

Impacts of fire and its use for sustainable land management in Indonesia and Northern Australia



Early dry season fires in progress. Doramelli - Flores, 2003.

In eastern Indonesia (NTT), the breakdown of traditional fire management practices has, in many areas, contributed to declining land productivity through direct impacts on plantations and crops, soil loss and nutrient depletion, and associated water catchment degradation. A core issue concerns the reconciliation of national fire policy with on-ground reality that fire management is an integral, if little understood, component of most savanna farming systems.

Northern Australia and NTT have many similar fire management issues, especially given the geographical/climatic context of savannas fires. In NTT and northern Australia a key common issue is the application of appropriate fire management in pastoral production.

This project is focusing on three main research areas:

Environmental

- There is a need to understand and map real extent of burning throughout NTT.
- Using satellite imagery fires are being mapped over the study period.
- Satellite based vegetation and land use maps are being developed to integrate with on ground surveys.

Social/Cultural

- There is a need to understand the social and economic impacts of changing land management and fire use techniques.
- Using Participatory Rural Appraisal local community groups are brought together for discussions and surveyed to build a picture of the changing nature of their relationship to the land and fire.

Management Practice

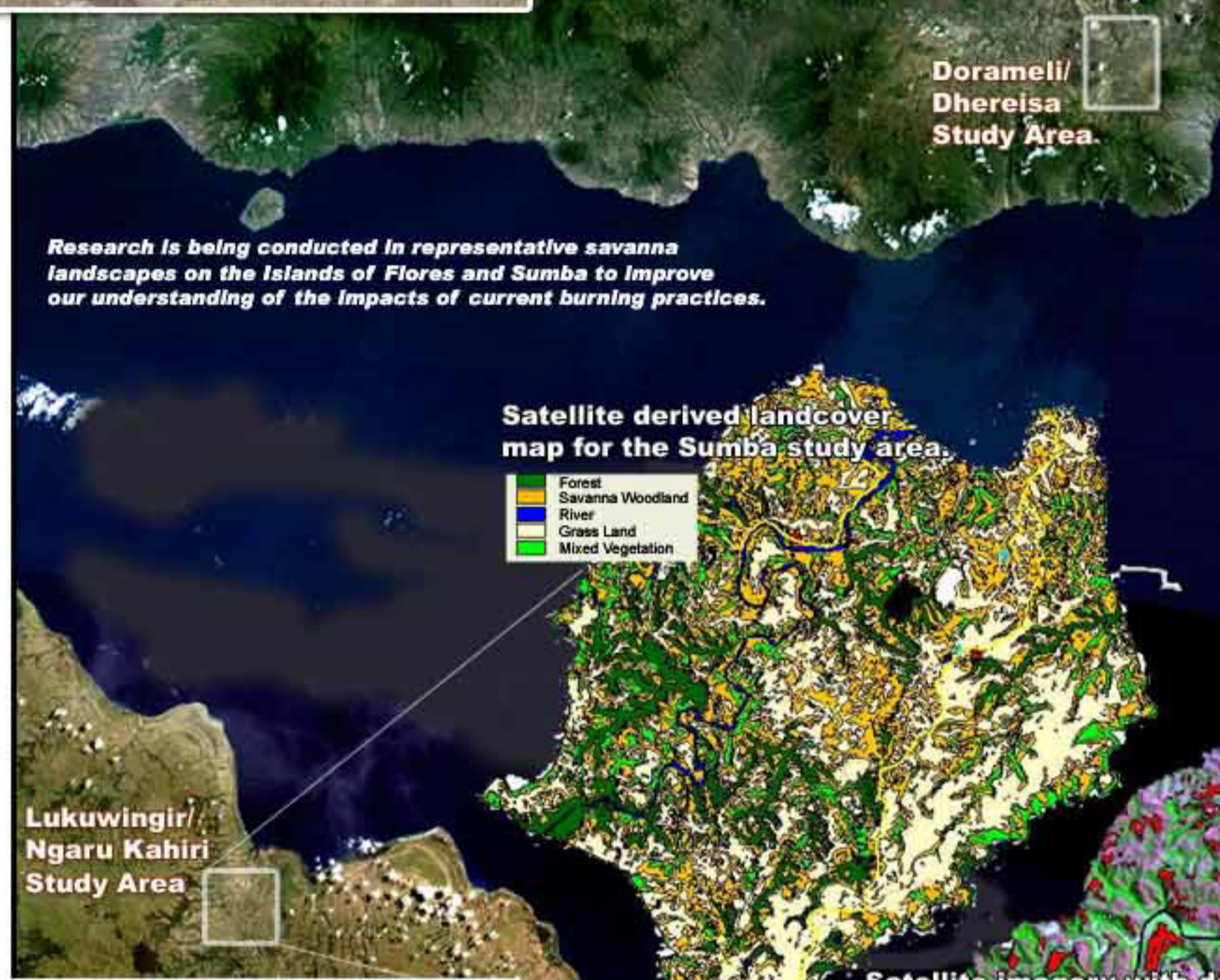
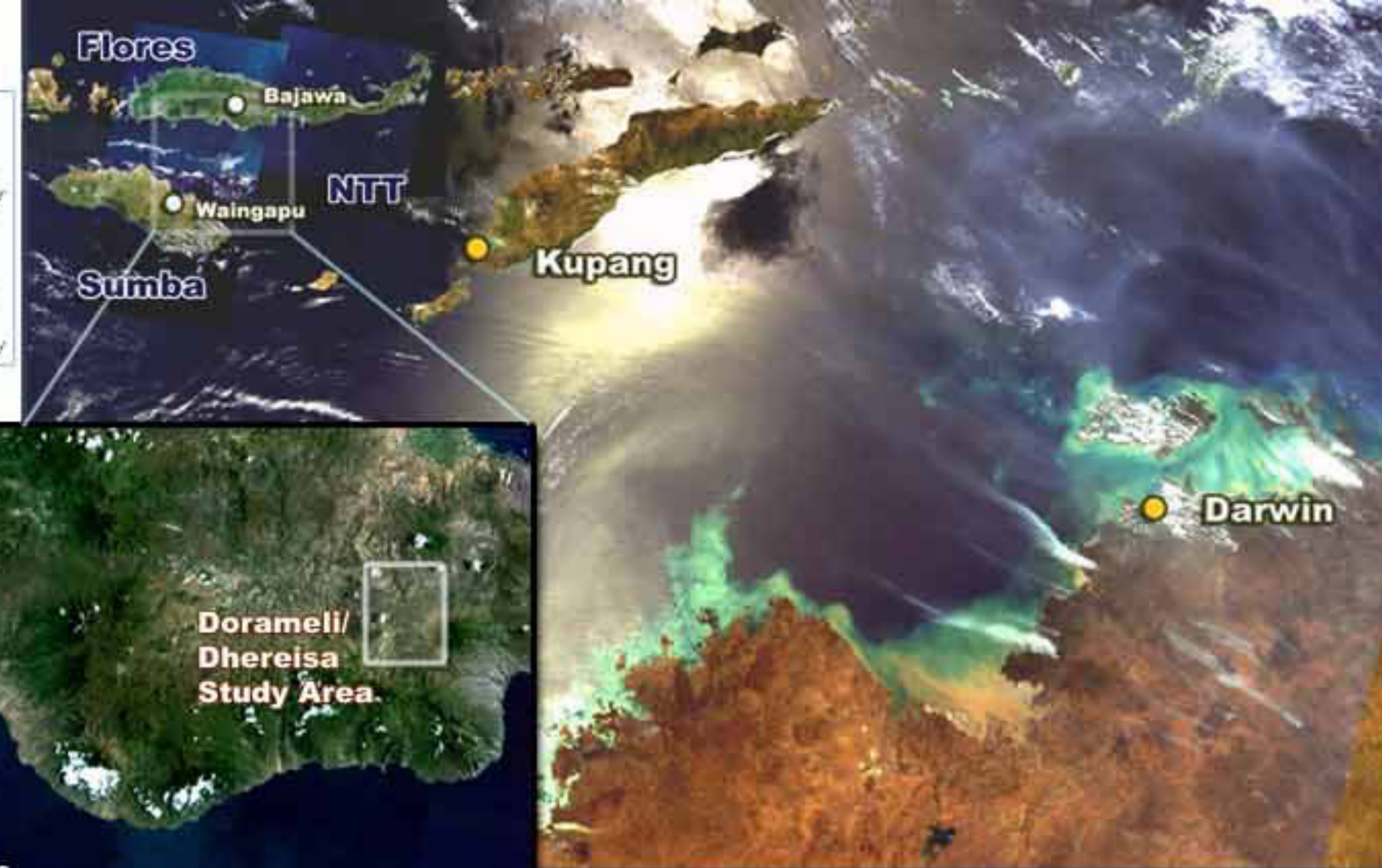
- Currently there is inadequate information concerning the potential benefits of alternate fire management practices in a variety of resource management and production system contexts.
- Demonstration plots are being developed to illustrate alternative fire management techniques.

