

Cutting Trees to Harvest Votes: Micro evidence from Kenya

Ameet Morjaria

Harvard Kennedy School

Sustainable Science Program

ameet_morjaria@hks.harvard.edu

17th November 2010

This work was supported by the Economic and Social Research Council [RES-167-25-0214]

Our greatest asset in Kenya is our land. This is the heritage we received from our forefathers. In land lies our salvation and survival.

– Jomo Kenyatta (1968)

If the Attorney General cannot prosecute known land-grabbers and the ordinary citizen lacks the locus standi to take such cases to court, who will save Kenya?

– Wangari Maathai (1997)

Recent forest loss has resulted from government approved, politically motivated, and dubiously legal excisions of forest land from protected areas, reserves and plantations

– World Resource Institute (2000)

Question

- **FACT:**

- Between 1990 and 2000, Kenya lost 22% of its forest cover. Previously the loss in forest cover stood at 11% between 1973-1990. [UNEP (2001), FAO (2002), KFWG (various)]
- In 1995, 2.1% of Kenya's land was covered by closed forest – by 2003 this has reduced to 1.7%. [Wass (1995), UNEP (2006)]
- During the same period there was an increase in demand for democracy.

- **QUESTION:**

- Did the introduction of multi-party democracy lead to an accelerated loss in forest cover ?
- If so, what was the purpose?

Why the issue?

- **General:**
 - understanding factors of deforestation would aid to mitigate effects of drought, flooding and global warming.
 - impact of climate change on Africa is likely to be severe. Mainly due to high agricultural dependence and limited capacity [Collier, Conway and Venables 2008].
 - Core environmental agenda - forests lies at the intersection of water resource degradation, climate change and deforestation.

- **Specific → salient issue in Kenya:**

Why the issue?

- Weak political institutions can lead to pathologies in resource allocation:
 - There are various manifestations of weak institutions – country specific and need to be studied case-by case ...
 - One aspect of the weak institutions is the single-party state.
 - Besley and Kudamatsu (2007) – show some autocracies producing good outcomes. In Africa it has been dysfunctional.
 - In the early 1990's large demand for political liberalization in Africa but little is known on how regimes continued to survive and consolidate power.

Why Kenya?

- Aside access to data satellite imagery + excision data, Kenya provides a good laboratory to investigate political motives in forest land allocation:
 - Introduction of multi-party politics in 1992 was sudden and forced by Paris Club of donors.
 - Nature of administrative geography, ethnicity and politics in Kenya. District admin boundaries determine ethnicity and ethnicity is salient when it comes to politics. Voting in Kenya is primarily along ethnic lines and party labels serve to indicate ethnic groups.

Newspaper snippets

- *“Death knell sounds for forests”* – Nation (1998)
- *“Kenya’s rulers clear way for drought and disaster by felling forest for votes”* – The Independent – UK (2002)
- *“The NARC government should go for President Moi and Commissioners of Land who were involved. The former President and Commissioners of Land were legally empowered to give out land “and they are the ones who should be followed and not the vendors”* – Joseph Kamotho (former Education Minister under Moi) *“Ask Moi, Not Me, About Forest Plots”* – Nation (2004)
- *“Former President Moi and two MPs accused of land grabbing in Mau Forest Complex”* – African Press (2008)
- *Kenyan Premier Threatens to Name “Powerful” Beneficiaries of Disputed Forest* – KTN (private TV station, 2008)

Related Literature

- Distributive Politics

- two basic and opposed models of political resource allocation in presence of electoral competition:

- [1.] “Core supporter” models - Cox and McCubbins (1986): core voters most responsive because parties know their preferences and desires well.

- [2.] “Swing Voters” models – Lindbeck and Weibull (1987), Dixit and Londregan (1996)...

Both models widely tested in the US – on government spending and evidence is mixed (Larcinese, Snyder and Testa, 2006).

Related Literature (continued)

- Ethnic Favouritism
 - Ethnic diversity is empirically associated with low economic growth (Easterly and Levine, 1997)
 - Large anecdotal evidence (Bates, 1983)
 - Very few systematic studies...

