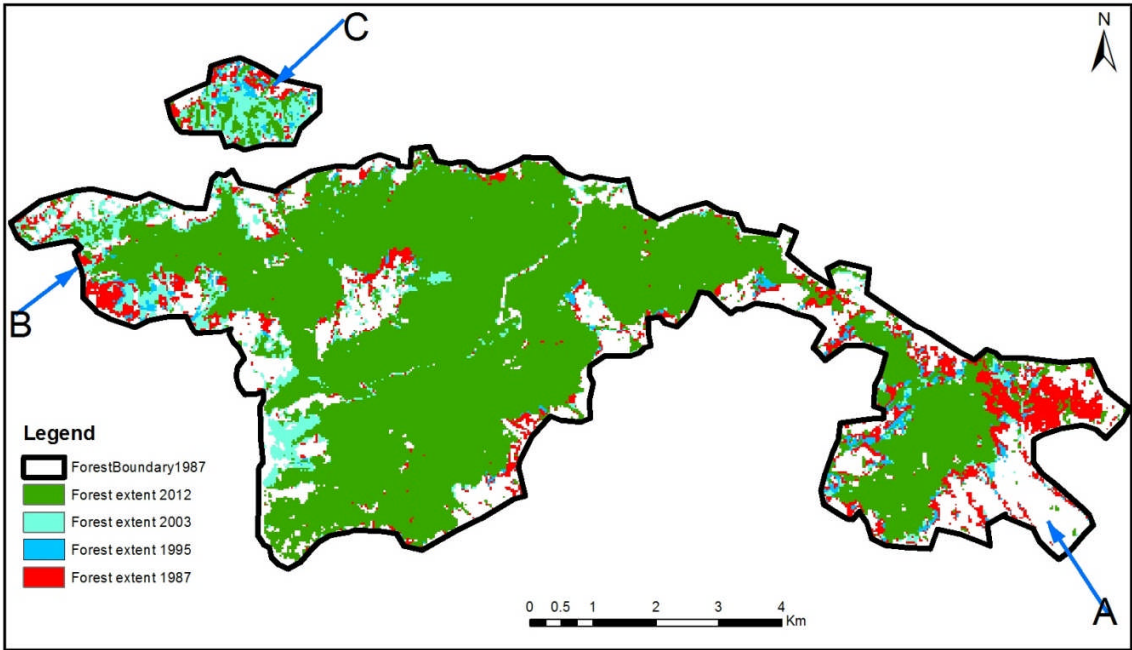
Fig 6 Change map of Chilimo Forest