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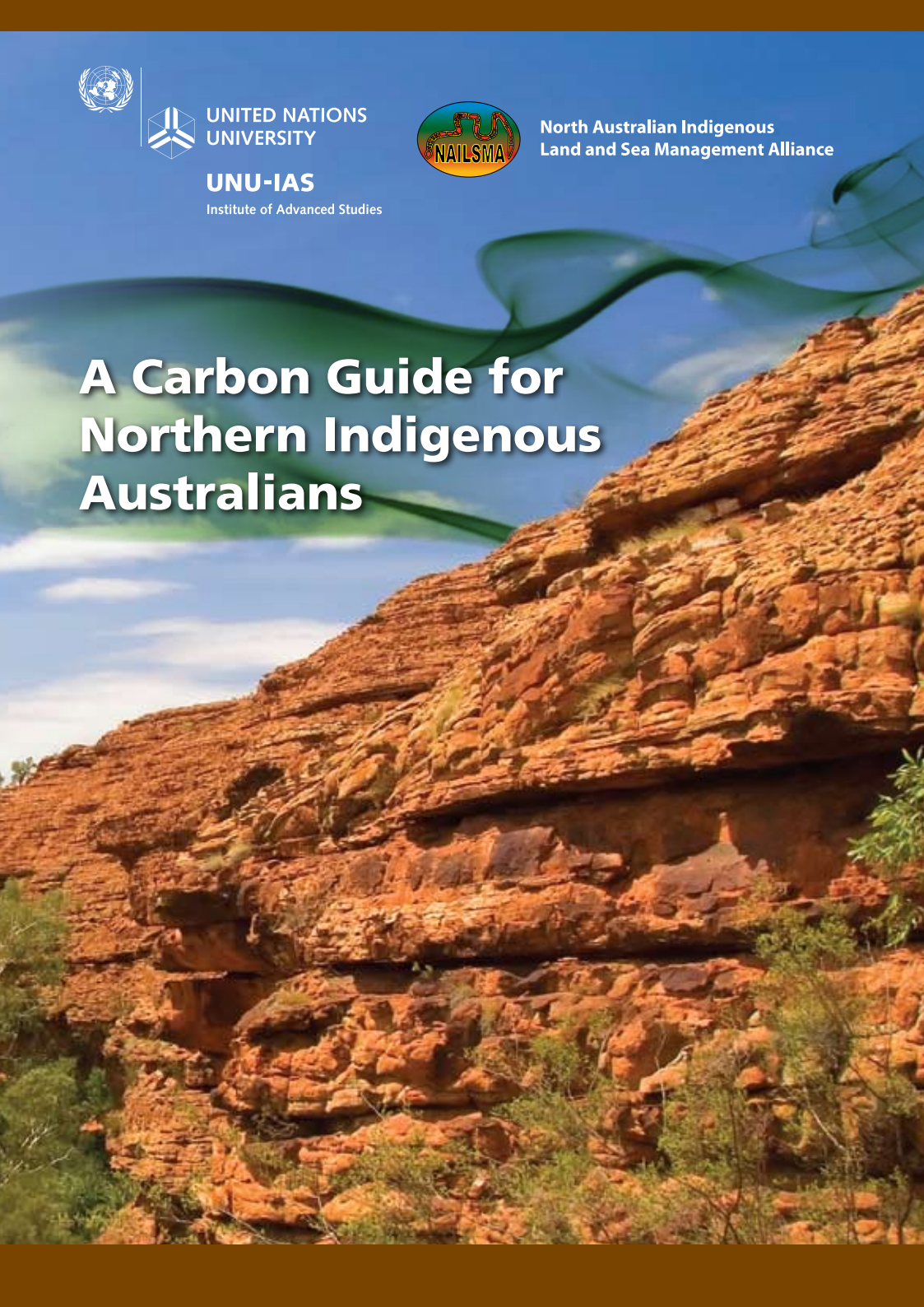
UNU-IAS

Institute of Advanced Studies



North Australian Indigenous
Land and Sea Management Alliance

A Carbon Guide for Northern Indigenous Australians



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The views expressed in this guide are the author's own.**

**With sincere thanks to the following people for their comments
and assistance:**

Andrew Eil, Benoit Bosquet, Megan Brayne, Peter Cooke, Andre Grant,
Peter Kuria, Sam Johnston, Joe Morrison, Samantha Muller, Belinda Oliver,
Jeremy Russell-Smith, Michael Tuckwell, Peter Whitehead, Martijn Wilde
and Cameron Yates. Publication of this Guide was generously supported
by The Christensen Fund and The David and Lucile Packard Foundation.

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UNU-IAS Guide

A Carbon Guide for Northern Indigenous Australians

January 2009



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About this Guide

As efforts to reduce greenhouse gas emissions increase, so do the sources of *'carbon financing'* and the size of the international *'carbon market'*. Greenhouse gas abatement activities can have both beneficial and detrimental impacts on the communities in which they operate. For this reason, it is vital that Indigenous communities have accurate information about carbon financing and carbon market processes at the outset – to help them make informed decisions and choices about activities that work for them.

This is a short guide for Northern Indigenous Australians on the impacts of and responses to climate change, particularly market and financial mechanisms for reducing greenhouse gas emissions (often referred to as the *'carbon market'*, *'emissions trading'* and/or *'carbon financing'*). The guide is intended as a first edition: comments, case studies and more information would be most welcome – please contact ingrid@iisd.org, johnston@ias.unu.edu or jessica.lewfatt@cdu.edu.au.

Section 1 explains what climate change is and outlines the international response to this problem. **Section 2** describes the carbon market and the different activities that may generate *'emissions reduction credits'* or *'offsets'*. It lists some points to think about when undertaking emissions reduction or offsetting activities. It also outlines the current situation with regard to the carbon market in Australia and opportunities for accessing carbon financing, before discussing the possible impacts of emissions reduction activities on Indigenous people. **Section 3** looks at the role of Australian Indigenous fire management practices in greenhouse gas abatement. **Section 4** provides short case studies of Indigenous engagement with greenhouse gas emissions reduction activities, both within Australia and beyond.

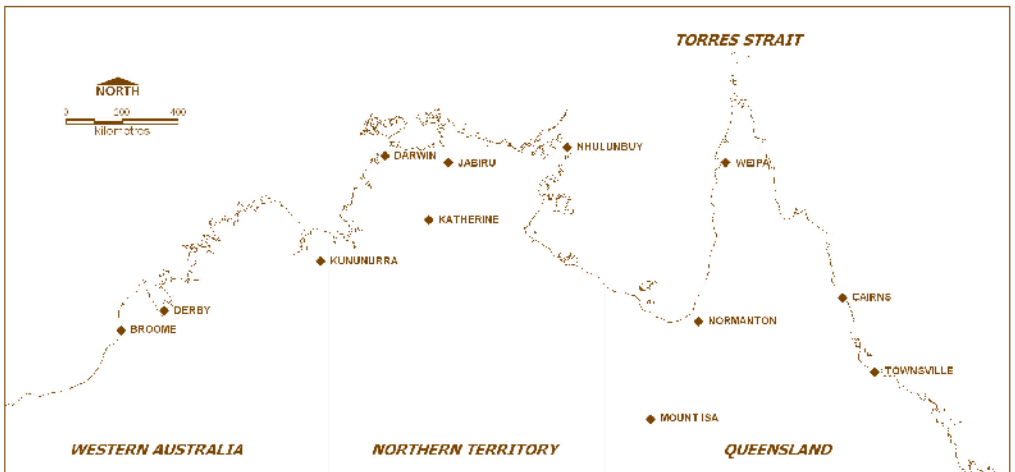
In light of the current international framework for addressing climate change, and so long as there is no nation-wide emissions trading scheme nor a local scheme in the Northern Territory, Queensland

or Western Australia, the most likely ways for Northern Indigenous Australians to engage in the carbon market in the very near term may be:

- through private agreements for the sale of emissions reductions or offsets in the 'unregulated' or voluntary carbon market, or
- through broader carbon financing, natural resource and land management or sustainable community development activities.

This situation may change, however, when a nation-wide emissions trading scheme is introduced. Depending upon the design of that scheme, there may be even greater opportunities for Indigenous communities to engage in carbon offsetting activities in the future.

This is not a comprehensive legal guide to engaging in carbon market activities. The particular features of any single transaction will vary depending upon technical and local factors not discussed here. The Reference List, included at the end of this guide, lists many sources of useful information. The list is divided by subject area and includes only references that are available free of charge on the internet. Additionally, a glossary and list of abbreviations is included.



1. Climate Change and the International Response

1.1 What is 'Climate Change'?

Part of the earth's atmosphere is made up of **'greenhouse gases'**. These gases absorb infrared radiation from the sun, reflect some of it back into space and emit some of it towards the earth. This natural process of trapping some of the sun's energy in the atmosphere, called the **'greenhouse effect'**, provides for relatively stable and mild temperatures on earth and in the atmosphere. However, human activity can change the concentration of greenhouse gases in the atmosphere, which can amplify the greenhouse effect.

There are a range of greenhouse gases, including water vapour and ozone, however, the six main gases are carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons and sulphur hexafluoride. Many human activities involve the emission of greenhouse gases. These **'human-induced'** or **'anthropogenic'** emissions have increased significantly since the start of the western industrial era from the mid 1800s, particularly emissions of carbon dioxide. In most countries, rates of emissions are still increasing now. This is mostly because of the combustion of **'fossil fuels'**, which includes gas, coal, oil and oil-derived products such as diesel. Fossil fuels are combusted to create electricity, to provide heating, to power all forms of transportation and to power industrial processes, like mining and manufacturing activities. In each case, greenhouse gases – particularly carbon dioxide – are released into the atmosphere.

