

FUEL SUBSTITUTION: POVERTY IMPACTS ON BIOMASS FUEL SUPPLIERS

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Historical Background

Biomass and Estab. Of Addis as a Capital (1880s)

- * Biomass major source of energy (95%)
- * Household sector major consumer (90%) of energy
- * HHE heavily reliant on biomass (98%)
- * Energy consumption per capita one of the least in the world (300kgoe) or about 2 kg of wood equivalent per day per person
- * Urban per capita 1.68 and rural 2.11 kg of wood equivalent per day per person
- * Biomass resource base very poor and managed unsustainably
- * Demanded for biomass fuels exceeded sustainable supply levels over the past few decades.
- * Annual loss of trees in the order of 150,000 to 200,00 ha; and this has been happening in the face no major afforestation efforts.
- * Land and hence trees are publicly owned which is believed to serve as a disincentive for investment on land and related developments
- * Cutting trees trees is illegal. BUT BURNING CHARCOAL AND FIREWOOD IS LEGAL



Historical Background

Biomass and Estab. Of Addis as a Capital (1880s)

- * Before establishment of Addis, Ethiopia was characterized by roving capitals
- * One of the key features of such roving capitals (with thousands of people following the emperors) was the massive pressure they put on the surrounding physical environment
- * Addis was founded as a permanent capital in 1880s
- * The new capital was about to be abandoned mainly due to firewood scarcity. However, it was saved by introduction of eucalyptus tree by emperor Menelik II.
- * However, some literature indicates that at one time the country was also exporter of forestry products to the middle east



Historical Background ...

Energy Crisis of the 70s and Government Responses

Woodfuel Crisis (early 1980s):

- Scarcity of firewood
- Steadily rising prices of traditional fuels
- HHs forced to use less desirable fuels
- Adaptation to scarcity
- Environment – slogan of the decade
- **NB: Misconceptions**
 - exaggerated contribution of HHE to environmental degradation
 - Giving trees ornamental values
 - Blaming the poor for impoverishing the environment



Historical Background ...

Energy Crisis of the 70s and Government Responses

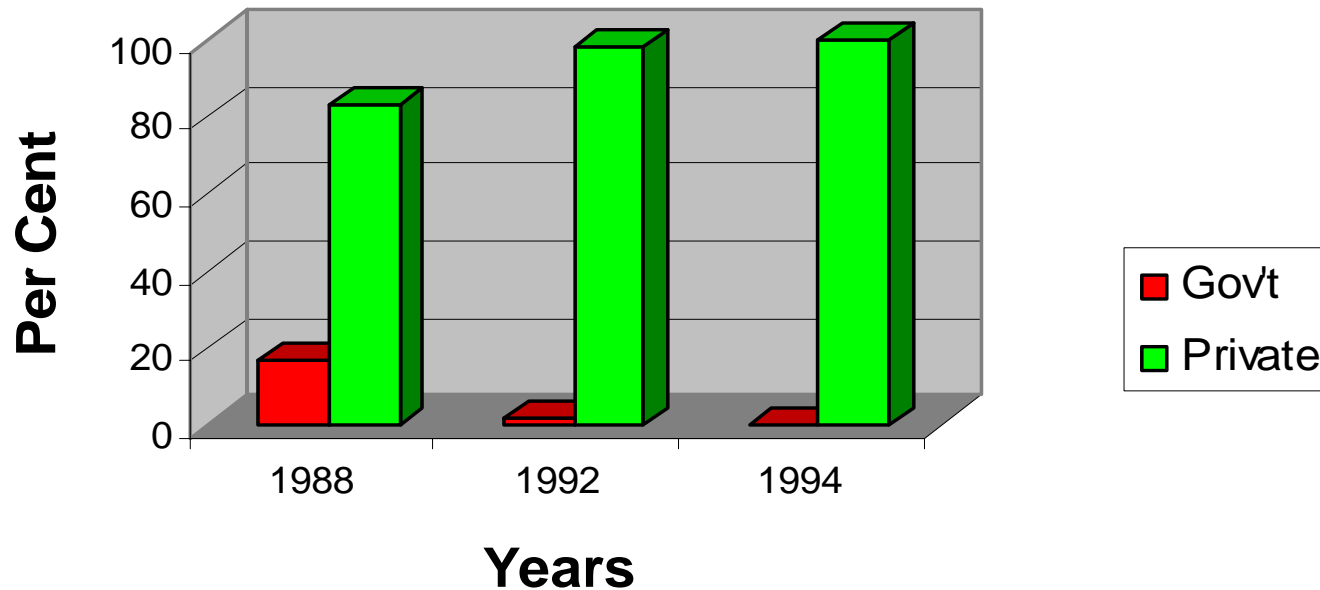
Government of Ethiopia Responses:

