


Animal traction for transport in Madagascar

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 Animal Traction Development



Andrianaivoarivony and Starkey

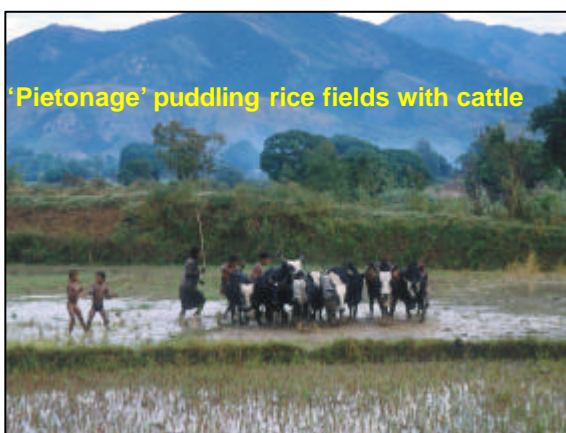
MADAGASCAR

- Population: 14 million people
- Area: 585 000 km²
- Average income per person: US\$ 375
- Economy: mainly agriculture.
- Rural population: 75 %.
- Climate: tropical.
- Rainfall: 500 - 4000 mm per year (depending on region)



Animal Traction

- Ox carts
 - 300,000, over 100 years of experience
- Pietonage (puddling rice swamps)
- Harrowing and levelling
- Plowing (mouldboard plows)
 - (not widespread, relatively recent, in 20th century)
- Horses (few < 3000)
- Donkeys (few < 100)





Plowing with oxen (mouldboard plow)



Harrowing and levelling rice fields with oxen



Traditional ox cart- central area



Caravan of traditional ox carts on main road



Donkey carrying water in the south



Small population of horses used mainly for racing, recreation and tourism

Horse stage coach, Antananarivo





MITA

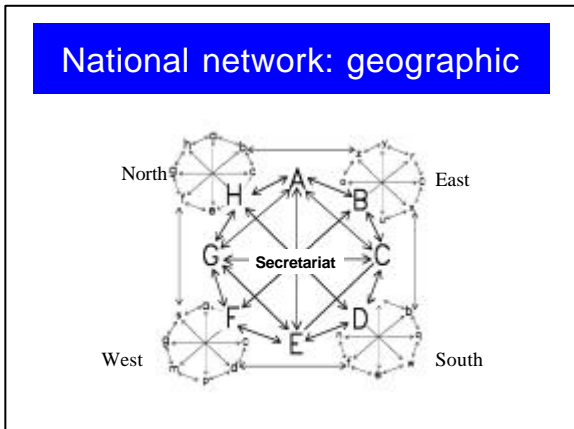
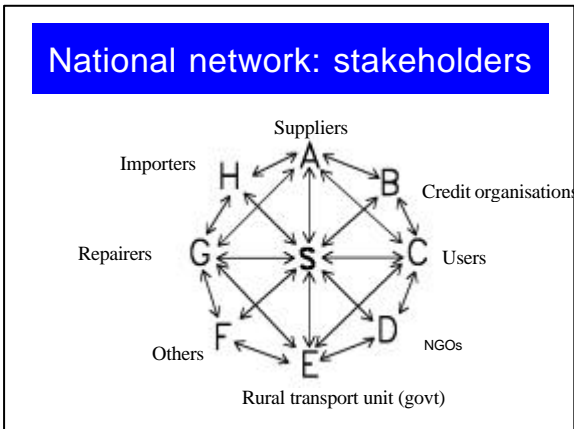
- **MITA**
Réseau malgache de développement des moyens intermédiaires de transport
Madagascar Network for the Development of Intermediate Means of Transport (IMTs)
- **Moyens Intermédiaires de Transport Améliorés** *(Improved IMTs)*
- **MITA** *(Malagache word)*
'Passing through, overcoming obstacles'