Other key activities that involve greenhouse gas emissions are waste management, agriculture, and land clearing and deforestation. As plants, trees and microscopic fauna in the soil grow, they absorb carbon dioxide from the atmosphere and store the carbon. This process is known as **'carbon sequestration'** (or more precisely,

'carbon biosequestration') and the forests and bush that sequester carbon dioxide are called '**carbon sinks**'.¹ The decline of forests and bush ('**forest degradation**'), and the clearing of vegetated land or the removal of forests or wilderness ('**deforestation**') therefore affects the earth's natural ability to reduce the amount of carbon dioxide emitted into the atmosphere. Also, when land is cleared, the carbon dioxide the trees stored while they were living is slowly released back into the atmosphere and the land-clearing process itself may involve emissions, particularly when burning is used.

Figure 1: Global Greenhouse Gas Emissions in 2004 by Activity
(please see colour section on page 27 for Figure 1)

As the human-induced emission of greenhouse gases has increased, so has the concentration of these gases in the atmosphere, which is raising the earth's temperature ('**global warming**'). This is affecting other aspects of the earth's climate system – hence the term '**climate change**'. This includes rainfall patterns and ocean levels, the direction and speed of wind and ocean currents, seasonal cycles, and the likelihood and intensity of climatic disasters such as droughts, storms and floods (IPCC, 2007). These climatic changes can prompt other environmental, social and economic problems, such as:

- soil erosion and land degradation;
- the flooding or loss of low-lying lands into the ocean;
- changes to the fertility of agricultural lands;
- changes to the zones where infectious diseases occur;
- a reduction in the earth's diversity of animal and plant species; and
- a reduction of fresh water supplies (IPCC, 2007).

Figure 2: The Greenhouse Effect
(please see colour section on page 27 for Figure 2)

¹ Oceans are another major carbon sink.

1.2 Impacts of Climate Change on Indigenous Peoples

It is now internationally recognised (though sometimes ignored) that climate change is having a disproportionate effect on vulnerable communities, including Indigenous peoples (IPCC, 2007). Impacts include:

- negative effects on the natural resource base of traditional Indigenous livelihoods; this includes the natural resources and ecosystems important for tourism, hunting, gathering, fishing and herding;
- the melting of glaciers and polar ice – much of this in areas of significance to some Indigenous peoples;
- increased vulnerability to external influences, such as drought, flood, wildfire and invasive plants and animals;
- shortages of food, fuel or water, which may in turn prompt migration away from traditional lands; and
- threats to traditional knowledge and cultural activities that involve Indigenous peoples' relationships with land, plants and animals.

In Australia, identified climate change impacts that may particularly affect Indigenous people include:

- the destruction of coral reefs;
- the extinction or reduction in number of plant and animal species, including bush tucker and medicinal plants;
- changes to the flammability of ecosystems;
- damage to coastal areas and inland flood plains; and
- increased vulnerability to storms, floods, droughts or invasive plants and animals (pests), which in turn affects ecosystems.

Such impacts can affect livelihoods important to some Indigenous communities, such as tourism or fishing activities. They may also affect

the rate and intensity of uncontrolled bushfires and might even affect the spiritual and cultural connection of Indigenous people with country (Oxfam, 2007). For more information on the impacts of climate change on Indigenous peoples, see the Reference List at the end of this guide.

1.3 International Response to Climate Change

Over the past 18 or so years, the international community has sought to respond to climate change by reducing the amount of greenhouse gases released into the atmosphere from human-related activities. This effort to reduce our emissions is called **'mitigating'** climate change. Much of this effort has been focused on reducing our use of fossil fuels and changing the way we use land – such as by reducing our rate of land clearing and deforestation, and increasing our rate of reforestation and **'aforestation'** (planting forests on previously unforested land). More recently, countries have also started to address the effects that climate change is already having on land, ecosystems and livelihoods. This is called **'adapting'** to climate change.

An international agreement, called the United Nations Framework Convention on Climate Change (**'UNFCCC'**) was agreed in 1992 and entered into force in 1993. This agreement provides a framework for international cooperation on climate change. In particular, it provides that countries should collect information and produce reports on their national greenhouse gas emissions and also report on their efforts to reduce emissions. It further provides for international cooperation in climate change research and for wealthy, developed (**'Annex I'**) countries to provide technological know-how and financial resources to poorer, developing (**'non-Annex I'**) countries to help them respond to climate change.

The **'Kyoto Protocol'** – a subsidiary agreement under the UNFCCC – was concluded in December 1997 but did not enter into force until February 2005. Australia was involved in negotiations throughout but only became a member or **'party'** to this Protocol in December

2007. This means that the provisions of the Protocol are now binding on Australia under international law. All developed countries are now parties to the Protocol except the United States. The vast majority of the world's developing countries are also members, bringing the total number of parties to 181.

The Kyoto Protocol is very important as a mechanism to foster international collaboration to tackle climate change. More specifically, it establishes legally binding '**emissions targets**' for developed countries (Annex I parties) and each country's target is different.² A target is based on a country's recorded level of emissions during a chosen '**baseline**' year (mostly 1990). Australia, for example, has a target of 108% of its emissions from the year 1990. Under the Protocol, Australia must achieve this target, which applies collectively to the six main greenhouse gases, between the years 2008 and 2012.³ These targets are difficult for many countries such as Australia to meet because in most cases, greenhouse gas emissions have continued to increase since 1990 with economic development.

These Kyoto Protocol obligations on developed countries, together with various domestic laws and policies to reduce greenhouse gas emissions, have prompted many governments and other actors to develop activities and financial resources to reduce greenhouse gas emissions, often in countries other than their own. As a result, a new 'carbon market' for greenhouse gas emissions trading has emerged, together with various opportunities to access financing for emissions reduction or offset projects. The next section of the guide describes the carbon market and opportunities for carbon financing.

² The countries of the European Union will meet their target collectively.

³ As of 2008, countries are beginning to negotiate about what commitments should be accepted for the period after 2012.

2. The Carbon Market and Carbon Financing

2.1 Building Blocks of the Carbon (or Emissions Trading) Market

What is Emissions Trading?

'Carbon trading', or '**emissions trading**', takes place when there is sale and purchase of:

- '**permits**' or '**allowances**' to emit greenhouse gases; or
- '**certificates**' that prove a certain reduction in emissions from a particular activity beyond what would otherwise have been the case (i.e. 'business as usual' emissions); or
- certificates that indicate a certain amount of actual emissions have been '**offset**' somewhere else, through for example, carbon sequestration.

Usually, each permit, allowance or certificate is a document, often electronic, representing one tonne (1,000 kg)⁴ of carbon dioxide equivalent ('**CO₂e**') that was emitted, or not emitted below business-as-usual projections for emissions. Not all greenhouse gases warm the atmosphere equally – some gases (such as methane) have a larger effect than carbon dioxide. To account for this, the term CO₂e is used, which means that greenhouse gases other than carbon dioxide are converted to the equivalent amount of carbon dioxide, based on their relative contribution to global warming. This provides for a single, uniform means of measuring emissions reductions for multiple greenhouse gases.

What is the Carbon Market?

Transactions for the sale of emissions permits, reductions or offsets together comprise the 'carbon market', which has grown exponentially

⁴ The American 'ton' is equal to 907.18kg.

since the entry into force of the Kyoto Protocol in 2002. In fact the term ‘carbon market’ is not entirely accurate: because carbon dioxide is only one of several greenhouse gases that can be ‘traded’; and because there is not yet a single, unified international market for emissions reduction purchases. Rather, there are various markets in operation around the world, which can be classified as either regulatory (compliance) or voluntary markets and which interact with one another in different ways.

‘Regulatory’ or ‘compliance markets’ are emissions trading schemes set up under domestic or international law to provide a means for specified actors (often large industrial or power companies) to meet emissions reduction targets. Key examples include the European Union Emissions Trading Scheme and the New South Wales and Australian Capital Territory Greenhouse Gas Abatement Schemes.

The features of each of these schemes are different. In most (but not all) cases, the government places a ‘cap’ on the amount of greenhouse gases that certain factories or companies can emit over a period of several years. Entities covered by the scheme are usually from high greenhouse gas emitting sectors of the economy. If a company is going to emit more emissions than its cap, it can buy surplus credits or allowances from another company that has managed to beat its cap (by reducing its emissions below its cap). Alternatively, some schemes provide that the company can pay to offset its excess emissions through emissions reducing activities undertaken by others. The government entity administering the scheme will decide which activities can qualify as potential offsetting activities.

‘Voluntary markets’ arise where there are private agreements to trade or offset emissions or emissions reductions among actors who may not be legally bound to meet an emissions reduction target, but who have decided to take action anyway. Sometimes these are one-

off, single agreements and sometimes they are part of wider voluntary schemes, each with its own procedures and requirements.⁵

What is the Size of the Market?

In light of the fragmented nature of the market, it is difficult to describe precisely its current and projected size. Research indicates that the entire global market was worth more than US\$30 billion in 2006, three times its value in the previous year (Capoor and Ambrosi, 2007), to then over US\$60 billion in 2007 (Reuters, 2008). Much of this value, however, concerns parts of the market that did not involve Australian actors.

Within Australia, the regulated New South Wales market (discussed below) saw record trades in 2006, though prices for credits dropped in late 2007 after the Howard government announced that it would introduce a nation-wide trading scheme by 2010 (see below). Again, this market does not really involve Northern Indigenous Australians at this time. There is no regulated market in WA, Queensland or the NT, nor at the federal level, so activities in these regions are usually part of the private, voluntary market.

2.2 Generating Tradeable Credits

Types of Activities that Generate Tradeable Credits

Key greenhouse gas mitigation activities that can generate credits or offsets for sale include energy efficiency, renewable energy and land use and forestry activities. Other kinds of activities that may also generate credits but which are not addressed here include the management of methane released from landfill or waste sites or by livestock, and substitution of fossil fuels for use in transportation and industrial processes. The first three are described in more detail below.