- Strict ban on trafficking trad. Fuels,
- Massive importation of kerosene and kerosene stoves,
- Subsidizing kerosene and electricity prices,
- Manufacture and large scale dissemination of electric Injera Mitads at subsidized prices,
- Establishment of publicly owned biomass fuels distribution network,
- Peri-urban fuelwood plantations,
- Proliferation of improved stoves programmes



Responses to the 'crisis'

Proportions of Traditional Fuels Supplied by Public and Private Sectors (1988 - 1994)



HOUSEHOLD ENERGY INTERVENTIONS

* **Supply Enhancement:**

– Large scale peri-urban fuelwood plantations:

* Examples:

- Addis-Bah
- Nazreth
- Gondar
- Dessie



HOUSEHOLD ENERGY INTERVENTIONS

Demand Management (Improved Stoves)

- Lakech Improved Charcoal Stoves
- Mirt Biomass Injera Stoves



Demand Management ...

Penetration of Lakech Stoves (1998)

Towns	HHs	%Owned
Addis	600,00	65
Dessie	18,000	55
D. Dawa	35,000	48
Awasa	20,000	46
Harar	16,000	30
Small Towns (5,000 to 15,000)		22



INTERVENTIONS ... FUEL SUBSTITUTION:

Kerosene and Kerosene Stoves:

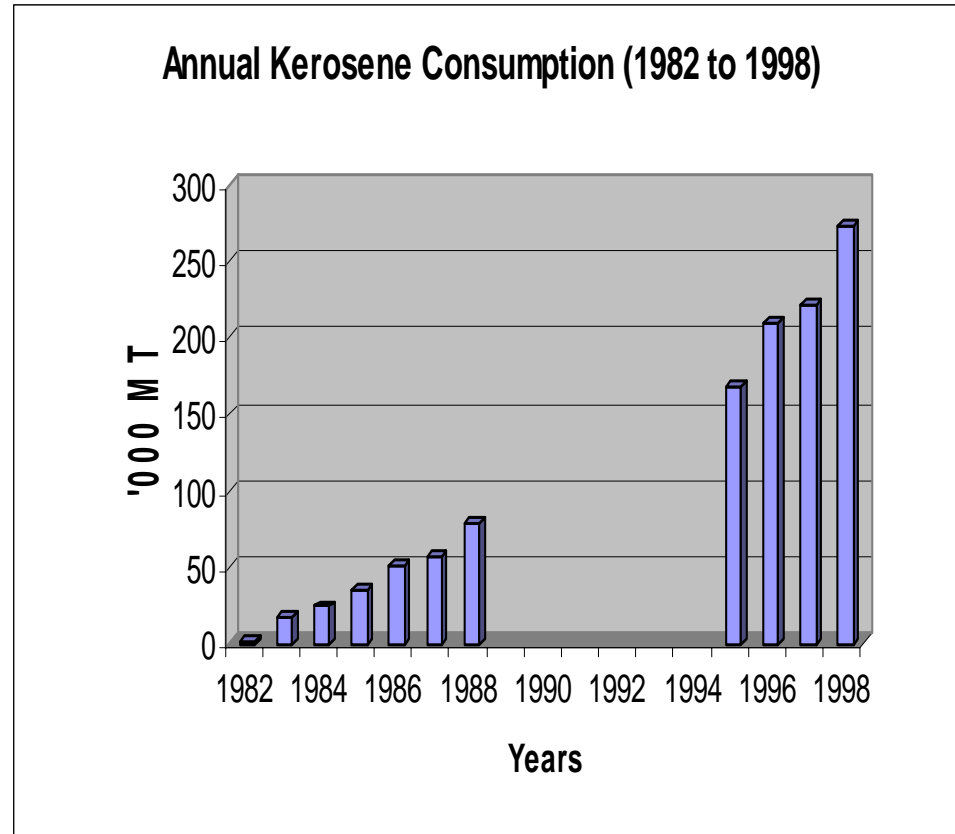
- Kerosene as a household fuel was almost unknown in the early 80s
- In response to the 'crisis', massive importation of kerosene stoves was started in 1983, import restrictions removed
- By 1986, Over 600,000 kerosene stoves in use in Addis
- Kerosene was subsidized
- Despite initial resistance, long queues were a common scene in late 80s
- Addis HHs completed transition from 'no kerosene' in 1980 to over 90% ownership by mid 90s



