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Institute for the Advanced
Study of Sustainability
Traditional Knowledge Initiative



Australian Government

OVERVIEW OF THE **INTERNATIONAL SAVANNA FIRE MANAGEMENT INITIATIVE**

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Summary

Traditional fire management (TFM) recognises indigenous people have been managing the land for generations by lighting low-intensity, early dry season fires to create fire breaks and prevent the build up of ground vegetation. If left alone, this build up leads to later, dry season destructive wildfires.

The International Savanna Fire Management Initiative is an Australian Government funded project. It draws from the successful Australian experience of methodology based, community led savanna fire management. Through the sale of carbon credits generated, this type of savanna fire management has created incomes for remote indigenous communities, reduced emissions and protected biodiversity in the tropical north of Australia.

The United Nations University (UNU) initial assessment in this two-year project is showing that this traditional approach to land management is globally relevant and has the potential to be applied to other regions. This summary provides a brief outline of the initial key findings of the assessment and the next steps.



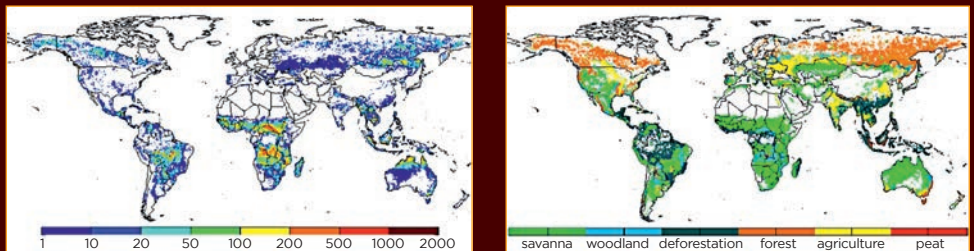
Wildfires annually burn a total land area equivalent to India and Pakistan, or more than half of Australia

1. GLOBAL IMPACT OF WILDFIRE

Wildfires annually burn a total land area of between 3.5 and 4.5 million km², equivalent to India and Pakistan together, or more than half of Australia. Wildfires affect every region of the world. Reported losses generated by wildfires over the past decade (2002–2011) were on average US\$2.4 billion per yearⁱ. Wildfires have been estimated by the Economics of Ecosystems and Biodiversity (TEEB), an ongoing international endeavour to highlight the economic benefits of biodiversity, to destroy ecosystem services in the range of US\$146–US\$191 billion per year.

The latest Intergovernmental Panel on Climate Change (IPCC) assessment (5AR) concluded that wildfires represent an important source of greenhouse gases. The latest research estimates that globally landscape and biomass fires contribute CO₂ emissions of between 2 and 4 Pg C yr⁻¹, 60% of which comes from grassland/savanna/woodland. This is equivalent to between 12–24% of emissions from fossil-fuel combustion in 2011, or 3.8–7.7 Gt CO₂e yr⁻¹ⁱⁱ. The IPCC in 5AR concluded that impacts from wildfires reveal significant vulnerability and exposure of some ecosystems and many human systems to current climate variability. The IPCC also highlighted the greater likelihood of injury and death due to more intense fires and major health impacts of climate change throughout the 21st Century.

The maps shown in figure 1 illustrate the amount of carbon emitted from wildfires each year and the dominant type of wildfires.



Annual fire carbon emissions (gCm⁻²year⁻¹)

Dominant fire type

Figure 1ⁱⁱⁱ

Fire dependant ecosystems such as tropical dry forests and savannas cover around one-sixth of the global land surface. A major problem in these landscapes is that poor fire regimes result in the prevalence of large destructive fires that emit more greenhouse gases than well-managed areas.

The prevalence of wildfire is predicted to increase as a result of climate change. As illustrated in figure 2, NASA predicts that global fire activity could increase by between 5 and 35% by 2100 and that most of these increases will take place in these fire dependent landscapes.

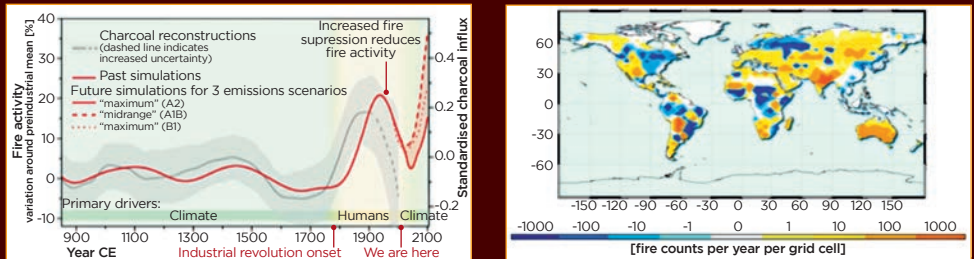


Figure 2^{iv}

The history of fire dependant landscapes around the world is remarkably similar. Originally, all of these landscapes were dominated by fire regimes that were actively managed by the indigenous people. They lit low-intensity, early dry season fires to create fire breaks and prevent the build up of fuel, which minimised later dry season destructive wildfires. The stability of this fire regime at a global scale is illustrated in NASA's global fire activity variations map above, where fire activity was constant between 850 until 1750.