⁵ WWF recently published a guide that explains the voluntary carbon market and compares some of the big voluntary schemes in existence: http://assets.panda.org/downloads/vcm_report_final.pdf

Energy Efficiency Projects

‘Energy efficiency’ involves reducing the amount of energy used to operate a product or to carry out a process, without reducing the quality or level of service.⁶ You might choose, for example, a car that needs less fuel to travel the same distance at the same speed as another that uses more fuel. Related to that, energy conservation may involve reducing the demand or need for energy.

Energy efficiency activities can be undertaken in the industry, agriculture, electricity generation, transportation or households among others – really in any activity where an opportunity exists to use energy in a more efficient way. One example of an energy efficiency project that could attract carbon financing would be the replacement of old, inefficient light bulbs throughout a community with new light bulbs that use less electricity to give the same amount of light. Another would be to replace a very old refrigerator or freezer that uses a lot of electricity with a modern one that uses less. The great added benefit of energy efficiency projects is that they can save communities money in the long run, by reducing the size of the community’s energy bill.

Renewable Energy Projects

‘Renewable’ energy can be used to provide electricity, heating or fuel for transportation similar to the way we use fossil fuels for these purposes. Such sources are called ‘renewable’ because, unlike oil, gas and coal, there is not a finite amount of them in the earth. Key renewable sources include wood, waste decomposition, geothermal activity, wind and solar energy. The use of renewable sources for generating energy usually involves lower emissions of greenhouse gases than the use of fossil fuels does. An example of a renewable energy project would be to switch from using a diesel generator for providing electricity, to using solar panels to provide electricity.

⁶ It may also involve finding a way to make the actual generation of electricity more efficient, but that is not addressed here.

Renewable energy may not only reduce a community's energy bill, but also provide the community with an important source of electricity when access to the electricity grid is not possible.

Land Use and Forestry Projects

As plants and trees act as carbon sinks, various 'land use and forestry' activities can lead to a reduction in atmospheric greenhouse gas emissions. In particular, reducing the rate of, or avoiding entirely, landclearing or deforestation is one such way because these activities release carbon dioxide into the atmosphere. Another is by planting new trees to absorb more carbon dioxide. Other land management practices may also be undertaken – such as carrying out controlled burning in the early part of the dry season to prevent more frequent and intense bushfires later in the dry season. The latter may provide particular opportunities in Northern Australia, where controlled burning may not only help to reduce emissions, but may also help to control pests and weeds, maintain traditional Indigenous land management practices and provide for employment and training opportunities.

What is Involved in Generating Tradeable Credits?

Who may buy and sell credits or offsets, and the particular procedures involved in generating credits for sale, vary considerably from one regulatory scheme to the next and from one transaction to the next within the voluntary market.

Often the purchase of credits or offsets will take place by way of a legal agreement or contract between two or more '**parties**'. The terms of the agreement may be decided upon by the parties, however, a regulatory scheme under which a sale takes place may also require that certain terms be included in the agreement. Here are some requirements that are common in the purchase or financing of emissions reductions.⁷

⁷ The agreement or scheme under which the transaction takes place is also likely to include a range of legal provisions that are not described here. This does not serve as legal advice.

- 1) Additionality:** Often, tradeable emissions reductions must occur in addition to any reductions that would have occurred in a business-as-usual situation – i.e. they must be emissions reductions that would not have occurred without the funded activity or project. This requirement is called **'additionality'**. For example, if a community has already replaced diesel generators with solar panels for providing hot water that uses less greenhouse gases, it may not be able to sell credits or offsets from the solar panels because any reduction in the amount of emissions was likely to occur anyway. This criterion is not always applied, however.
- 2) Measurable Emissions Reductions:** In light of the above, and in order to determine the precise nature and cost of a transaction, the emissions reductions or offsets must not only be additional, but they must be capable of being measured so that the exact amount can be ascertained (see 1 and 2 on the next page for more on this).
- 3) Anthropogenic Emissions:** The emissions or emissions reductions must generally be related in some way to human activity (called **'anthropogenic'**), rather than simply being naturally occurring emissions or emissions reductions.
- 4) Age of the Forest or Plantation:** In the case of carbon sequestration activities (where greenhouse gas emissions are offset by an amount of carbon dioxide stored in a designated forest or area of bush), the forest must often have been planted after 31 December 1989 or some other year date as designated in the agreement or rules of the trading scheme.
- 5) Expiration of Forest Credits:** There is sometimes a concern about the 'non-permanent' nature of credits from forest-related activities – in particular, a concern that carbon dioxide offset or stored through forestry activities may not be permanent if the trees in the forest die, are burnt down or are cleared. Because of this concern, forestry-related credits may sometimes be time bound, which

means that they exist for only five, 20 or 30 years, after which time they expire. In this case, the agreement may provide that the expired credits must be renewed or replaced at the end of the time period.

6) Sustainable Development: The proposed activity should contribute to the '**sustainable development**' of the community within which it operates. This means that it should form a part of the wider economic, social and environmental development of the community and avoid other detrimental consequences.

Planning for a Project

Before signing an agreement, the project developer or seller of the credits will usually document a clear plan that sets out: 1) what the project will involve; 2) how the emissions reductions or offsets will be measured and certified; 3) the relevant actors and stakeholders; 4) how all stakeholders have been consulted; and 5) what are likely to be the environmental and other impacts and risks of the project.

Here are some issues to think about when developing a project plan.

1) Measuring Emissions Reductions: For the purposes of measuring the precise amount of emissions reductions that result from any funded project (and so as to ensure that there is additionality), it is important to know the quantity of greenhouse gases already being emitted from a targeted activity, and to be able to continue measuring emissions from that activity during and after the project is implemented.

2) Methodology for Measuring Emissions Reductions: There are a range of existing 'methodologies' in Australia (and elsewhere) for measuring the emissions that result from various daily and commercial activities. See the various methodologies developed for measuring emissions in Australia, for example, at <http://www.greenhouse.gov.au/inventory/methodology/index.html>. There are also organisations, government and scientific, that may be able

to help communities to measure the emissions resulting from any single activity, so communities may not have to face this issue alone. Often, assistance from a partner organisation with measuring emissions will itself be a part of the funded emissions reducing project. So while this is a technical point, it does not have to be an insurmountable barrier to involvement in emissions reduction projects.

- 3) Wider Impact of Project:** In planning for an emissions reducing activity, it is important to consider what wider impacts the project may have on the community and its environment, both good and bad, and to try to ascertain if the project will help the sustainable development of the community.
- 4) Consultation:** It is important that all relevant stakeholders and community representatives are consulted during the planning of a project. Often, the buyer and/or any third party financier of an emissions reducing project will seek an assurance that the local community has been consulted and is supportive of the project. Similarly, the local community and/or seller might wish to ensure that the potential buyer is acceptable to them.
- 5) Right to Emissions Reductions:** When a proposed activity, particularly forestry or land activities, is to take place on land that is not owned by the project developer, it may be necessary to clarify beforehand who would own the legal property rights to any emissions reduction credits or offsets generated. The same applies if the project developer owns the trees on the land, but not the land itself.
- 6) Verification/certification of Emissions Reductions:** An authorised third party may need to **'verify'** and **'certify'** the emissions reductions or offsets. Often times the scheme or agreement under which the activity is taking place will designate who is entitled to carry out these procedures.

In the case of transactions under regulatory schemes, these and many other issues will be decided upon by the rules of the scheme itself. For more information on the precise legal and regulatory issues associated with projects under the Kyoto Protocol's Clean Development Mechanism (discussed below), see the Reference list at the end of this guide.

2.3 Examples of Key Regulatory Markets

The Kyoto Protocol allows for several 'market-based mechanisms' to assist developed countries to meet their emissions reduction targets. '**Joint Implementation**' allows a developed country to fund and/or run a project to reduce emissions in another developed country. The funding country can then apply the emissions reductions generated to its own Kyoto target. As a developed country member of the Kyoto Protocol since December 2007, Australia will now be able to participate in activities under this mechanism, however, the federal government will first have to implement relevant domestic legislation.

Through the '**Clean Development Mechanism**' (or '**CDM**'), developed countries may finance emissions reducing projects in developing countries that are party to the Kyoto Protocol and then use the resulting 'certified emissions reductions' ('**CERs**') to offset their own emissions. Though very important internationally, this scheme is not relevant to Indigenous Australian communities, because Australia, as a developed country, cannot host a project under this mechanism within Australia.

The Kyoto Protocol is also flexible in that developed countries may decide how to reduce their emissions at a domestic level.⁸ In this context, a range of emissions trading schemes and other market-based mechanisms have emerged. Examples include the European Union

⁸ Another flexible mechanism not discussed here is the fact that members of the Kyoto Protocol with emissions reduction targets may trade among themselves in seeking to meet their targets.

Emissions Trading Scheme (incorporating Norway), the Swiss Emissions Trading Scheme, the New Zealand Emissions Trading Scheme and another scheme running in several North Eastern states of the United States. The US federal government, the US state of California, Japan, Australia and Canada, among others, are in the process of (separately) considering the establishment of such schemes. Planned and existing markets at the Australian federal and state level are discussed further below.

2.4 The Australian Policy Context

There is currently no nation-wide regulatory emissions trading scheme in Australia, though the federal government is planning to implement one by 2010. Additionally, schemes already exist in New South Wales and the Australian Capital Territory, but only emissions reductions generated within these areas are relevant.

NSW and ACT Greenhouse Gas Abatement Scheme

The NSW Greenhouse Gas Reduction Scheme was established by the NSW government in 2003. Under the scheme there is an annual, statewide greenhouse gas reduction target for the electricity sector (expressed in CO₂e per capita). Electricity retailers and certain others who buy or sell electricity in NSW (known as 'benchmark participants') are then given individual emissions reduction benchmarks, based on their share of the electricity market.

To meet these benchmarks, participants can reduce the average emissions intensity of the electricity they supply or they can purchase credits, called New South Wales Greenhouse Abatement Certificates (NGACs). Each NGAC represents one tonne of avoided carbon dioxide emission. They can be generated by: reducing the greenhouse gas intensity of electricity generation; developing low emission intensity electricity; reducing, or increasing the efficiency of, electricity consumption; or carbon sequestration activities.