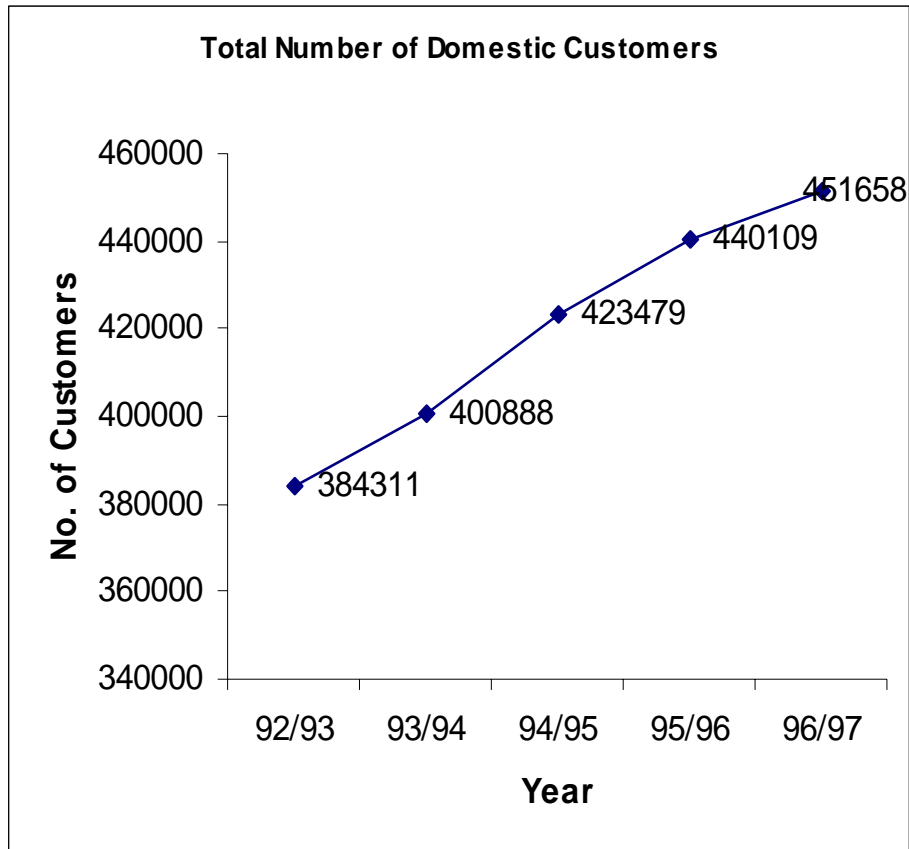
FUEL SUBSTITUTION: Kerosene Con'td

* Kerosene consumption grew by an average of about 30 per annum

* Forex requirements
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Fuel Substitution Electricity