After Europeans colonised these landscapes, the fire management activities of indigenous people were suppressed for a variety of reasons. This resulted in an increase in late dry season fires and an increase of fire activity between 1750 and 1950. Since the 1950s, fire activity has dropped globally, which reflects the conversion of savannas and tropical dry forest to western style agriculture, such as cattle ranching, soya bean and palm oil production.

Fire dependant ecosystems cover around one-sixth of the world's land surface

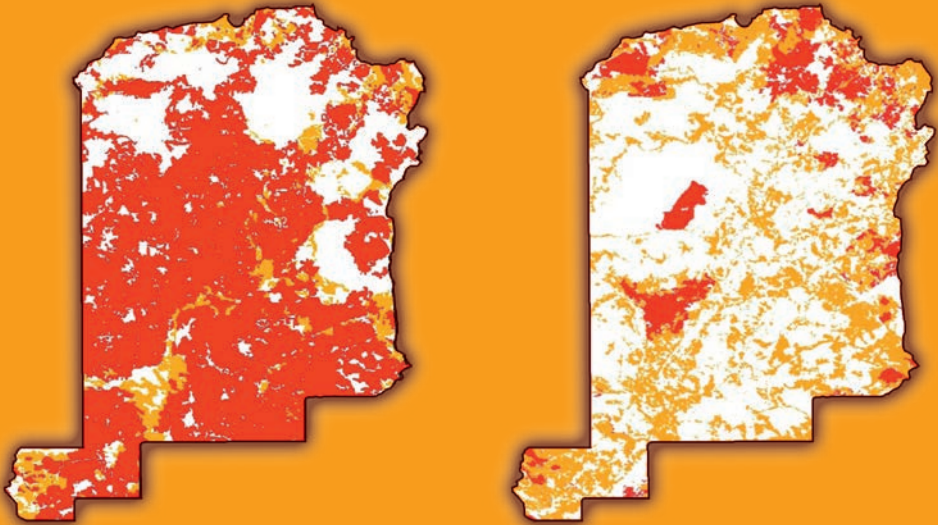


2. SAVANNA FIRE MANAGEMENT IN AUSTRALIA

Australia is leading the world in terms of experience in managing wildfires and understanding the role that fire plays in climate change. In Northern Australia, Aboriginal people have managed land for generations by using TFM.

The first project to use TFM to generate carbon credits was the Western Arnhem Land Fire Agreement (WALFA) which started in 2006. The images below for Western Arnhem Land illustrate the impact of the reintroduction of traditional fire management practises.

WALFA Project area before reintroduction of TFM in 2005 and after in 2009 with red areas being burnt late and orange early.



Early



Late

Figure 3

Under the Australian Government's Emissions Reduction Fund, there are now over 35 TFM projects that have been approved in Australia by the Clean Energy Regulator, with 14 either indigenous owned or involving significant indigenous involvement.

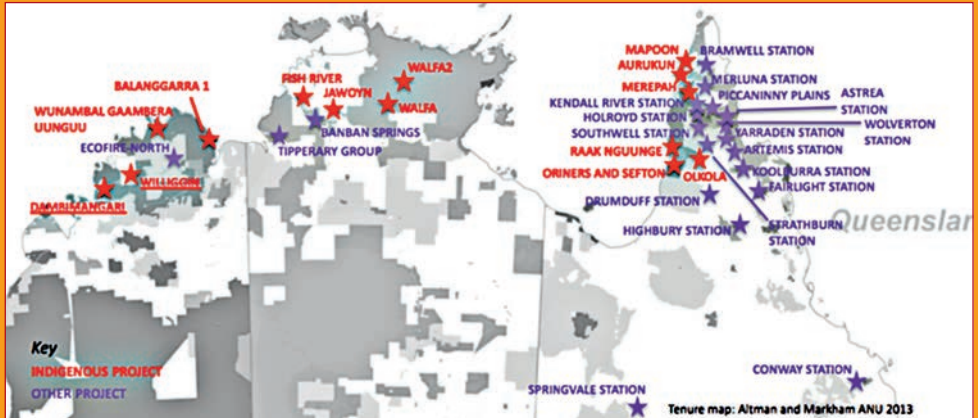


Figure 4

The application of TFM has also generated substantial co-benefits including creating market based jobs in remote and vulnerable communities, improving biodiversity, reinvigorating culture, improving food security and health.