The certificates generated since 2003 are estimated to be worth about \$450 million (Frew and Wilkinson, 2007) and the scheme is the second largest single regulated market in the world (Capoor and Ambrosi, 2007). It will continue until 2021 or until the commencement of a national scheme.

The ACT government introduced a scheme that mirrors the NSW scheme in January 2005. The two schemes use the same abatement certificates and participants can use certificates generated in either place to meet their obligations under either scheme. To generate a certificate, the activities must occur within the ACT or NSW, however, so these activities are not currently of great interest to Northern Indigenous Australian communities.

For more information, see:

- <http://www.greenhousegas.nsw.gov.au/>
- <http://www.icrc.act.gov.au/actgreenhousegasabatementscheme>

The Development of a Nation-wide Scheme

In 2007, the Howard federal government announced that it intended to establish a nation-wide regulatory emissions trading scheme by 2010. In December 2007, the Rudd federal government confirmed that it hoped to finalise the details of the so-called 'Carbon Pollution Reduction Scheme' by the end of 2008 and to have it operational by 2010. In July 2008, the government released a 'Green Paper', which sets out approaches and preferred options for the scheme, including which sectors of the economy should be covered (see <http://www.climatechange.gov.au/greenpaper/index.html>). A series of public information and consultation sessions were subsequently held, before a 'White Paper', setting out the intended design of the scheme, was released and it is anticipated that draft legislation will be released for consultation in December 2008 (see <http://www.climatechange.gov.au/whitepaper/foreword.html>) (see <http://www.climatechange.gov.au/>)

greenpaper/index.html). Draft legislation is expected to be released in February 2009 and the government intends to commence the scheme on 1 July 2010.

The Rudd federal government has said that this scheme will consist of an overall '**cap**' or limit on the total greenhouse gas emissions of all companies covered by the scheme. Permits will then be allocated to these companies up to the amount of their individual targets (with each permit representing one tonne of avoided CO₂e). Trading will allow those covered by the scheme to buy and sell surplus permits. Those covered will also be able to buy offsets generated by emissions reduction projects in sectors not covered by the scheme, such as the forestry sector. The scheme will extend to all six main greenhouse gases and should cover around 75% of national emissions, according to the Rudd government.

Once operational, it is likely that this scheme will significantly increase possibilities for emissions trading within Australia. The scheme will probably cover certain companies in the energy, transport, waste and industrial sectors but precisely which actors, greenhouse gases and activities will be covered, remains unclear. The agricultural sector will not be covered initially. On forestry, deforestation will not be included in the scheme, however, the government's Green Paper proposes that all reforestation activities (on land reforested from 1990 onwards) be included in the scheme from 2010 on a voluntary basis. It is intended that "landholders, certain lease holders and certain carbon property rights holders" be able to apply as forest entities under the Scheme. A Discussion Paper that specifically addresses reforestation suggests the scheme could either be: 1) open to legal entities possessing at least a right of access to the relevant land and the legal capacity to establish a forest on it; or 2) only to landowners and the holders of long-term leases. In a separate Discussion Paper that specifically addresses reforestation, both cases, the Discussion Paper suggests, the written consent of all interested parties may need to be obtained.

The Discussion Paper also queries how Option 2 in particular might interact with any Indigenous or Native Title interests over the relevant land (see <http://www.climatechange.gov.au/emissionstrading/publications/pubs/forestry-paper.pdf>).

Additionally, the government has said that it “will further investigate the opportunity to reduce emissions from savanna burning in Northern Australia and the potential for carbon offsets from this activity” and that it “will facilitate the participation of Indigenous land managers in carbon markets and will consult with Indigenous Australians on forestry and other opportunities under the Scheme”. At the same time, the government has suggested that, in general, opportunities for pursuing offsets under the scheme may be limited (see <http://www.climatechange.gov.au/whitepaper/summary/index.html>) and it has not yet provided further information of what is meant by facilitating Indigenous participation.

It is possible that the scheme will be linked to the market-based mechanisms under the Kyoto Protocol and to the New Zealand Emissions Trading Scheme currently under development – thereby further increasing emissions trading opportunities in Australia. However, precisely how and whether this will take place is not yet known.

As such, in light of the current international framework for climate change, and so long as there is no nation-wide emissions trading scheme nor a local scheme in the NT, Queensland or Western Australia, perhaps the most likely ways for Northern Indigenous Australians to engage in the carbon market in the very near term are:

- through private agreements for the sale of emissions reductions or offsets in the ‘unregulated’ or voluntary carbon market, or
- through broader carbon financing or sustainable community development activities.

The notion of 'carbon financing' is discussed further below.

2.5 Carbon Financing Opportunities

Another key aspect of the overall development of efforts to reduce greenhouse gas emissions has been the emergence of a range of opportunities for indirect or third-party financing of emissions reduction activities, which may or may not be connected to the emissions trading. This is sometimes referred to as 'carbon financing'. In fact, it may also include other fiscal incentives, such as tax rebates or exemptions for the installation of emissions reducing equipment, such as solar water panels.

International organisations like the World Bank, the Asian Development Bank, the United Nations Development Programme and private investment firms and banks have established a range of funds to facilitate emissions reducing activities. However, these programmes often focus on developing countries, such that little of this international finance is currently available to Indigenous Australians.

Financing opportunities may well exist in Australia within the context of wider community and sustainable development activities. The reduction of emissions might be just one aspect of a project designed to ensure sustainable land management, ecosystem protection, improved community health, the creation of employment or training opportunities, sustainable livestock management, or the development of a more stable community power supply, for example. When carrying out wider projects like these, it might be worth considering whether they could include an emissions reducing component and whether that might assist with the attraction of finance. Examples of these kinds of activities include the first two case studies discussed in section 4. Other examples include:

- the Renewable Remote Power Generation Program (RRPGP) of the federal government <http://www.greenhouse.gov.au/renewable/rppg/index.html>;

- the incorporation of environmental outcomes into Shared Responsibility Agreements; and
- the Indigenous Protected Areas Programme, which may include an emissions reduction aspect to activities in a Protected Area <http://www.environment.gov.au/indigenous/ipa/index.html>

A range of relevant programmes also exist at the state and territory level.

2.6 Impacts of Carbon Mitigation Activities on Indigenous People

Reports are mixed as to whether climate change mitigation activities are having a positive impact on the lives and lands of Indigenous peoples. Research suggests that problems can arise when Indigenous people are not properly consulted and their ecological knowledge not utilised, nor their interests taken into account, in the development of carbon mitigation activities.⁹ There have been claims of some Indigenous people being evicted from lands to allow for the planting of trees or biofuel crops, or for the development of hydropower schemes, for example. Other commentators note that the growing demand for biofuel crops (for transportation fuel) may reduce the production of food crops and raise food prices (Nakashima, 2007). There have not been any such reports in relation to Australia to date.

If instituted appropriately, climate change mitigation activities can facilitate the availability and reliability of energy, sound water resource management, a reduction in air pollution and the conservation of ecosystems, plants, animals and land of importance to Indigenous people. Climate change mitigation activities may encourage a return to country, provide local employment or even encourage the maintenance of traditional practices, such as customary land management activities.

⁹ See Griffiths, 2007; Karama Insley and Meade, 2007; Lang and Byakola, 2006; Salick and Byg, 2007; Tauli-Corpuz and Tamang, 2007; World Business Council for Sustainable Development, 2007; UNPFIIIS, 2007, among others.

Additionally, it is important to bear in mind that Indigenous people themselves can contribute a great deal to mitigating and adapting to climate change, given their experiences of responding to natural climatic change over millennia and given their ownership of considerable tracts of forested and wild land (Nakashima, 2007; see also Oxfam 2007). More information on the effects of the carbon market on Indigenous people can be found in the resources contained in the Reference List.

Figure 1: Global Greenhouse Gas Emissions in 2004 by Activity

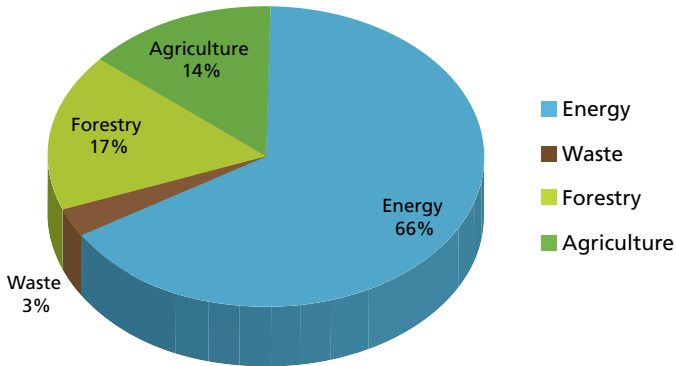


Figure 2: The Greenhouse Effect

Schematic representation of the 'greenhouse effect'. While this is a naturally occurring phenomenon, human-induced increases in the atmospheric concentration of greenhouse gases are causing global warming and climate change.