The information from this research will be used to inform a review of policy on legislation related to fire management across Australia and Indonesia.



Burnt landscape, late dry season. Lukuwingir - Sumba, 2003.

This poster presents some aspects of the research component of this project in Eastern Indonesia (East Nusa Tenggara, NTT). Major on ground focus areas and some initial findings are presented. For more information about the project check: <http://fireindon.ntu.edu.au/>



Research is being conducted in representative savanna landscapes on the islands of Flores and Sumba to improve our understanding of the impacts of current burning practices.

Satellite derived landcover map for the Sumba study area.

- Forest
- Savanna Woodland
- River
- Grass Land
- Mixed Vegetation

Lukuwingir/ Ngaru Kahiri Study Area

Satellite imagery with derived fire scar mapping in red for October 2002.

Landscape Mapping

Satellite imagery is being used to map fires and vegetation within our study areas.

Current mapping indicates that around 50% of the study area in Flores and 19% of the study area in Sumba are burnt each year.

Detailed fire scar mapping will continue over the next two years. Analysis of these data using the land cover and social/cultural data will provide a picture of the regional burning patterns and provide valuable insight into causes and impacts.



Fire - Sumba August 2003.



GPS - Training.

Establishment of demonstration plots.

Demonstration plots are being established at each of the study villages to demonstrate different farming and fire management techniques.



Collecting Seed



The Nursery.

Agro-forestry skills from Indonesian and Australian project staff are guiding the establishment of nurseries and planting programs.



Planting the initial agroforestry demonstration plots - Doramelli, Flores.

In developing alternative farm income we hope to encourage more strategic use of fire in land management.

Learning from the local community.

Focus Group Discussion, questionnaire forms and participatory mapping techniques are being used to gather information about:

- * Current land use patterns.
- * Change in land use.
- * Cultural, economic change.
- * Perceived problems with current land management and potential solutions.



Participatory mapping - Flores.

There has been a steady increase in the perceived frequency of fires between 1970 and the present.

Some possible causes are:

- * Increased value of some forest products encourages the use of fire to create easier access.
- * Increased population pressure
- * Less consideration being given to protecting traditional/ sacred places from fire.



Traditional hunters learning about mapping with GPS, Flores.

Fire related problems

Economic

- * extinction or depletion of forest products of economic value (e.g. timber, sandal wood, cockatoo, kutu lak for varnish)
- * extinction or depletion of forest products used by households (e.g. roots, fence materials, coarse grass and timber)
- * decreasing farm productivity and soil fertility
- * reduction in cultivated land
- * increased household expenditure because of shortage of forest resources

Socio-cultural impacts

- * changes in building materials and house design
- * competition for use of productive land



Focus group discussion, Kiritana, Sumba.



Wet season landscape Lukuwingir - Sumba.

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Dry season burnt landscape Doramelli - Flores.