Transport Sector Programme

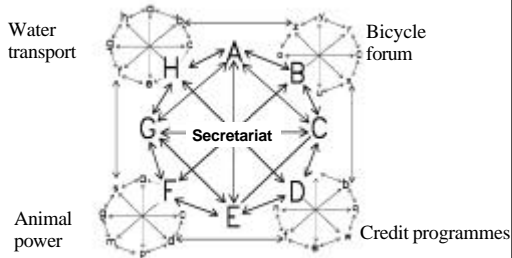
- ≠ National investment programme in transport
- ≠ Part to improve intermediate means of transport
- ≠ Emphasis on
 - Cycle based technologies
 - Animal traction (especially ox carts)
 - Water transport
 - Hand carts, wheelbarrows and rickshaws (also credit promotion, small infrastructure, policy, safety and other issues)

MITA network of partners

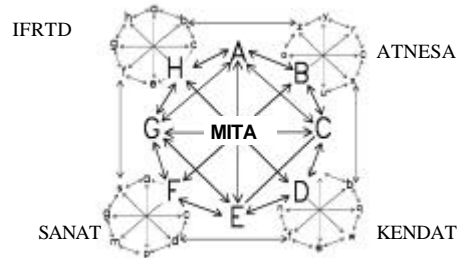
- Government
- National NGOs
- International NGOs
- Credit organisations
- Private sector: manufacturers, importers, workshops etc.
- Public services (training, research, extension, media)
- User and/or operator associations
- The rural transport unit (national transport project) is an influential member of the MITA network, but it does not control it.



National network: thematic



International networking



Animal traction programme

- Small projects of promotion of ox carts implemented by NGOs
- Adaptive research (NGOs), on cart design and wheel technologies
- Improving credit (with credit agencies)
- Information exchange and training
- Promoting suitable policies

Ox carts in Madagascar

	1985	1998
Antananarivo	70 793	91 479
Fianarantsoa	9 652	8 523
Toamasina	12 505	14 436
Mahajanga	60 195	70 659
Toliary	70 495	79 158
Antsiranana	11 048	23 822
MADAGASCAR	234 688	288 076



Ox cart with metal wheels in northwest carrying boat



Ox carts with pneumatic tyres southwest



Ox cart transport in Madagascar

Price (central area)	\$US 280
Pair of oxen	\$US 350
Days used per year	84
Average distance	22 km
Average load	560 kg outward 250 kg return
Transport revenue	\$US 1 per tonne-km
Life of cart	19 years



Ox carts are important to go to and from market

Traditional ox carts make ruts in roads



Transport professionals want to ban traditional wheels

Woman responsible for a small workshop making traditional ox carts





Local artisans make cartwheels in the villages



Making traditional wheels: heating the metal rim



Making traditional wheels: fitting the hot metal rim



Making traditional wheels: cooling the metal rim

Advantages of cartwheels

Users and farmers say wooden cartwheels are:

- Cheaper
- Easily available in the villages
- Puncture free
- Long-lasting (twenty years)
- Very good brakes
- High clearance for poor roads and for water
- People can push on spokes
- Right sound (people can hear them coming)



Ox carts with large wheels can operate on bad roads



Use of pneumatic tyres

- Does not damage road
- More comfortable (for people, and 'ambulances')
- Better in sand
- Easier to pull
 - Used with human carts, single oxen, donkeys
- Mainly used near capital (availability) and in south (carrying people, sandy conditions, small oxen)



Donkey comparative advantages

Advantages

- Considered more powerful than oxen
- Faster
- Low risk of theft (big problem with cattle in the south)
- Adapted to arid climate in the south

Disadvantages

- Very rare
- Expensive (more than cattle!) as rare
- People unfamiliar and lack knowledge
- Social problems – some taboos
- Stall feeding necessary as free range difficult as neighbours hate them!

Donkey cart in the South

(the yoke is not appropriate, but there is limited local knowledge on donkey technologies)



Visit to the owner of a donkey cart used for village transport and preferred as an 'ambulance'



Influencing policy
Moving from prohibition to special ways



Complementarity
Lorries and ox carts share the same road



Thank you!
Misaotra!
Welcome to Madagascar!