- Ethnic Diversity & Public Policies
 - Solid link established between the level of ethnic diversity, public finance and the management of common property resources (Alesina and La Ferrara, 2005; Easterly and Levine, 1997)

Methodology

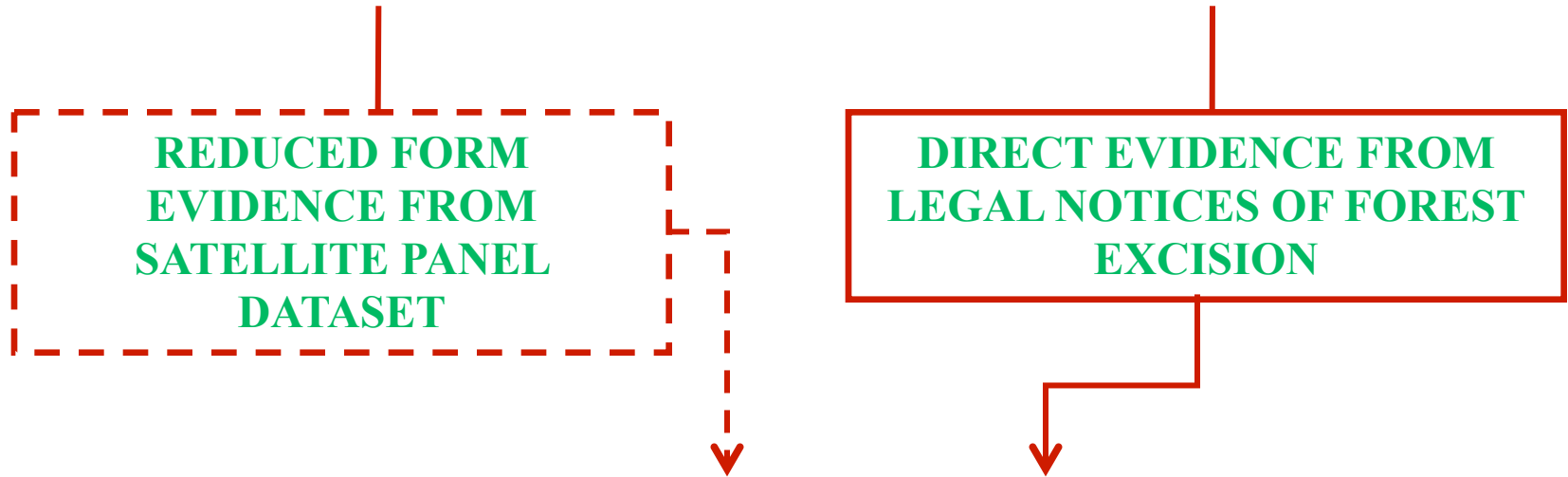
- I assume the introduction of multi-party democracy in 1992 as being orthogonal to the pre-existing trend in the destruction of the forests.
- Use unique feature of administrative geography, ethnicity and politics in Kenya. Use ethnic demography to classify Kenya districts into their political alliance towards ruling party. Cross sectional variation explored. Analysis then to follow and compare the trajectory of these different types of districts before and after introduction of democracy.
- I answer the question by:
 - Construct a unique satellite (unbalanced) panel dataset 1972-2002 at the constituency level to obtain reduced form evidence.
 - Collect a dataset of all legal notices of forest excisions (1963-2002) conducted by the government and “illegal” entry into forest land to uncover possible mechanisms.

The story...

introduction of multi-party political competition in 1992



demand for transfers increases, with limited traditional patronage (lower aid flows, civil service reorganisation) risk of losing power increases



forest allowed to be settled into/ “dished out” for political favours as forests are under ownership of the central government

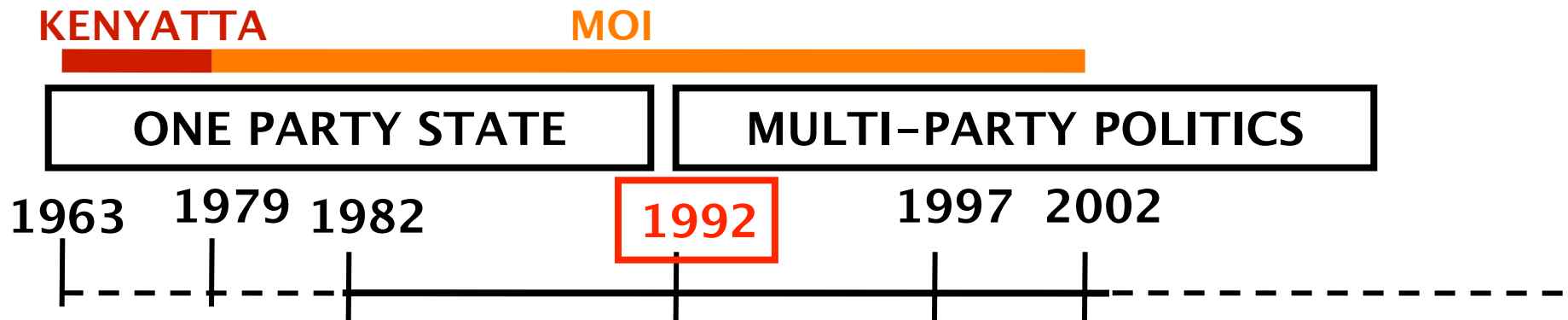
Limitations

1. Reduced form evidence + some understanding of mechanism.
2. Unbalanced panel nature of data set – cannot test particular hypothesis (e.g. election cycle)
3. Case Study
4. Contamination of effect by any variable that varies with type of district and changes before and after democracy.
5. ...