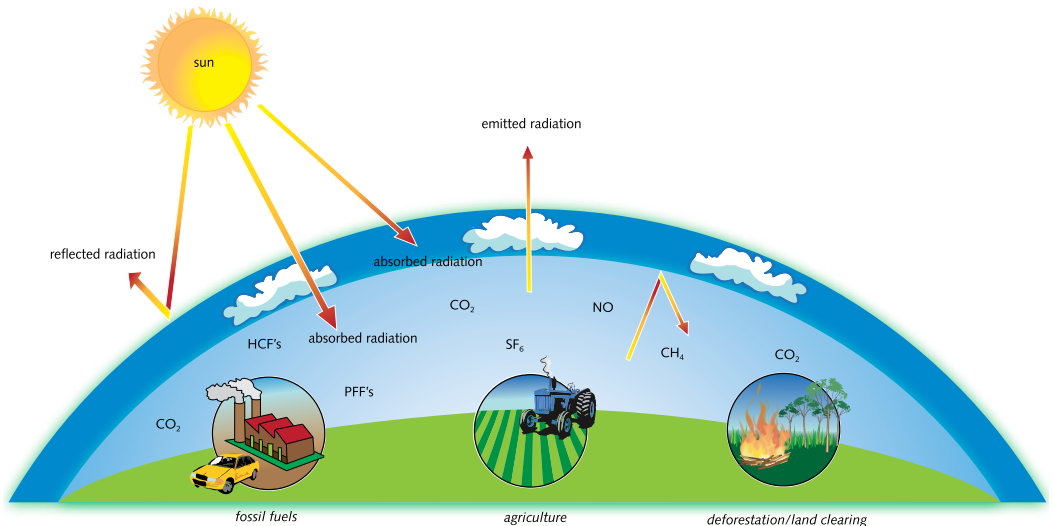
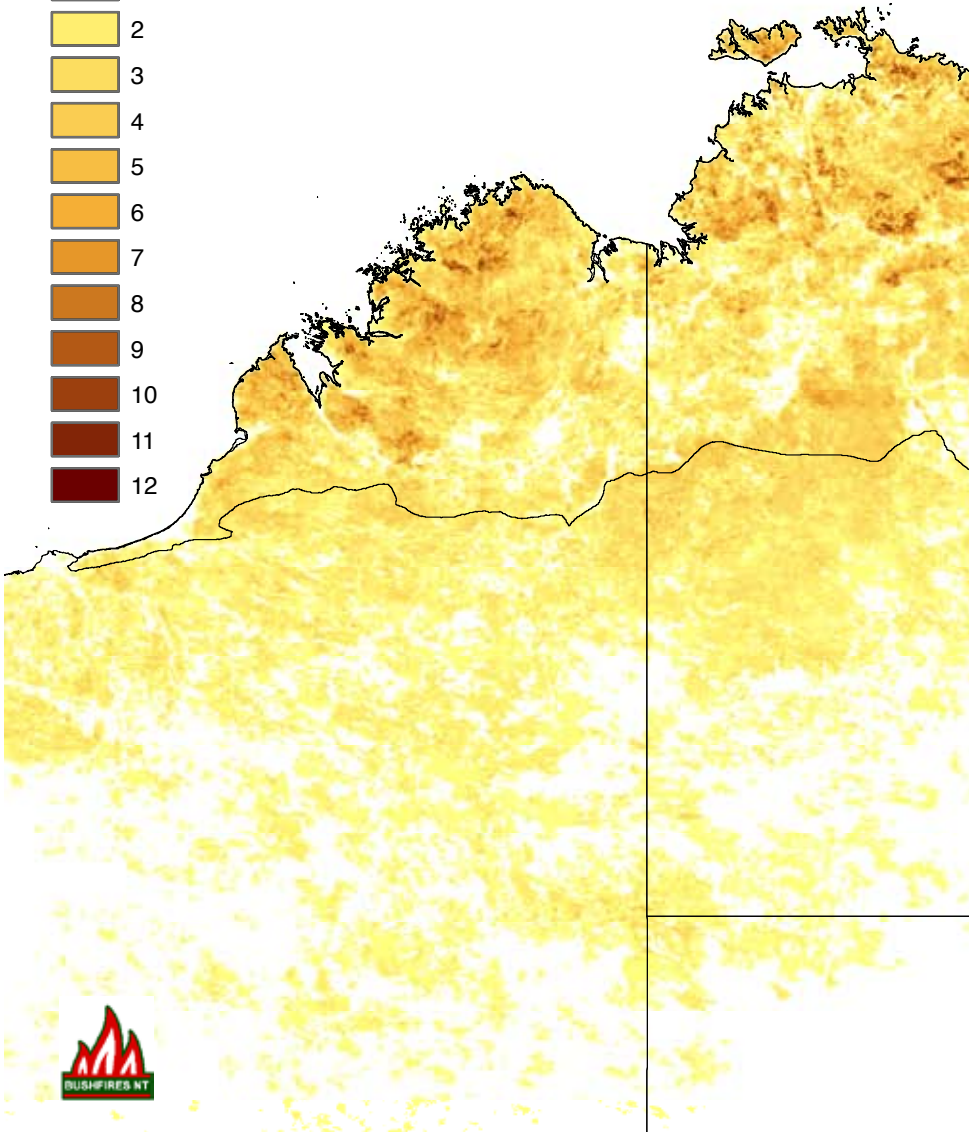
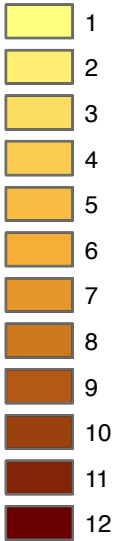


Figure 3: Fire Frequency in the Australian Tropical Savannas 1997–2007

Times Burnt



Fire frequency in the tropical savannas, with fire mapping derived from coarse resolution (~1 km² pixels) AVHRR imagery. Tropical savannas region north of line, derived from IBRA regionalisation.

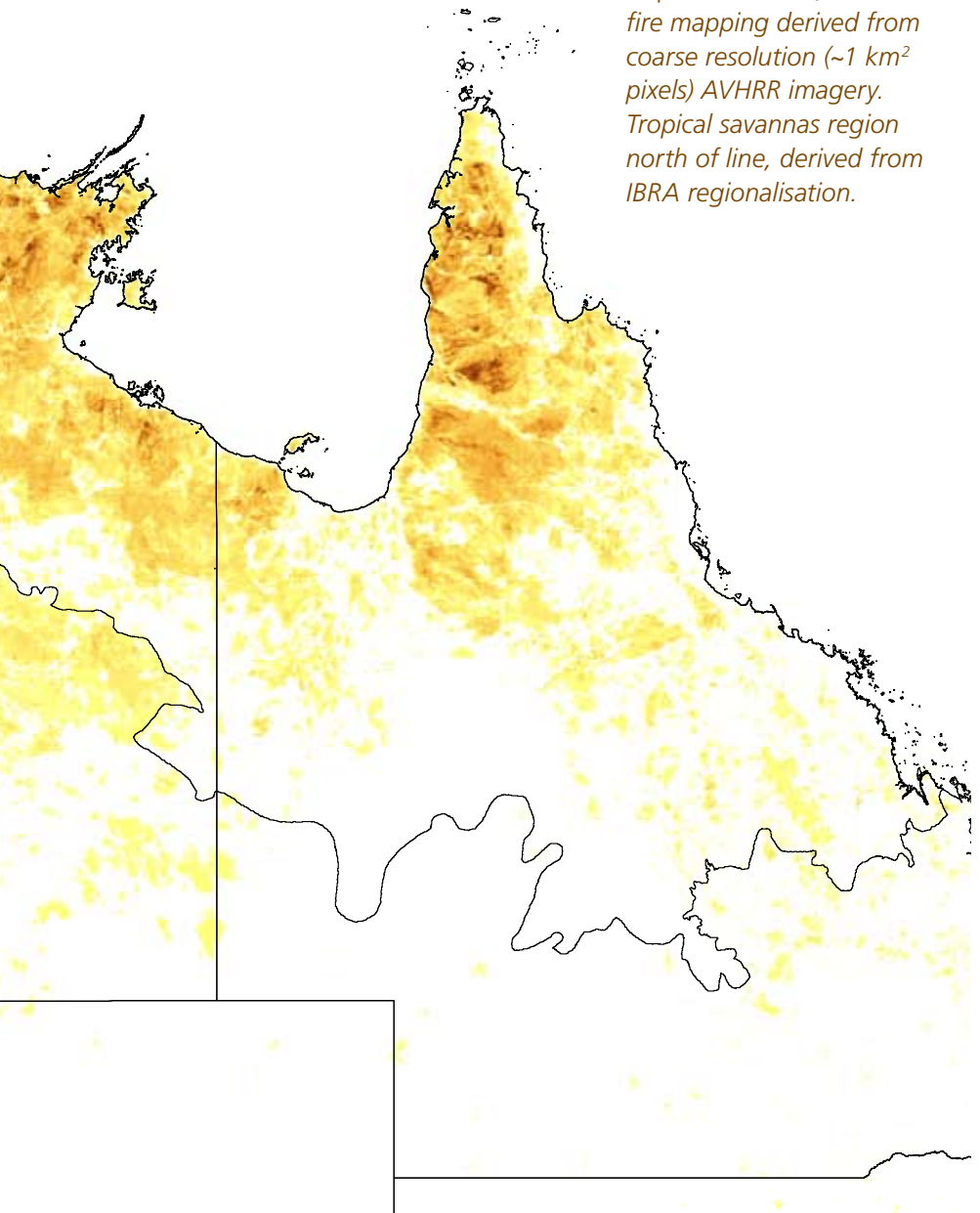


Figure 4: Bushlight Picture

*Bushlight project at Ukaka, east of Alice Springs,
Northern Territory, Australia.
Photo courtesy of ICAT/Bushlight.*



3. In Focus: Indigenous Fire Management in Australia

Fire is a dominant conservation and land management issue for the Australian tropical savannas. Reliable monsoonal (summer) rainfall and sustained high temperatures drive periods of rapid plant growth alternating with intense seasonal droughts of more than 6 months when no rain falls, evaporation rates are high and grasses cure rapidly. This regular annual cycle of several months of rapid fuel production, followed quickly by an equivalent or longer period of dry, often windy conditions that favour ignitions and fire spread, make the grassy savannas extraordinarily fire prone.