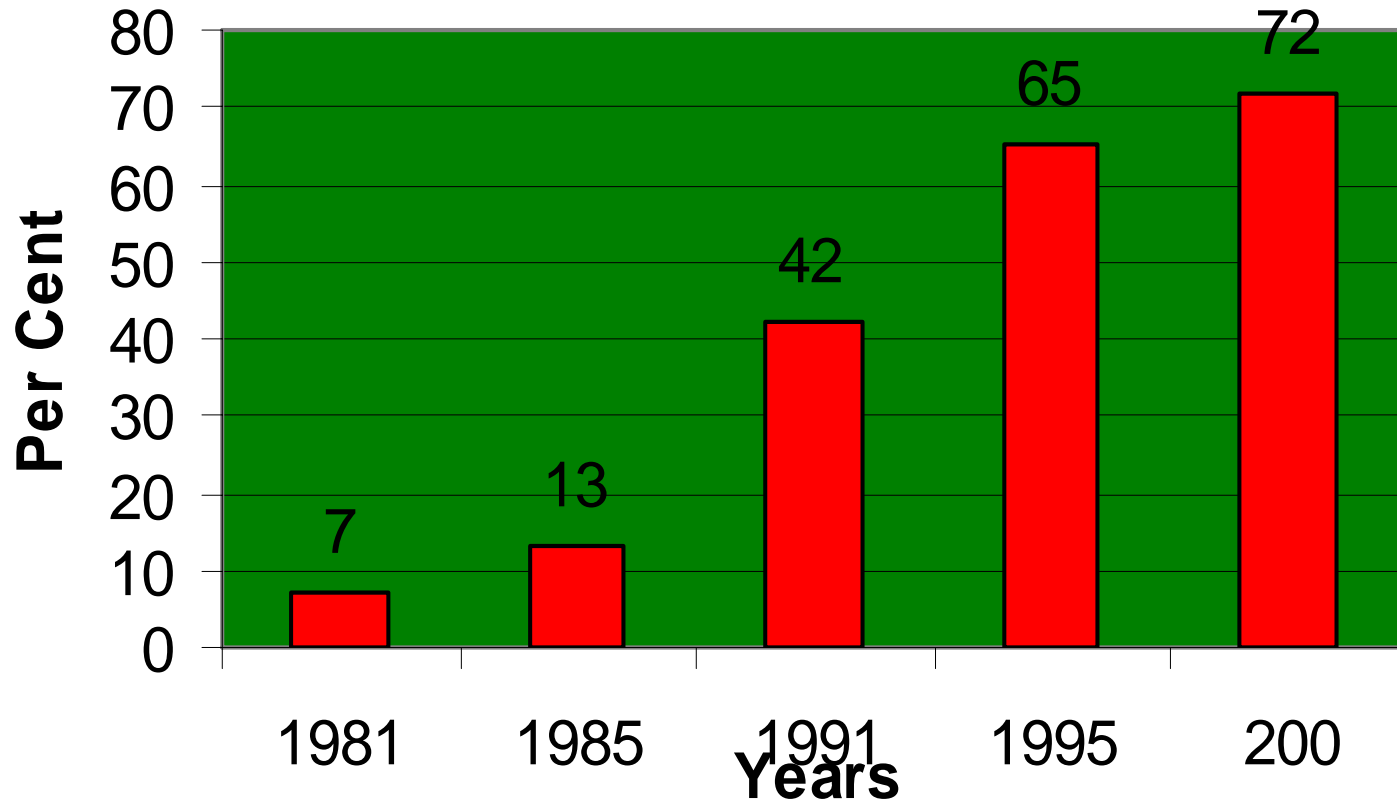


- * Demand grew by over 10% and connection by 5%.
- * Tariff structure made more progressive
- * Gradual removal of subsidy