The prevalence of wildfire is predicted to increase as a result of climate change

3. GLOBAL ASSESSMENT

With support from the Government of Australia, UNU is undertaking a two-year detailed assessment of the feasibility of transferring Australian-developed savanna burning approaches to reduce greenhouse gas emissions in other countries including in Asia, Africa and Latin America.


The Assessment, which is due to be completed in 2015, is already producing many outcomes, including:

- Learning tools, workshops and learning exchanges in and among three main savanna regions of the world – Southern Africa, Latin America and Asia;
- Feasibility assessments focused on these potential regions of the world; and
- Exploration of market interest in this approach.

Highlights of these activities include the following events;

Indigenous Perspectives Workshop and Asia Fire Workshop in May 2015 in Kupang, Indonesia. These two workshops aimed to: explore the trends, challenges and possibilities for emissions reduction savanna fire management in Asia; connect governments, civil society, indigenous people's organisations, intergovernmental organisations, research institutions and the private sector concerned with savanna fire management in Asia; and support the Initiative's Asia Regional Assessment. Participants including indigenous representatives came from Australia, Indonesia, Papua New Guinea and Timor-Leste. The workshops provided a major input into the feasibility assessment being undertaken for Asia.

African Fire Learning Exchange and Southern African Regional Fire Workshop in December 2014 in Namibia. Organised with the non-governmental organisation Integrated Rural Development and Nature Conservation (IRDNC), the learning exchange field trip explored savanna burning practices in north-east Namibia. The workshop enabled a broader audience of Southern African officials, scientists and non-government organisations to hear about outcomes from the learning exchange and share information about their own fire management context and experience. Approximately 30 participants attended including representatives from Angola, Australia, Botswana, Brazil, Mozambique, Namibia, South Africa, Tanzania, Zambia and Zimbabwe.



Australia is leading the world in managing wildfires and understanding the role that fire plays in climate change

Fire Management Study Tour of Northern Australia in May 2014 which began in Darwin. This study tour and learning exchange hosted eight representatives from a range of federal and state agencies and parks in Brazil as well as the German organisation for international cooperation GIZ. The group visited West Arnhem Land and the Kimberley and heard from several agencies, scientists and organisations across the Northern Territory and Western Australia.

The tour enabled Brazilian delegates to learn and exchange information about topics such as: fire management, planning and cooperation between government and other agencies; Australian fire science and research; biodiversity standards; fire management planning in protected area; legislative and policy approaches; indigenous governance and traditional knowledge. The study tour was followed up with further visits by Australian and African experts to Brazil, the initiation of PhD level research by Brazilian students in Australia. The study tour inspired the Brazilian government to begin compiling indigenous fire knowledge and fire use in two fire management pilot areas in Terra Indigenou.

Savanna Fire Management and Sustainable Livelihoods in Developing Countries Meeting in May 2013 in Darwin. The workshop was an important opportunity for international participants to hear from those responsible for initiating and implementing the Australian savanna burning projects, including indigenous rangers and other members of the indigenous communities involved. International participants also visited Fish River Station in the Northern Territory, Australia, the first Government approved savanna fire management project area.

The workshop took place immediately preceding the World Indigenous Network (WIN) Conference in Darwin in May 2013 and allowed for a panel of Australian and international experts to participate in a dedicated session on the Australian and international experience of community based savanna fire management.

The Initiative has continued working with the WIN and Equator Initiative, an international grouping which promotes indigenous inputs into sustainability, with a major event that showcased traditional fire management at the World Parks Congress in November 2014, to be followed up with a further event with WIN and Equator Initiative at COP 21 in Paris.



Toolkit which consists of the outputs of the Initiative, a comprehensive library of material, network of experts and people working on savanna burning. It will eventually house the Initiative's Final Report, as well as detailed regional assessments for Asia, Latin America and Africa. It will also host an interactive map designed as a dynamic way of presenting the results of the Initiative and containing several layers, to present information at global, regional and local levels.

Further outputs and activities can be found at www.tfm.unu.edu.

Rekindling Brazilian indigenous people's ties with fire

The International Savanna Fire Management Initiative has already contributed to positive developments in other countries. Brazil's Institute of Environment and Natural Resources (IBAMA) Prevfogo, part of the Ministry of the Environment, was from 2013 mandated with the responsibility of managing fire in Terra Indigena (TI). Inspired by knowledge gained during a visit to Australia's Northern Territory by Brazilian fire experts in May 2014, Prevfogo has begun the process of compiling indigenous fire knowledge and fire use in two fire management pilot areas.