Plan of Talk

1. Context: Political Space and Forest Acts
2. Data: extracting forest cover from satellite pictures
3. Concluding Remarks

Context: Political Background I



1982: Amendment of Act Number 27 of 1982 – KANU sole legal party

Dec 1991: Constitution Amendment Act No. 12 – restore right to form alternative political parties

POWERFUL OFFICE OF THE PRESIDENT + LIMITED ROLE OF PARLIAMENT

(1) the *same* leader in power pre + post 1992.

Context: Political Background II

- Why was multi-party elections introduced in 1992?
 - Critical event shaped the introduction of multi-party elections:
WITHHOLDING OF FOREIGN AID IN NOV 1991 BY THE PARIS GROUP OF BILATERAL DONORS driven by –
 - Fall of Communism in Eastern Europe + end of Cold War.
 - Regime's blatant manipulation of the 1988 elections.
 - Murder of Foreign Minister Dr Ouko in Feb 1990 [strong Luo technocrat close to Moi but also a possible contender].

Context: Forest Acts I

- **Forest Reserves (FR's):** land area that has been surveyed, demarcated and gazetted either from *Trust Land* or un-alienated *Government Land*.

Management of Natural Forests + the Forest Resource in under the Forest Department of the Government of Kenya.

- **FR's on Government land (1,359,254 ha) are under Forestry Act (cap 385, 1962) and managed by the FD in the Ministry of Environment.**
- **Government Lands Act, Cap. 280 (revised 1984)**
 - In this Act, Section 3 gives the President power to “make grants or dispositions of any estates, interests in or over alienated Government land.
- **Forest Act, Cap 385 of 1962 (revised 1982)**
 - “forest area means an area of land declared under the Section 4 to be forest area” Act addresses preservation, protection, management, enforcement and utilization of forests and forest resources on Government land. Is applicable to FR.

Context: Forest Acts II

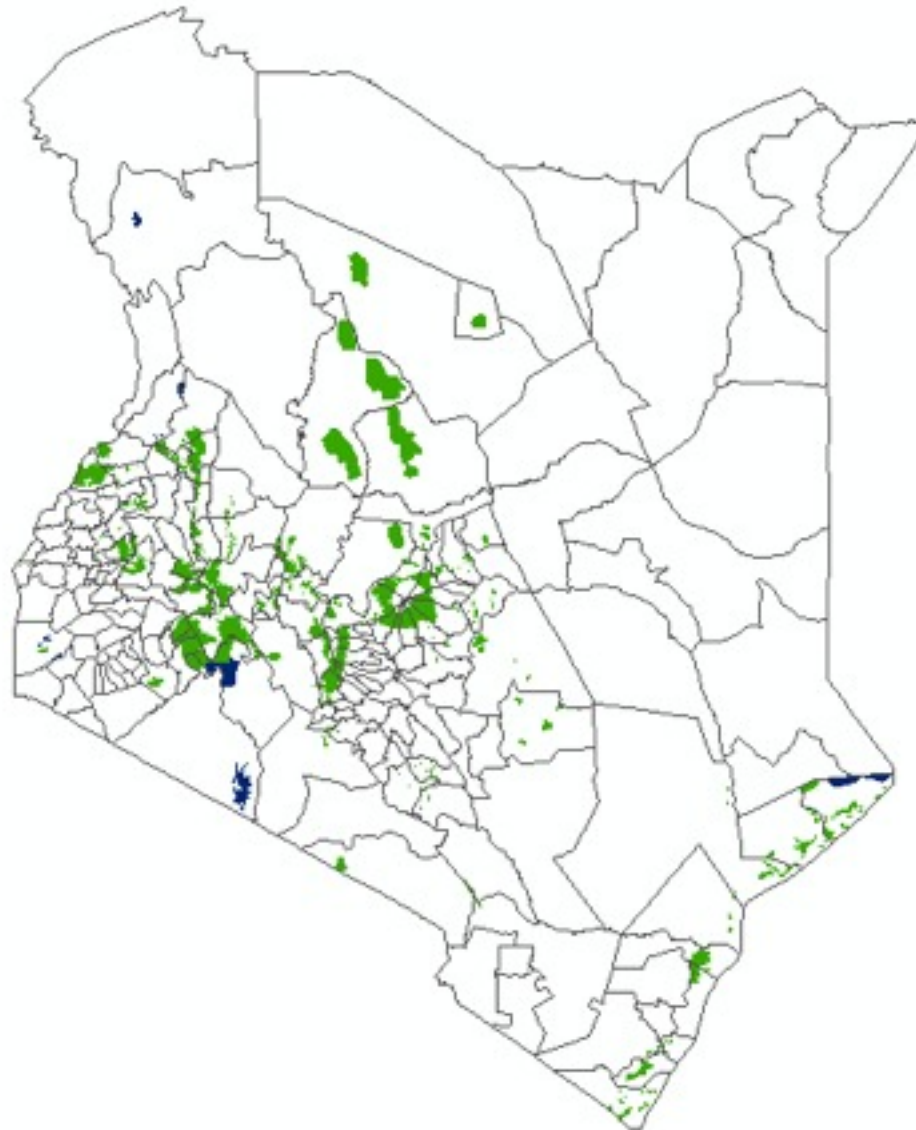
- Forest Act, Cap 385 of 1962 (revised 1982) – Section 4:
 - Allows (de) gazettement of FR.
 - The Minister may from time to time by notice in the Gazette:
 - Declare any unalienated Government land to be a forest area
 - Declare the boundaries of a forest and from time to time alter these boundaries
 - Declare that a forest area shall cease to be a forest area
 - Before a declaration is made 28 days notice of intention to make the declaration shall be published by the Minister in the gazette.