Carbon is removed from the atmosphere in rapidly growing grasses in the wet season and then much of it is released rapidly when oxidised by burning in the dry season. For the purposes of carbon accounting, the resultant annual pulse in emissions of carbon dioxide from burning is treated as being entirely re-captured in the next cycle of rapid growth. Savanna burning is assumed to cause no net carbon dioxide imbalance over timescales relevant to behaviour of the atmosphere. However, some other potent greenhouse gases produced in biomass burning, including methane and nitrous oxide, have persistent effects, because equivalent volumes of these greenhouse-effective gases are not so directly returned to plants or otherwise removed rapidly from the atmosphere.

Fire intensities vary markedly with season, being relatively mild and spatially patchy early in the dry season, when air temperatures are relatively lower and fuels retain some moisture. Little coarser woody fuel is consumed in most early dry season fires. But fires burn more fiercely in the late dry season, when ambient air temperatures are higher and moisture levels lower. As a consequence, more coarse fuels are consumed (Meyer 2004; Russell-Smith *et al.* 2008).

Uncontrolled bushfires, particularly toward the end of the dry season, can threaten rock art, bush tucker resources and other native

plant and animal species. They can also lead to greater emissions of greenhouse gases, particularly carbon dioxide, nitrous oxide and methane. Fire management is a part of customary practice for many Northern Indigenous Australian groups. These practices decreased in the 20th century as traditional inhabitants moved away from country. In recent times, local Indigenous people, scientists and others have been cooperating to record information on savanna wildfires in Northern Australia and to reintroduce fire management activities. Now it is also clear that seasonal variation in amounts and types of GHG production provides options to intervene in fire regimes in greenhouse-relevant ways.

Figure 3: Fire Frequency in the Australian Tropical Savannas
(please see colour section on page 28 for Figure 3)

3.1 West Arnhem Land Fire Abatement Project, Northern Territory

Development of the West Arnhem Fire Management project first started in 1997, with support from the federal government (Natural Heritage Trust) and local communities, in particular, the Northern Land Council and Aboriginal traditional owners and organisations from part of West Arnhem Land. With the cooperation of the Cooperative Research Centre for Tropical Savannas Management in Darwin and local communities, the project has involved the development of strategic fire management practices.

The project uses traditional Indigenous fire management practices together with modern scientific knowledge to better control the timing and intensity of savanna fires. This includes cross-cultural planning and assessment, long cross-country bush walks, burning programs (undertaken increasingly by traditional landowners) and fire-mapping technology (see <http://www.firenorth.org.au/>). The project seeks to increase the proportion of early dry season fires to create fire breaks

and patchy mosaics of burnt country to minimise late dry season burning to 15–20% of the landscape.

In 2006, the project received funding from Darwin Liquefied Natural Gas (DLNG). An arrangement was established between DLNG and the Northern Territory government, and another arrangement was established between the Northern Territory government and the relevant local communities to enhance strategic fire management practices in part of West Arnhem Land to offset some of the greenhouse gases being emitted at the Liquefied Natural Gas plant of the DLNG consortium at Wickham Point in Darwin Harbour. Under this arrangement, the DLNG consortium is providing funding to the Northern Territory government, which is directing \$1million a year for 17 years to the West Arnhem Land Fire Abatement project.

It is anticipated that this can save around 100,000 tonnes of CO₂e emissions per year. Other benefits include passing on traditional ecological knowledge, better protecting the natural and cultural values of the plateau, encouraging a return to country and providing a social and economic stimulus for local Indigenous communities. In 2007, the project was awarded an Australian Museum Eureka Prize for its innovative solution to climate change.

At present the project is not part of any regulatory trading scheme, rather, it represents a one-off, private transaction in the unregulated market. However, the process and accounting practices used could be relevant to the future Australian emissions trading scheme. Moreover, the approach has significant potential for application in other fire-prone regions of Australia by way of other private transactions on the unregulated market.

The project provides offsets for methane and nitrous oxide emissions only, as carbon dioxide emissions may be 'reabsorbed' by new plant growth after a fire (IPCC, 1996). It is also worth noting that under

some schemes and private transactions, greenhouse gas abatement projects must involve emissions caused by people, not nature.

For more information, see:

■ http://savanna.cdu.edu.au/information/arnhem_fire_project.html

3.2 Options for engagement of Indigenous fire managers with markets

WALFA is the first example of commercial support for large-scale delivery of ecosystem services in northern Australia. The long and comparatively large financial commitment by major industry is an important feature of its success to date because it has helped consolidate earlier initiatives and generated confidence for others to invest both financially and non-financially. Clearly, non-government support with its strong contractual underpinning is seen to be more robust than the idiosyncratic and often short-term support available under government programs that change in response to political or budgetary pressures.

The emergence of the carbon market has added to interest among Indigenous groups in strengthening links between land ownership and the management skills and obligations associated with it, and the potential for payments based on formal recognition of the economic value of Indigenous management activity. The array of possibilities has expanded with the federal government's commitment to develop a national emissions trading scheme (ETS). How might Indigenous fire managers connect their environmental management products with an Australian ETS, and how might the ETS be designed to facilitate Indigenous people's contributions to national targets in emission reductions through fire management? Below are some thoughts from NAILSMA.

Option 1: Direct coverage of fire-related emissions under the ETS

It is generally agreed that covering all significant sources of emissions within the ETS will optimise its efficiency and so keep down total costs to the Australian economy of meeting a given reductions target. However, agriculture presents many difficulties in measuring emissions, arising from the huge array of processes involved in agricultural production. Given the small size of many agricultural enterprises, attributing liability to individuals or selecting other appropriate points for imposing liability (producer, processor, distributor, wholesaler, retailer) presents particular problems. For these reasons, agriculture is unlikely to be a covered sector on initiation of the Australian ETS in 2010 (Garnaut Climate Change Review 2008). Nonetheless, because savanna fire is presently treated as an agricultural emission, it is important to consider the implications for fire management when agriculture is covered or, conceivably, considered for direct coverage separately from agriculture.

It is practicable to measure fire related emissions with reasonable accuracy and precision at large spatial scales (Russell-Smith et al. 2008), including those scales at which good coordination of ground based operations and reliable delivery on targets is demonstrably achievable. But at finer scales, attribution of fires to individuals faces the same classes of difficulties experienced by agriculture more generally. It is not only difficult to describe individual fires with the accuracy needed to justify assignment of liability for emission costs, but attribution also faces the particular difficulty of identifying the ignition source and the person lighting individual fires. Individual fires with a single ignition source often straddle property boundaries. Which individual or group should accept responsibility for emissions from multi-property fires originating outside those properties and ignited for purposes unrelated to production on those properties?

Special problems are also created for fire users who generate no income from their fire use but nonetheless use fire for legitimate purposes like conservation management, protection of life and property, or to meet other culturally dictated obligations involving fire. Is it reasonable or feasible to require impoverished Indigenous land owners and land managers to meet the carbon costs of activities that are entirely non-commercial but rather an indispensable part of Indigenous living? How will fire use associated with the exercise of native title rights like hunting be handled, especially if occurring outside Indigenous-owned lands.

It is difficult to conceive of a plausible monitoring, accounting and enforcement framework for attributing and obtaining payment for the many thousands of individual fires that affect the savannas annually. Effective fire management along WALFA lines will actually increase the number of individual (smaller) fires. The potential benefits in greenhouse gas mitigation of improved management of savanna fire are potentially large because the areas affected are so large: but the annual returns from WALFA assuming a carbon price of \$50 tonne⁻¹ CO₂-e are equivalent to about \$2.50 ha⁻¹. The transaction costs of administering an individual attribution system would most likely exceed such returns. We conclude that arguments against direct coverage of and hence full attribution and individual liability for emission from savannas fire are over-whelming.

Option 2: Direct coverage but with special conditions for Indigenous fire users

If fire were to be directly covered by an ETS, the particular circumstances of Indigenous people in northern Australia, as owners of large areas of land often unsuitable for orthodox production, could be recognised in part by total exemption from liabilities, or by issue of free permits to a ceiling at or below present average emissions.

A total exemption would offer no incentive for Indigenous landholders and residents to contribute to mitigation. Retaining potential for liability but issuing free permits (perhaps together with the option to trade permits not used) would confront all of the attribution problems identified above, which we have concluded rule out this option unless permit issue and surrender is rolled up into large spatial units. But achieving this large scale integration would then shift very substantial costs of administration to Indigenous groups without offering compensating benefits. Forms of liability being differentiated on race or culture would also work against the potential for Indigenous groups to partner with non-Indigenous neighbours to achieve regional-scale emission reductions.

Option 3: Savanna burning outside the ETS, but with the option to trade well-accredited emission credits with covered sectors

For the reasons already given, it may be desirable to avoid the large transaction costs of having savanna fire directly covered by the ETS. But to provide incentives for groups to combine their efforts to mitigate fire-related emissions, it may be useful to allow them to trade credits as offsets for industry sectors covered by the national ETS. The Garnaut Climate Change Review (2008) has proposed that no particular limits be placed on the options for covered sectors to access well-validated offsets to supplement purchase of permits issued under the ETS proper.

The WALFA experience indicates that offsets could be generated and priced at or under the unit level considered likely under a national ETS. The quantities of credits potentially available will, however, be small compared with total demand and, as a consequence, unlikely to significantly distort the compliance market. Indeed, it can be argued that there is likely to be sufficient information available to allow mitigation from better management of savanna fire to be taken into account in setting national emission reduction targets, reducing the already very small risk that special treatment of savanna fire might

weaken the effectiveness of the national ETS. However, the approach adopted would need to be fully documented and details made available to other parties who may have interests in using particular credits generated in Australia or allowing trade between their national schemes and Australia's.

Option 4: Savanna burning outside the ETS and credits not acceptable under the ETS, but well-accredited projects operating in voluntary market

If, for ideological or other reasons, a "purer" ETS is desired, it may be determined that no offsets generated within uncovered sectors should be available to covered sectors. In this situation, north Australian fire managers may still be able to trade into voluntary markets, which currently accept credits subject to a range of accreditation mechanisms of varying rigour. Price is influenced by the quality of accreditation, so it will be important that savanna fire managers entering such markets seek and achieve the highest standards. There appear to be no technical obstacles to savanna fire credits meeting the highest standards.