Electricity ... Cont'd

Electric Injera Mitad Ownership and Use in Addis Ababa



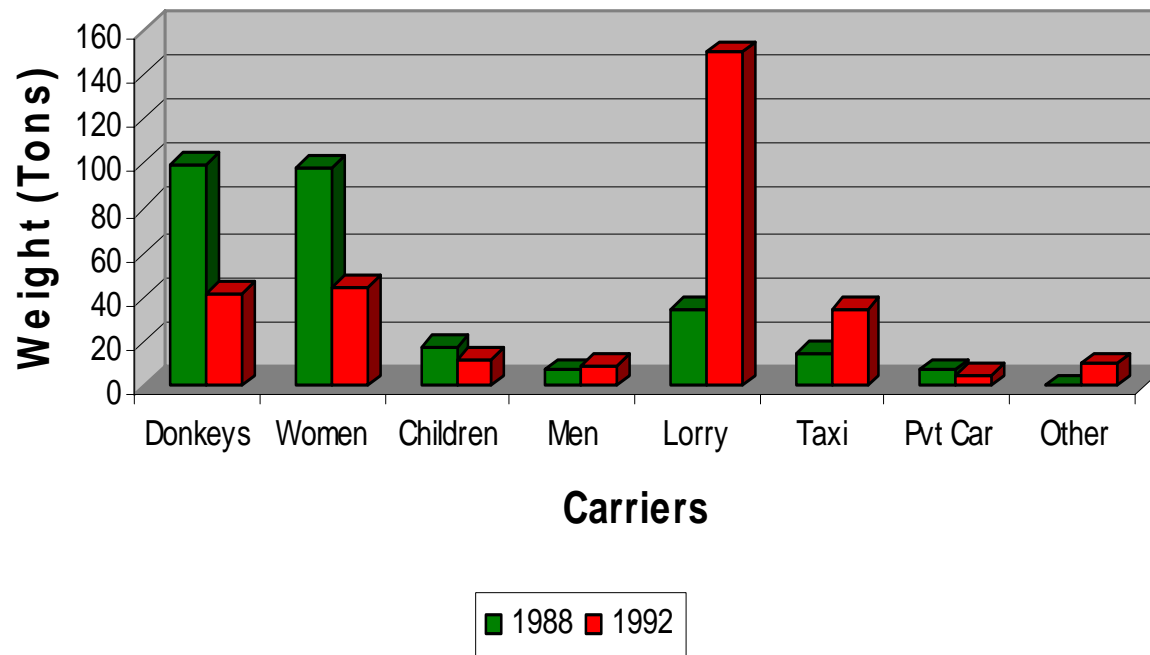
LIVELIHOOD AND POVERTY IMPLICATIONS OF PREVIOUS INTERVENTIONS

- * Demand for traditional fuels decreased?
- * Suppliers:
 - Producers
 - Transporters
 - Vendors, ... lost sources of livelihood
- * Improved Health?
- * Improved Natural Resource Base?

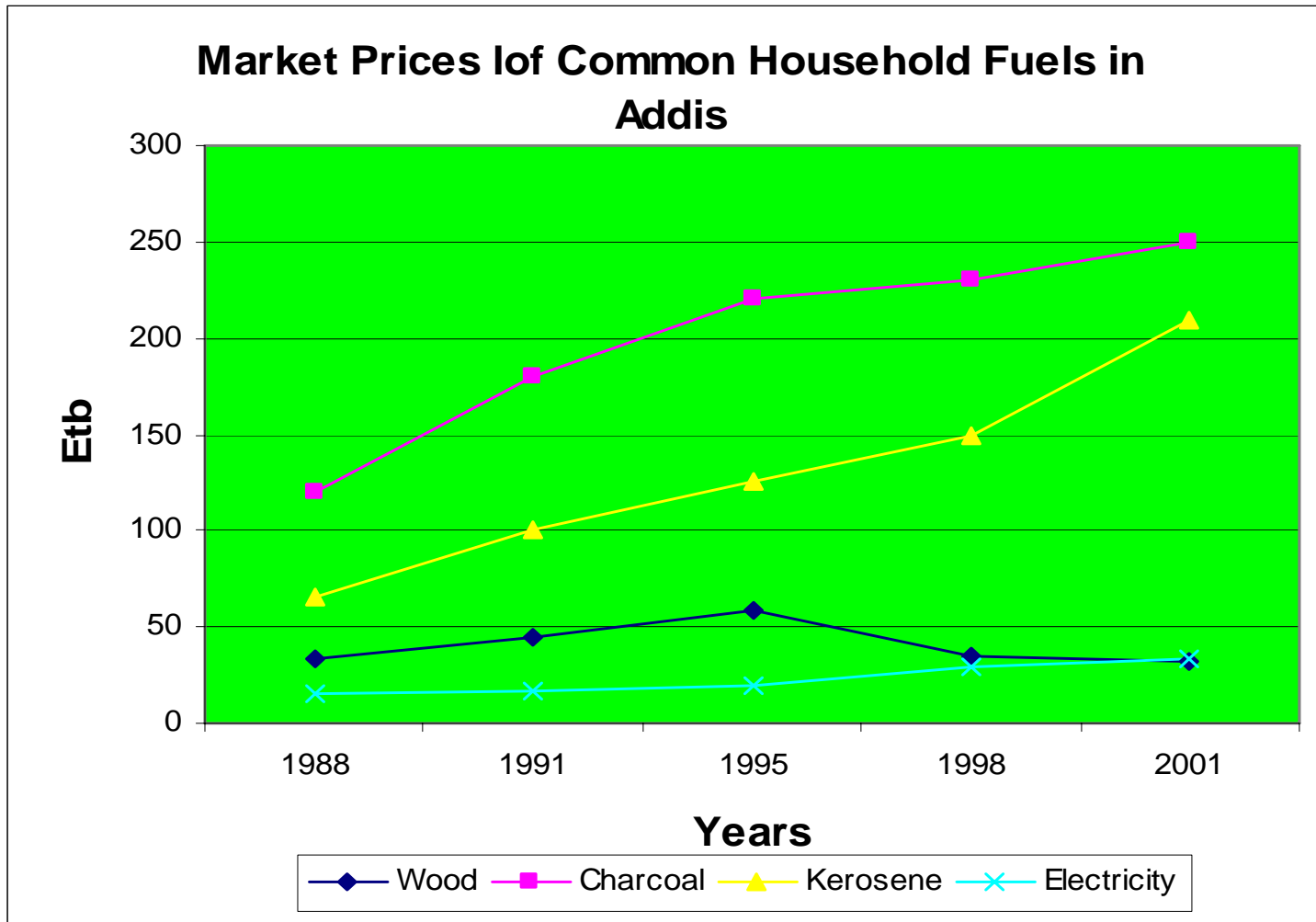


Implications

Comparison of Biomass Weight Inflow to Addis by Carrier Type (1988 and 1992)