(2) legislation governing FR's remain the same pre + post 1992.

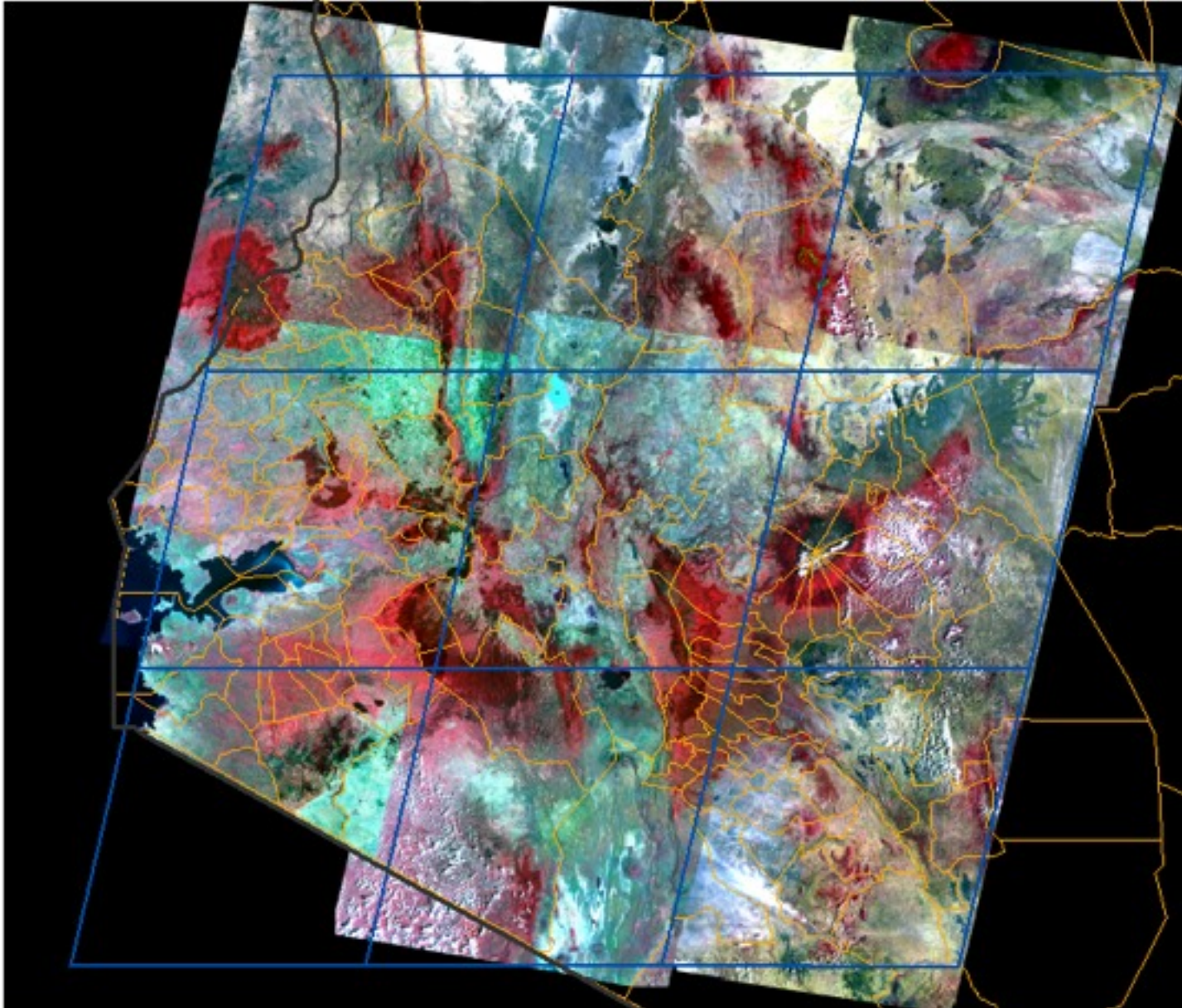
Data: *Landsat* Satellite Images

- Monitoring forest cover loss in a country with a low % of land covered by forest is challenging (large RS literature).
- Obtain access to *Landsat* programme these satellites were launched to study and monitor the Earth's surface – launch date 1972 and on going.
- Various Landsat's launched – subject to minor modification – can be used to do time series analysis.
- Resolution in the first launch at 57m – post-1986 at 28.5m – average brightness value of that pixel – higher resolution better.

Data: Spatial Distribution of Forests



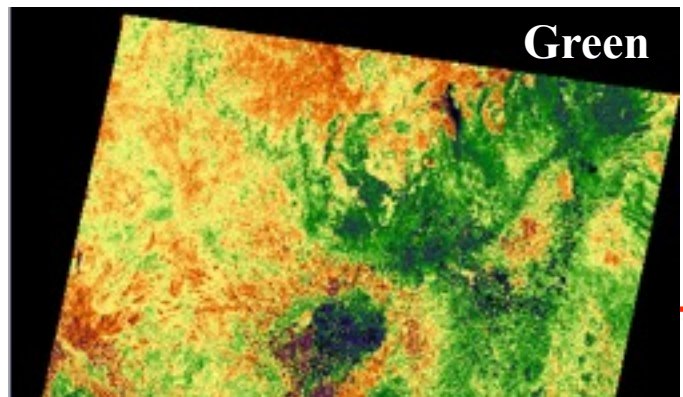