Indeed, because generation of savanna fire credits will often also generate biodiversity conservation and other benefits for landscape function, plus social benefits, they may command a premium in voluntary markets which are accessed by industry in part as demonstrations of good corporate citizenship. Multiple benefits delivered by Indigenous people may be an important attraction in such marketplaces.

Option 5: No trading, but direct support of fire management activity to meet emission reduction targets

The Australian and Northern Territory Governments both support Indigenous land managers in various ways to deliver services that maintain the condition of landscapes and natural resources. The

Australian Government's Working on Country program and the Territory's legislated joint management initiative are important examples. Other north Australian states are also engaged in work of this sort. There is no reason in principle why similar programs of support should not be developed to deliver specific national and sub-national targets in GHG mitigation across the savannas.

However, Governments and some Indigenous commentators have urged greater involvement of Indigenous people with the mainstream economy. Developing enterprises to enter carbon markets could be an important pathway to wider involvement or, in remote regions where the market economy is largely absent, the only option for such interaction. Further, Indigenous individuals and organisations are suspicious of the durability of such commitments from Government and concerned at the high costs of complying with reporting and other program requirements.

Depending on decisions about design of the national ETS, continued direct support for a specified period could be part of a longer term strategy to build capacity in a number of Indigenous organisations, designed to lead to additional opportunities through their entry to either or both compliance and voluntary markets.

4. Other Case Studies of Indigenous Involvement in Climate Change Mitigation Activities

Below are some examples of emissions trading or greenhouse gas reduction or offsetting projects that have involved Indigenous people.

4.1 Bushlight, Northern and Central Australia

Many remote communities in Australia are not connected to the electricity grid or to gas pipelines. This means that they sometimes lack access to a reliable and affordable source of power.

Funding and support for the installation of renewable energy systems, particularly solar power systems, is a great opportunity to provide a community with a more reliable source of energy while also reducing greenhouse gas emissions. Most commonly, this occurs when solar power (and sometimes wind power) replaces diesel or small petrol generators.

One programme that provides for this is Bushlight, which started in July 2002. Funded by the federal government's Australian Greenhouse Office, the programme is administered by the Centre for Appropriate Technology (CAT), which is based in Alice Springs and has offices in Darwin, Derby and Cairns.

Bushlight staff work with communities to help them plan and manage their energy services in a way that suits the community. They call this the Community Energy Planning process. Through this process, Bushlight staff work with local residents to ensure that residents have the technical and other information they need to be able to choose affordable, consistent and reliable renewable energy services to meet their energy needs. The process then involves the provision of training, information and resources to help communities design and build high quality, reliable renewable energy systems and to engage services to maintain these systems.

By July 2007, the programme had installed 97 renewable energy systems in remote communities in Australia and funding for the project was extended to June 2008.

For more information, see:

- <http://www.bushlight.org.au/default.asp?home>
- <http://www.environment.gov.au/commitments/publications/bushlight.html>

(please see colour section on page 28 for colour reference photos)

4.2 Biosequestration and Natural Resource Management, Far North Queensland

The 'Wet Tropics Biosequestration Project' is planned to be carried out under Terrain NRM, the natural resource management body of far north Queensland. The aim of the project is to develop emission reductions for sale on the voluntary carbon market through integrated, regional natural resource management by the landholders of Terrain NRM, one of which is an Aboriginal group. The project is based on Terrain's 2004 Regional Plan, "Sustaining the Wet Tropics: A Regional Plan for Natural Resource Management" and seeks to store carbon through biosequestration as well as to preserve biodiversity, provide for sustainable land use and help with natural resilience to climate change in the region.

The regional approach to the project provides a unique opportunity for many small landholders in the area to receive payment for ecosystem services. A range of natural resource activities will be involved, including afforestation and reforestation, farm forestry, assisted natural regeneration, avoided deforestation, grazing land management, and sustainable agriculture.

It is understood that at this stage, the involved landholders have taken part in field testing and have agreed in principle to proceed with contractual arrangements for the sale of their biocarbon.

For more information, see:

- http://www.climate-standards.org/projects/files/DegreeCelsiusFNQ_CCB_PDD_P001v5-small.pdf

4.3 Ikuntji Cool Community, West MacDonnell Ranges

The Cool Communities programme was funded by the federal government via the Australian Greenhouse Office and involved the collaboration of non-government environmental organisations. The programme, which has now finished, sought to work with communities, industry and government, to find ways to cut greenhouse gas emissions, save money and improve lifestyles.

One community involved was the remote aboriginal community of Ikuntji in the West MacDonnell Ranges, which was the smallest community to participate in the programme. The community, which has a solid social structure, had previously undertaken other environmental and health projects with success. Its particular Cool Communities project was to provide a rubbish collection service using wheelie bins to replace the previous practice of burning off rubbish. The project was considered to be a success in providing for a new rubbish management system and in raising awareness about energy, pollution and health issues.

4.4 Forestry Management, New Zealand

A national emissions trading scheme will be implemented progressively for different sectors of the New Zealand economy between 2008 and 2013. The first sector to be covered – as of 1 January 2008 – was the forestry sector. Under the scheme, eligible reforested land (certain forested land planted after 1989) can voluntarily enter the scheme

and receive emissions allowances, or 'New Zealand Units' (NZUs) for net increases in carbon stocks sequestered on that land. Additionally, owners of land forested prior to 1990 face certain obligations under the scheme if that land is deforested. This and the below-mentioned programmes are relevant because Maori are considerable landholders in New Zealand, including of forested land.

For more information, see:

- About the New Zealand emissions trading scheme: <http://www.climatechange.govt.nz/emissions-trading-scheme/index.html>
- About forestry in the emissions trading scheme: <http://www.mfe.govt.nz/publications/climate/emissions-factsheets/factsheet-17.html>
- The regulations governing forestry in the emissions trading scheme: <http://www.legislation.govt.nz/regulation/public/2008/0355/latest/DLM1633759.html>

In addition to the recently developed New Zealand Emissions Trading Scheme, a number of other domestic initiatives aimed at mitigating climate change are relevant to Maori landholders in New Zealand. These programmes are relevant because Maori are considerable landholders in New Zealand, including of forested land. In early 2007, when the New Zealand Government was developing its emissions trading scheme and other climate change initiatives, it consulted with Maori. The report and related documents can be seen at <http://www.mfe.govt.nz/publications/climate/consultation-maori-hui-report-nov07/index.html>.

Permanent Forest Sink Initiative

The Permanent Forest Sink Initiative offers New Zealand landowners, including Maori, the opportunity to earn Kyoto Protocol assigned amount units (AAUs) when permanent forests are established. Restrictions are placed on harvesting and a permanent covenant is entered into between the government and the landowner. The scheme

operates separately to the New Zealand Emissions Trading Scheme, though it is possible that participants in the Permanent Forest Sink Initiative will have the option of switching to the trading scheme once the relevant legislation is in force (www.maf.govt.nz/forestry/pfsi).

Afforestation Grant Scheme

Under the Afforestation Grant Scheme (AGS), New Zealand foresters can receive a government grant for the planting of new forests on previously unforested land. Participants own the new forests and earn income from the timber, while the government retains the sink credits and takes responsibility for meeting all harvesting and deforestation liabilities. Additional environmental benefits are anticipated, such as erosion reduction, water quality improvements and better biodiversity outcomes (New Zealand Government, September 2007).

For more information, see:

- <http://www.maf.govt.nz/forestry/pfsi/>
- <http://www.maf.govt.nz/climatechange/discussion-document/15-afforestation-options.htm>

4.5 Wind Power Project, Colombia

In December 2002, the World Bank's Prototype Carbon Fund, signed an agreement with the utility company Empresas Públicas de Medellín to purchase 800,000 tons of greenhouse gas emission reductions from the Jepirachi Wind Power Project, located in the Wayuu Indigenous Territory in Guajira, Colombia. This led to the construction of 15 windmills that deliver power to Colombia's national electricity grid. It is anticipated that over 21 years, the project will prevent 1,168,000 tons of carbon dioxide emissions, which would otherwise have occurred if the power had been generated by conventional methods.

The Jepirachi Wind Power Project seeks to contribute to the development of the host Indigenous community by financing a series

of community-driven projects. The main features of the social plan are: training to facilitate direct and indirect job creation; the provision of a water desalination plant fed by wind power and the provision of water storage depots; and health and educational facilities.

The PCF will pay a premium of US\$0.50 per ton of emission reductions upon the implementation of the plan – in addition to the funds for the purchase of the 800,000 tons. The agreement sets out conditions for the payment of this premium, including verification that the social plan for the Wayuu people has been implemented. This is one of a range of World Bank projects that impact on or involve Indigenous people.

For more information, see:

- <http://carbonfinance.org/Router.cfm?Page=BioCF&FID=9708&ItemID=9708&ft=Projects&ProjID=9635>

4.6 Native Species Reforestation, Panama

The CO2OLUSA/Futuro Forestal project is seeking to create certified emissions credits for both regulatory and voluntary markets through sustainable reforestation in Panama. The project involves emissions reductions through: 1) sustainably managed commercial timber plantations; 2) reforestation in areas that will eventually be passed on to local communities who will be in charge of managing and protecting them to ensure the permanency of carbon storage; and 3) the protection of existing secondary forest areas that are part of the land that Futuro Forestal acquires for the implementation of its reforestation services. While the project is not being undertaken on Indigenous-owned land, it is employing a number of Indigenous people. In particular, its Las Lajas operation is close to the NgobeBugle Indigenous reserve and approximately 60% of the workers at this operation belong to the NgobeBugle Indigenous group.