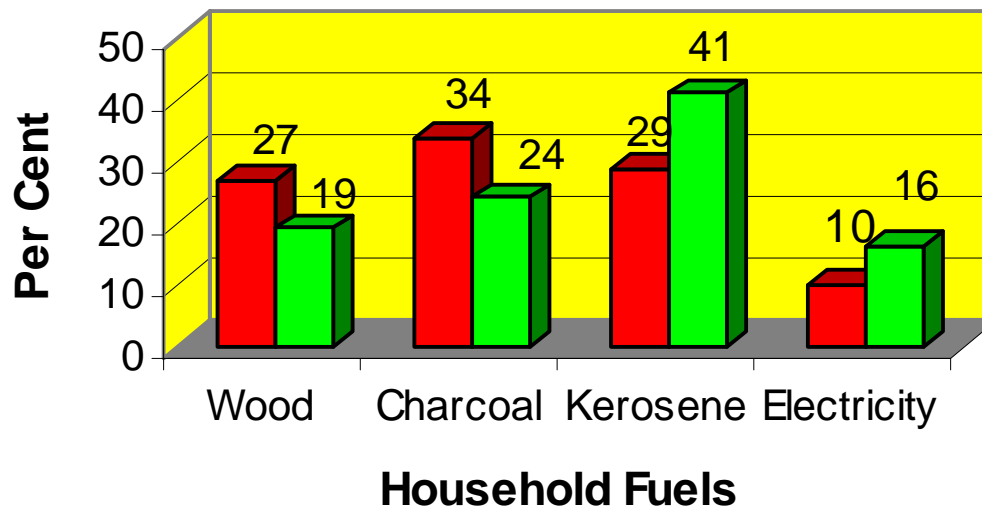


Implications ... Cont'd



Implications ... Cont'd

Trends in Fuel Substitution

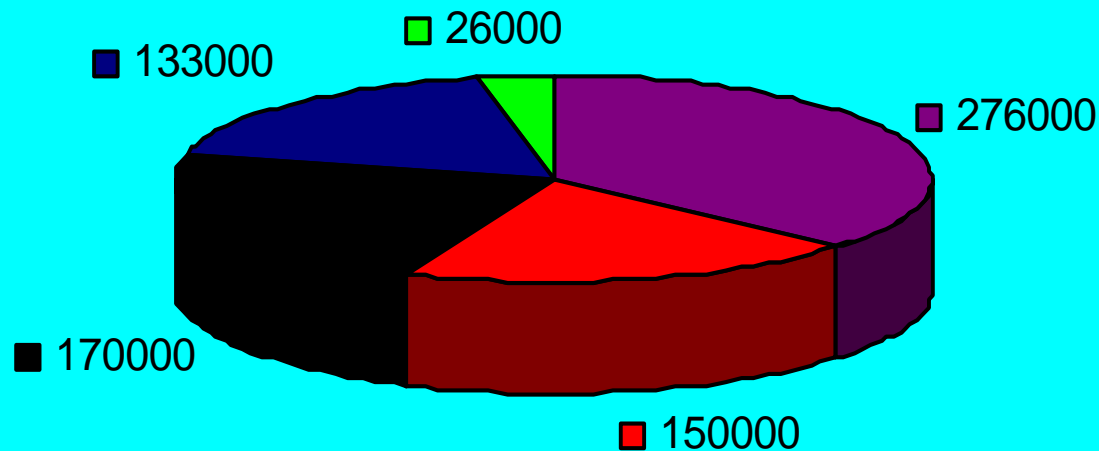


■ CEPPE '86 ■ CEINFMP '89

Implications ... Cont'd

Addis Ababa (1992)

Wood Substitution in Addis (Tons WE, 1992)



■ Kerosene ■ Electricity ■ Lakech ■ Mirte ■ Other