1972 -1976 FALSE COLOR MOSAIC



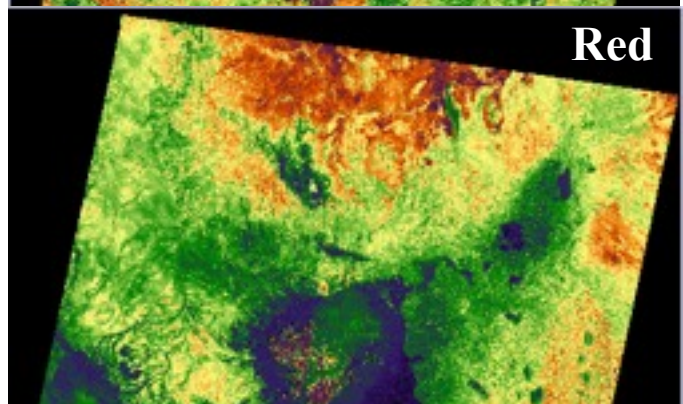
Data: Forest Cover Extraction

Procedure:

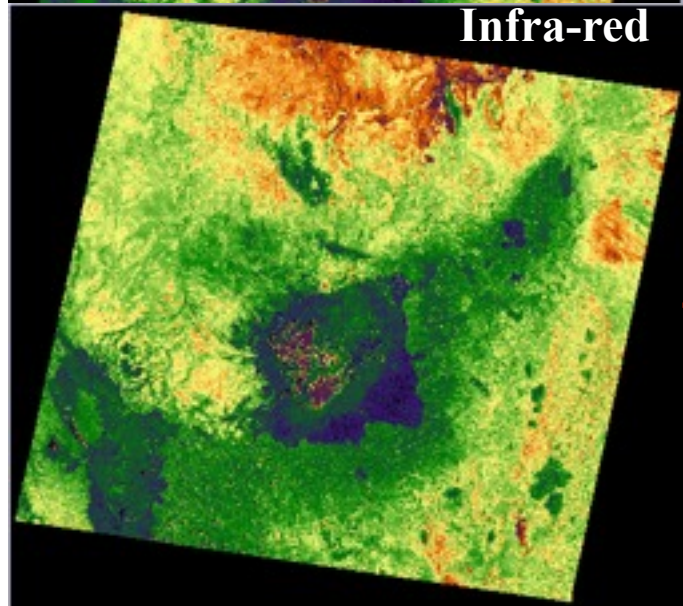
- Correct each image to uniform standard – projection, datum and pixel size.
- Geo-reference all using a base set of topography maps.
- Image composed of bands – use for environmental RS is Green, Red and Infra-red.
- On *each band* for each image – display histogram of bands and stretch each band – bands are *enhanced*.
- Obtain *enhanced colour composite images*.
- *Training site selection* on composite image - *run supervised maximum likelihood classification - manual digitisation – aided by topography maps and visits to sites.*



