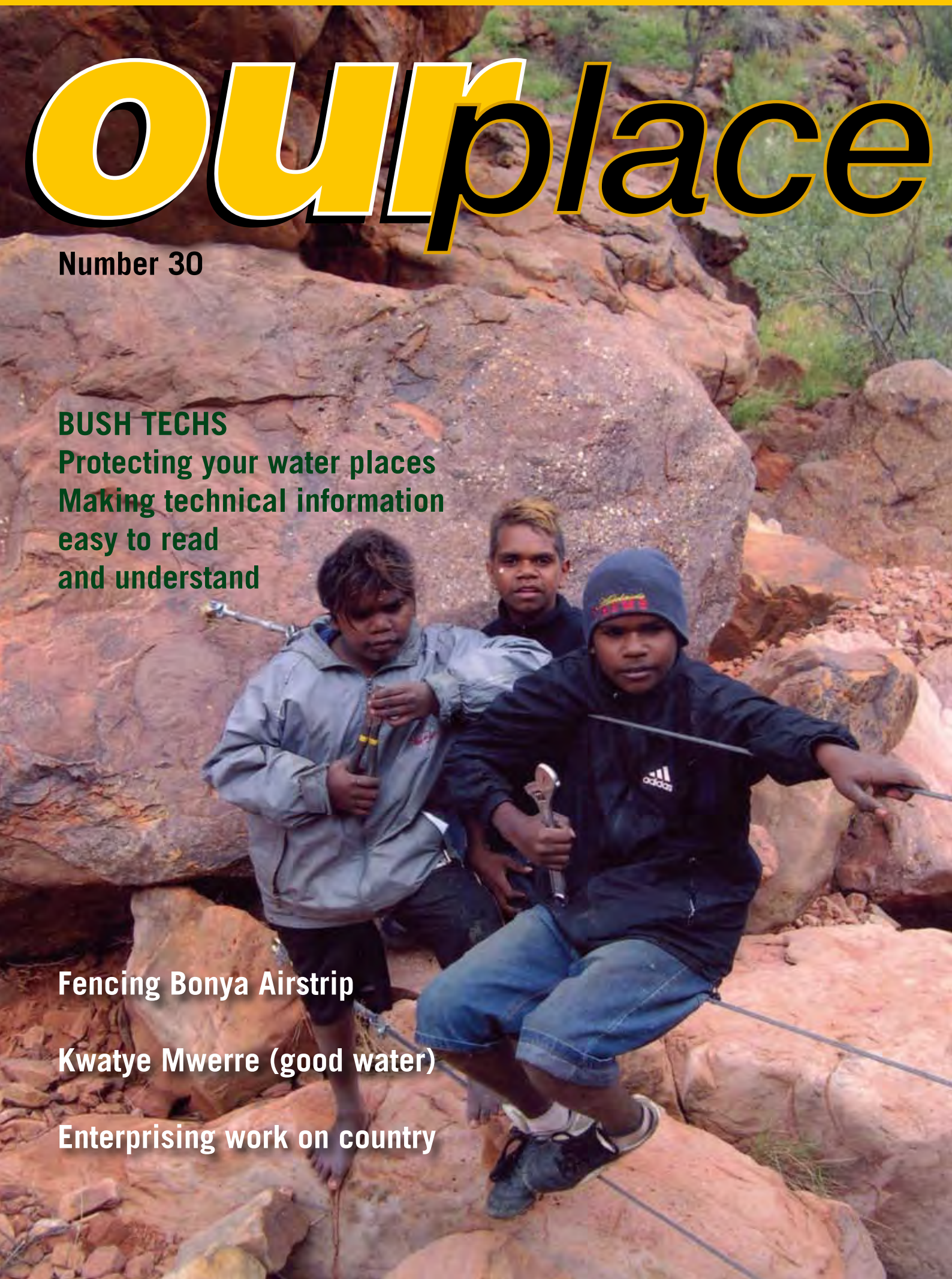
People working with technology in remote communities

ourplace

Number 30



BUSH TECHS

Protecting your water places

Making technical information easy to read and understand

Fencing Bonya Airstrip

Kwatye Mwerre (good water)

Enterprising work on country

ourplace
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In this edition of *Our Place* we reproduce a powerful speech given by local elder Rosalie Kunoth Monks at the Desert Knowledge Conference last November. On page 7 Nerida Beard outlines some of the key challenges for remote community water supplies. On page 10 Peter Renehan gives an in depth look at the Integrated Technical Services field work underway north east of Alice Springs.

On page 16 Jocelyn Davies provides a thought provoking article that draws on recent research undertaken in the Spinifex deserts regions. It explores using market based incentives to support work on country as well as biodiversity conservation. This is a timely article given the current political emphasis on supporting real employment opportunities for Aboriginal peoples and managing the impact of climate change.

Elsewhere we have an article looking at the development of the Desert Peoples Centre and on page 17 Andrew Crouch provides an overview of the One Hundred Dollar laptop project. Our BUSH TECH #35 looks at protecting your water places using the CAT camel fence and BUSH TECH #36 presents some tips for making technical information easy to read and understand.