For more information, see:

- <http://www.climate-standards.org/projects/index.html>

4.7 Renewable Energy Project (Biogas and Wind), Kenya

Renewable Energy for Sustainable Universal Ecology (RESCUE) seeks to develop local solutions to energy poverty, particularly through the use of wind and biogas energy. It seeks to train local artisans, some of whom are Indigenous, to build and maintain wind and biogas plants. In 2006 and 2007, RESCUE established a network comprising different groups working in the renewable energy sector in Kenya. Together with two partner members from Finland and support from the Finnish government, the network has launched a two-year pilot project to support the building of combined wind turbines and biogas units in Kenya. The project will run for over two years with a budget of 39,000 Euro.

For more information, see:

■ http://www.shalinry.org/Home_Page.html

4.8 Capacity Building for Natural Resource Management, Mexico

The 'Servicios Ambientales de Oaxaca, A.C. (SAO)' project received US\$286,800 from the Inter-American Foundation over three years from 2006. The SAO is working with residents and local authorities in ten Indigenous Zapotec, Chinantec and Mixe communities in the Oaxaca region of Mexico to improve their capacity to manage natural resources sustainably and to increase their income through offering environmental services such as carbon and water capture and biodiversity conservation. The programme will include community meetings, and training and ongoing technical assistance related to land-use planning, ecosystem mapping and monitoring, and the development of five tree nurseries on communal land.

For more information, see:

■ <http://www.iaf.gov>

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Annex I: Glossary and Abbreviations

Adaptation: Activities to address the effects that climate change is already having on land, ecosystems and livelihoods.

Afforestation: Developing a forest on land that has not been forested in recent times.

Annex I parties: Industrialised countries listed in Annex I to the UN Framework Convention on Climate Change. Nearly all of these countries are the countries that have binding emissions reduction targets under the Kyoto Protocol.

Anthropogenic: Human-induced. The term used to distinguish naturally occurring greenhouse gas emission reductions from ones that result from human activity.

Bali Action Plan: One part of the Bali Roadmap, the Bali Action Plan is the name given to a decision taken by the Conference of the Parties to the UNFCCC that specifically concerns negotiations on future amendments of the Convention itself. The decision establishes an 'Ad Hoc Working Group on Long-term Cooperative Action' ('AWGLCA') to consider a specified set of Convention-related issues, which are also set out in the decision, with a view to reaching agreement at the UN Climate Change Conference to be held in Copenhagen in December 2009 (UN Doc FCCC/CP/2007/L.7/Rev.1).

Bali Roadmap: The collection of decisions and conclusions adopted by the parties to the UNFCCC and to the Kyoto Protocol at the 2007 UN Climate Change Conference (Bali, Indonesia), which provide a *process* for agreeing to future revisions and additions to the UNFCCC and the Kyoto Protocol. The roadmap sets the aim of finalising all post-2012 discussions in all fora by the UN Climate Change Conference to be held in Copenhagen in December 2009.

Baseline: In seeking to measure whether greenhouse gas emissions have decreased or increased, it is necessary to have a known previously emitted amount (often connected to a baseline date or year), against which to make a comparison over time. This is called the baseline.

Carbon biosequestration: The storage of carbon by plants, trees and other flora, which absorb carbon dioxide from the atmosphere while they grow, release the oxygen, and store the carbon.

Carbon market: Transactions for the sale of emissions permits, reductions or offsets together comprise the 'carbon market'. In fact, carbon dioxide is only one of several greenhouse gases that can be 'traded'. Moreover, there is not a single, unified international market for emissions reduction purchases. Rather, there are various markets in operation around the world, which can be classified as either 'regulated' or 'voluntary' markets and which interact with one another in different ways.

Clean Development Mechanism (CDM): A facility created under the Kyoto Protocol, which allow as Annex I countries to finance emissions reducing projects in developing countries that are party to the Kyoto Protocol then to use the resulting 'certified emissions reductions' ('CERs') to offset their own emissions.

CO₂e: Not all greenhouse gases warm the atmosphere equally – some gases (such as methane) have a greater warming effect than carbon dioxide. To account for this, the term CO₂e is used and means that greenhouse gases other than carbon dioxide can be converted to the equivalent amount of CO₂, based on their relative contribution to global warming. This provides for a single, uniform means of measuring emissions reductions for multiple greenhouse gases.

Conference of the Parties (COP): The term used to describe the regular meeting of state parties to the UN Framework Convention on

Climate Change. This is the body with authority to take decisions under the Convention.

Conference of the Parties acting as the Meeting of the Parties to the Kyoto Protocol (COP/MOP): This is the meeting of state parties under the Kyoto Protocol and the body with authority to take decisions under the Protocol.

Controlled (or 'prescribed') burning: Intentional and controlled fires in bushland or forest designed to prevent more intensive, uncontrolled forest or bushfires.

Climate change: This term refers to the collection of impacts on the earth's natural climate system that are resulting from global warming (see below). This includes rainfall patterns and ocean levels, the direction and speed of wind and ocean currents, seasonal cycles, and the likelihood and intensity of climatic disasters such as droughts, storms and floods (IPCC, 2007).

Deforestation: The conversion of forested land to non-forested land.

Emissions trading (or 'carbon trading'): A sale and purchase of: 'permits' or 'allowances' to emit greenhouse gases; or 'certificates' that prove a certain reduction in emissions from a particular activity beyond what would otherwise have been the case (i.e. '*business as usual*' emissions); or certificates that indicate a certain amount of actual emissions have been 'offset' somewhere else, through for example, carbon sequestration.

Energy efficiency: Reducing the amount of energy used to operate a product or to carry out a process, without reducing the quality or level of service, or making the actual generation of electricity more efficient.

Forest degradation: Occurs when the structure or function of a forest is negatively affected, reducing the ability of the forest to provide services or products (FAO, 2004).

Fossil fuels: Gas, coal, oil and oil-derived products such as diesel. Fossil fuels are combusted to create electricity, to provide heating, to power all forms of transportation and to power industrial processes, like mining and manufacturing activities.

Global warming: As the human-induced emission of greenhouse gases has increased, so has the concentration of these gases in the atmosphere, which is raising the earth's temperature.

Greenhouse effect: The process by which greenhouse gases in the earth's atmosphere (see below) absorb infrared radiation from the sun, reflect some of it back into space and emit some of it towards the earth. This natural process provides for relatively stable and mild temperatures on earth and in the atmosphere. However, human activity can change the concentration of greenhouse gases in the atmosphere, which can amplify the greenhouse effect.

Greenhouse gases (GHGs): A group of gases in the atmosphere that absorb infrared radiation. They appear in greatest proportions in the earth's lower atmosphere. These gases include water vapour, ozone, carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons and sulphur hexafluoride.

Joint Implementation: A facility created under the Kyoto Protocol, which allows an Annex I party to fund and/or run a project to reduce emissions in another Annex I party. The funding country can then apply the emissions reductions generated to help it to meet its own emissions target under the Kyoto Protocol.

Kyoto Protocol to the UN Framework Convention on Climate Change: a subsidiary agreement to the UN Framework Convention on Climate Change, this agreement was concluded in December 1997 but did not 'enter into force' (become legally binding on its parties) until February 2002. This Protocol is binding under international law on those countries that are a 'party' to it.

Land use, land-use change and forestry (LULUCF): This is an identified category of activities that can contribute to both greenhouse gas emissions and emissions removals. The other main categories are energy-related emissions (both production and consumption), agriculture and waste-related activities.

Mitigation: Seeking to reduce the amount of greenhouse gases released into the atmosphere by human-related activities. Such actions might include reducing our use of fossil fuels and changing the way we use land – such as by reducing our rate of land clearing and deforestation, and increasing our rate of reforestation.

Non-Annex I parties: Developing countries not listed in Annex I to the UN Framework Convention on Climate Change. These countries do not have binding emissions targets under the Kyoto Protocol.

Party: The individual members of a legal agreement, such as the member states of an international law agreement (like the UNFCCC), or the individuals or organisations that sign a private contract.

Reducing emissions from deforestation and forest degradation in developing countries (REDD)

Reforestation: the reestablishment or regeneration of a forest.

Removals: This is the opposite of an emission of greenhouse gas and occurs when greenhouse gases are removed from the atmosphere, for example, by trees during the process of photosynthesis.

Renewable energy: This form of energy can be used to provide electricity, heating or fuel for transportation similar to the way we use fossil fuels for these purposes. Unlike oil, gas and coal, renewable energy sources are not finite. Key sources include wood, waste decomposition, geothermal activity, wind and solar energy. The use of renewable sources for generating energy usually involves lower emissions of greenhouse gases than the use of fossil fuels does.

Sinks: Reservoirs or locations that sequester or store a greater amount of carbon dioxide than they release. Major carbon sinks include forests and oceans.

Subsidiary Body for Implementation (SBI): a subsidiary body to the UNFCCC and Kyoto Protocol, which considers and advises the parties on issues relating to the implementation of the Convention and Kyoto Protocol.

Subsidiary Body for Scientific and Technological Advice (SBSTA): a subsidiary body to the UNFCCC and Kyoto Protocol, which considers and advises the parties on scientific and technological issues related to the Convention and Kyoto Protocol.

United Nations Framework Convention on Climate Change (UNFCCC): An international agreement, which was reached in 1992 and entered into force in 1993, the UNFCCC provides a framework for international cooperation on climate change.

The United Nations University Institute of Advanced Studies (UNU-IAS) is a global think tank whose mission is “to advance knowledge and promote learning for policy-making to meet the challenges of sustainable development.” UNU-IAS undertakes research and postgraduate education to identify and address strategic issues of concern for all humankind, for governments, decision makers and, particularly, for developing countries.

The North Australian Indigenous Land & Sea Management Alliance (NAILSMA) is an unincorporated bioregional forum for Indigenous land and sea managers across North Australia. It aims to support practical Indigenous land and sea management using strategic approaches to care for country with an emphasis on practical management by Traditional Owners across the whole of the North. NAILSMA is an alliance between Kimberley Land Council, Northern Land Council, Carpentaria Land Council Aboriginal Corporation and Balkanu Cape York Development Corporation.



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