Green

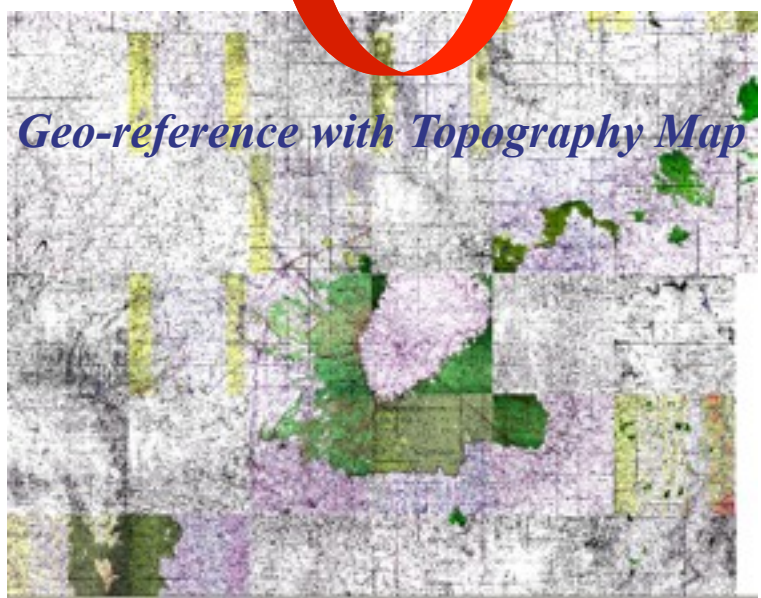
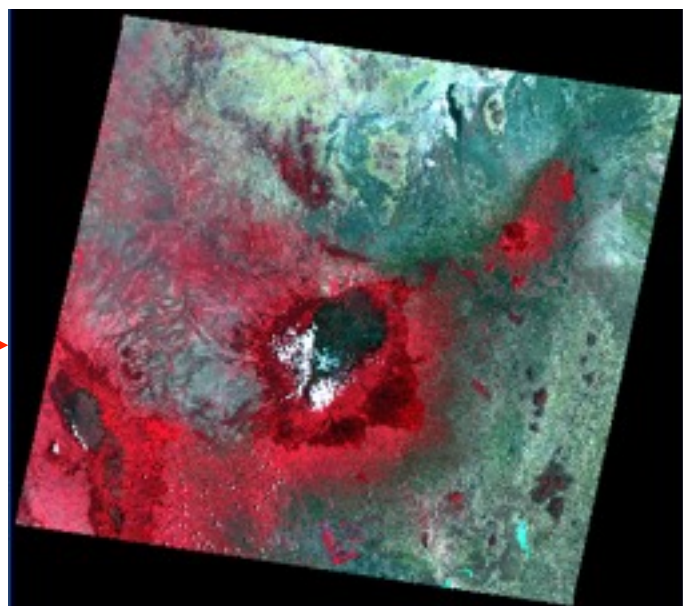