During their visit to Australia an eight-member Brazilian delegation including a member from Prevfogo among other state and federal institutions, learned first-hand how Aboriginal people in Australia's upper north are burning savanna lands, according to their intimate knowledge of the land based on generations of knowledge. The 11-day visit took the Brazilians to the Northern Territory's West Arnhem Land and the Kimberley in Western Australia. The Brazilians were impressed how the adoption of Aboriginal people's traditional knowledge in fire management provided Australia's own indigenous people with local employment and cultural empowerment.

In April this year, Brazil for the first time introduced early burning on indigenous lands in collaboration with the local peoples, while exploring the ancient fire management practices of the Xerente people, an indigenous community living in the country's interior. Here, Brazil is supported by the German government through GIZ, an international cooperation organisation for sustainable development, to jointly implement integrated fire management activities in the cerrado savanna plateaus in the country's centre. To further promote indigenous participation, IBAMA has worked closely with Brazil's National Indian Foundation FUNAI in the Xerentes territory.

4. INITIAL FINDINGS

While work on this Initiative is continuing, some initial findings include:

- a) the methodology for measuring the reduction of greenhouse gas emissions from early season savanna fire burning could be adapted to many other fire dependant landscapes around the world. The Initiative is finding that better fire management, through the application of the proven Australian approach, could lead to reductions of wildfire emissions by as much as a half;
- b) early season savanna burning has potential benefits to managing the increased risks of wildfires in the future;
- c) the Initiative, as a result of the workshops, is resulting in strong interest in the approach from countries across Southern Africa, Asia and Latin America. There is also potential interest from a range of philanthropic organisations and companies. In many of the countries in these regions, there is interest and readiness to further assess the feasibility of projects and on-the-ground practical work; and
- d) the approach has the potential to deliver a series of extra benefits Including;
 - creating market based jobs in remote and vulnerable communities,
 - promoting biodiversity,
 - supporting tourism through retention of biodiverse landscapes, reinvigorating culture, improving food security and health.



Traditional fire management can decrease land emissions and provide opportunities for indigenous peoples

5. NEXT STEPS

Traditional fire management represents a significant opportunity for decreasing emissions from the land sector and providing opportunities for indigenous peoples. The results of the workshops are feeding into conclusions of the Initiative, which are currently being finalised. These will include:

- a) The identification of potential pilot sites for actual projects. Criteria for identifying pilot sites may include;
 - wildfire mitigation and adaptation potential,
 - co-benefits (e.g. economic, social, health, cultural and biodiversity conservation benefits),
 - supportive enabling environment (e.g. community access and rights to savanna, supportive capable government and finance);
- b) feasibility studies of future projects;
- c) a toolkit to inform the implementation of future projects; and
- d) further promotion of the opportunities that early season savanna fire management provides.

Contact details for further information:

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ⁱ 2013 Global Assessment Report on Disaster Risk Reduction 2013.

ⁱⁱ Van Der Werf GR, Randerson JT, Giglio L et al. (2010) Global fire emissions and the contribution of deforestation, savanna, forest, agricultural, and peat fires (1997– 2009). *Atmospheric Chemistry and Physics*, 10, 11707–11735.

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Beringer et al "Fire in Australian savannas: from leaf to landscape" *Global Change Biology* (2015) 21, 62–81.

ⁱⁱⁱ Van Der Werf GR, Randerson JT, Giglio L et al. (2010) Global fire emissions and the contribution of deforestation, savanna, forest, agricultural, and peat fires (1997– 2009). *Atmospheric Chemistry and Physics*, 10, 11707–11735.

^{iv} see <http://www.nasa.gov/topics/earth/features/ifiery-past.html>



Reported losses generated by past wildfires average US\$2.4 billion per year

Better fire management could lead to wildfire emissions reductions by as much as a half



Namibia's Caprivi region - How early burning could improve lives

Savannas cover much of Namibia, including throughout the Caprivi/Zambezi strip in this African nation's eastern region. This area is scarred regularly by uncontrolled high-intensity, late dry season fires that destroy lives, property and community livelihoods.

Few know more about this perennial problem which exacerbates poverty than members of local environmental NGO Integrated Rural Development and Nature Conservation (IRDNC). IRDNC representatives visited Northern Australia in May 2013 and hosted Northern Australian fire experts in Namibia in December 2014 to exchange traditional fire management knowledge.

Noting similarities between savannas of the two countries, IRDNC co-founder Garth Owen-Smith said "in terms of fire we are quite a long way behind Australia." "We need to bring it back to what the early people knew, burn early and keep the scrub down," he added.

Controlled burns in the Caprivi, as in Australia, create a more productive landscape while reducing emissions. The community-based work of organisations such as IRDNC could lead to abatement opportunities based on early burning.

Fellow IRDNC co-founder Margaret Jacobsohn noted the challenges of tapping the carbon market, including consistently low global prices. The Australian experience, however, demonstrates, "there are ways through these issues," she said. "If it were possible to gain carbon credits, it would create sustainability and many other spins offs for the communities."