Red



Infra-red

False Colour Composite Image



Geo-reference with Topography Map

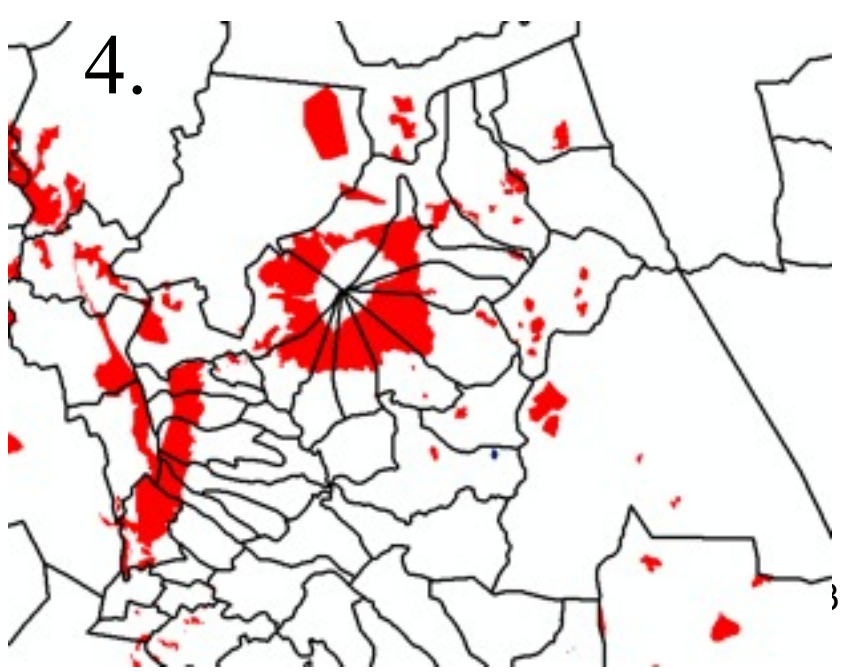
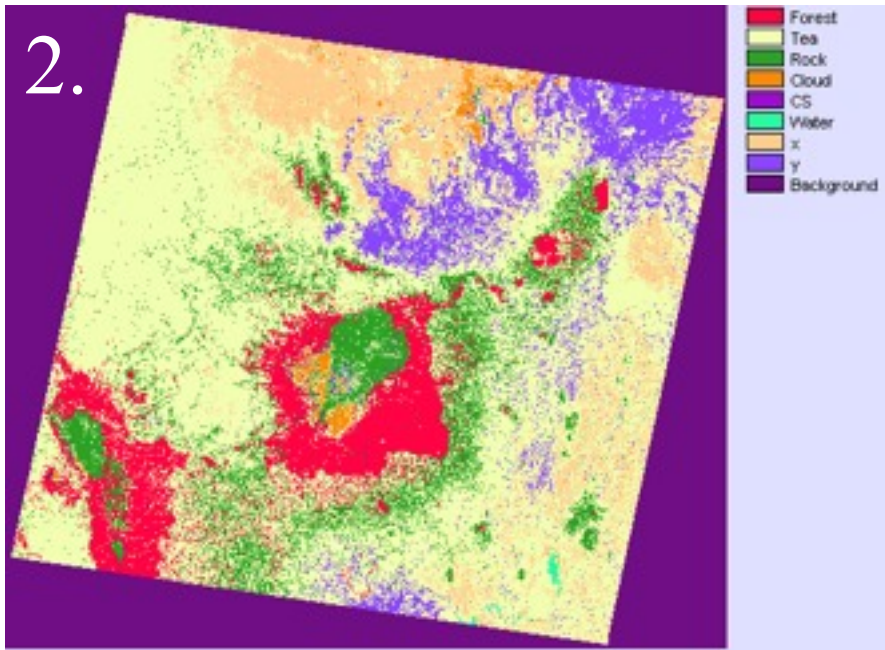
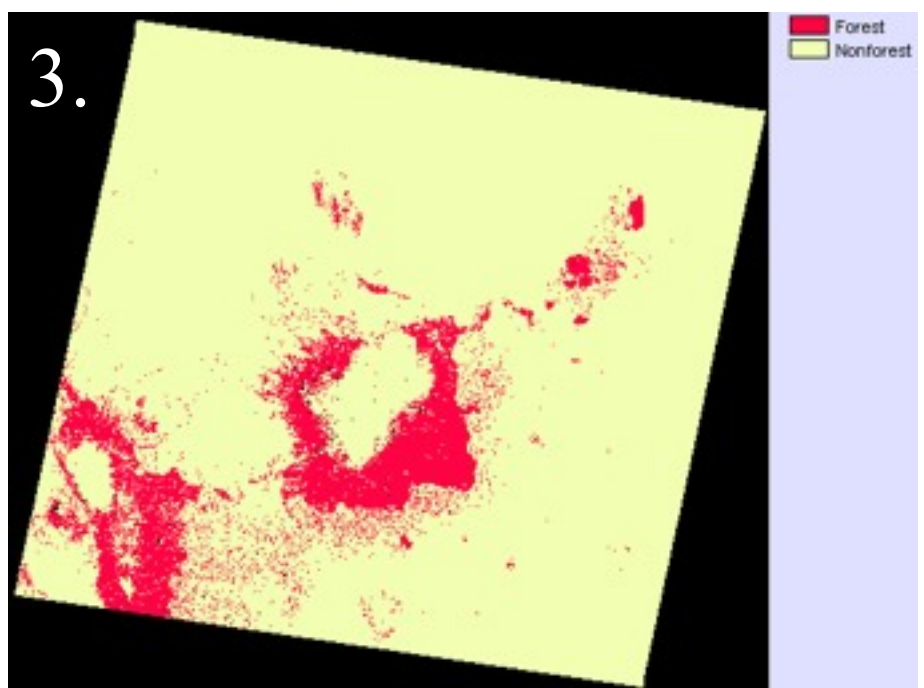
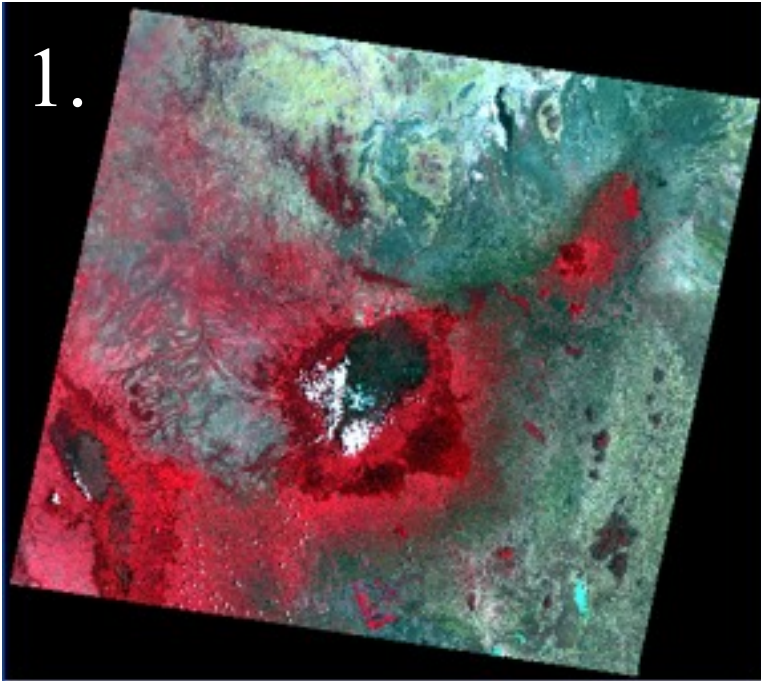
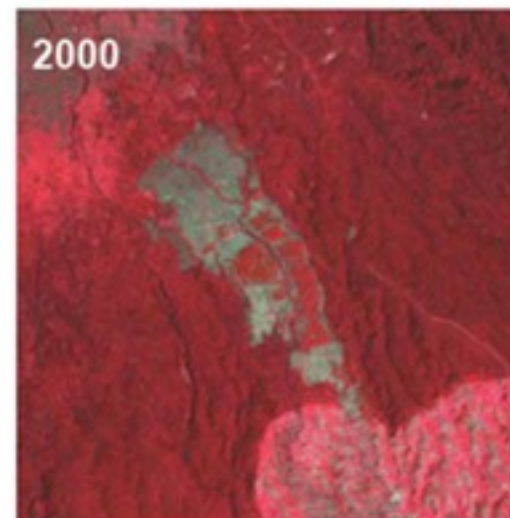
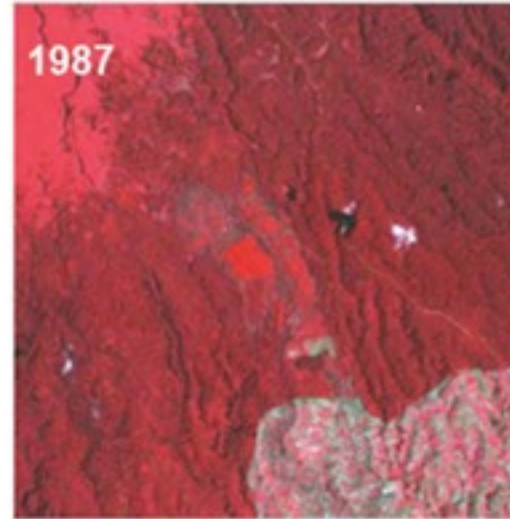


Illustration of Destruction



Concluding Remarks...

1. Encroachment of Kenyan forests widely reported both in popular press and international media.
2. Main novelty of approach is to bring new evidence to monitor resources (satellite imagery) and secondly to understand the purpose behind the distribution in both the spatial and temporal context.
3. One of the first systematic quantitative studies in Africa that tries to understand the effect of a political reform on the environment.

THANK YOU!