We hope you enjoy this 30th edition of *Our Place.*

Metta Young
Policy Impact and Communications Manager
Centre for Appropriate Technology
Alice Springs

Front cover

Children from Santa Teresa at Salt Spring assisting Greening Australia re-strain the cables of the CAT camel fence.

Our Place
ISSN: 1325-7684

Our Place is published three times a year by the Centre for Appropriate Technology, an Indigenous science and technology organisation, which seeks to secure sustainable livelihoods through appropriate technology.

Subscriptions: Free to people living or working in Indigenous communities.
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Opinions expressed in *Our Place* are those of the authors and not necessarily those of the CAT Board or staff.

WARNING This magazine contains images of Indigenous and non-indigenous people. Caution should be exercised while reading this magazine, as some of these images may be of deceased persons.

Our Place Number 30, 2007

32 Priest Street, Alice Springs NT 0870
Print Post: 545270/00016
Production/design: Jo Boniface
Bushtech design: Iben Hansen
Editing: Metta Young, Peter Taylor
Printing by Colemans Printing

The production of *Our Place* is funded by the Department of Families, Community Services and Indigenous Affairs.

Rosalie Kunoth Monks.

Land and Culture, necessary but not sufficient for the future: identity in the 21st Century

Speech given by Rosalie Kunoth Monks at the Desert Knowledge Conference, Alice Springs, November 2006.

There have been many fine words written and spoken about Aboriginal land and culture over the years. I would like to heartily endorse all of the positive sentiment that has surrounded these writings and the good intentions of the writers.

It has long been argued passionately that without land we are nothing and the combination of land and culture provides us with the 'compass' to life. If I look back at my past I can see where there is a picture of great cohesiveness within a tribal group that has arisen from a strong connection to land and culture. It is in this setting that the caring and sharing was real.

In the past sacred objects were positioned in places where they were essential to survival. The old people had the ability to read the environment and know when shortage of food or water or some other life giving force was imminent. They would tell us something was in short supply and we had to tighten our belts as it were. We were instructed not to hurt or take certain species until they had regenerated. In these times there was a reason for discipline, skin relations, sacred songs and performance of ritual because it strengthened survival.

Today I am left wondering and as a leader I am torn by my heart and my memories and at the same time I have to be honest with myself and my people and face the realities. When I visit my community now I no longer find cohesion. In place of caring and sharing I find sickness, violence and self-harm.

The sacred objects and the sacred ceremonies are few and far between. People are not attending, they take less time to learn and perform, stories are short cut. In many situations that I have been personally involved in where traditionally people mourned the dead and absolved the family and relations, I now find people can't wait to split the limited possessions of the dead. Where once I would pass my coolamon on to my grand-daughter now people are worried for the car, and the fridge and the clothes that are fought for around the graveside.

When I look for people seriously attempting to sustain themselves on the land, there are some who are hunting for recreational benefit, but few people seriously believe that hunting is more than this in sustaining life these days. Some family are on small parcels of land but don't have a plan for that land, even one that manages the availability of the resources on that land. There is very little denial in times of shortage and little adjustment to lifestyle or discipline involved in management of the environment.

We now want rewards in the form of money and possession, even though we don't convert these to new forms of wealth. Group hunting is gone, we don't bring common goods back to the community rather people stay out bush consuming things on their own.

The breakdown of law and order and the conspiracy of silence is a serious new issue to some. It is a concern to me that this has in fact been disappearing for some time and there is no longer a strong framework of land and culture to provide for and sustain the harmony and responsibility we were known for in the past. It is the case that in many parts the only dreaming is that of the people who yearn for the past and wish to tie us back to that past. Here I include Indigenous and non-Indigenous people. Increased technology and mobility in cars and phones has hastened these changes – and we can't go back. Our Indigenous instinct has been to try to adapt and connect on our own terms – but it is increasingly difficult.

In essence I am proud of my memories and my history but I am not proud of what we currently see and the way our younger generation is responding. We face a clash of cultures. We are all on personal journeys but ultimately we are all on a journey of change. We are not static museum pieces and we are now citizens of the globe not just our small 'nation' on traditional land. The irony is that the nostalgic view of Indigenous people is that we survived through adaptability and resilience – yet in the

face of globalism we appear unable to adapt. Some of our young Indigenous response has been to adapt and resist by borrowing from other cultures. How did hip hop get in there?

So what is it that is important to retain in this process of change. In times where land and culture appear to have forsaken us, what is it that we need to establish more than anything.
I put it to you that if we are to accept change then it must not come at the expense of identity.

The concept of identity is complex and includes the symbolic importance of land and culture but it also allows for an individual response to change. Identity as an Aboriginal person, acceptance of yourself, is the most important piece of knowledge that Aboriginal people can have for the future.

Identity is not a right as such, rather it is something you develop yourself. A lot of our people today do not know where they belong. They can't go forward and they can't go back and they are becoming aggressive and self-destructive. You lose your culture through the choices you take or the choices circumstance forces you to take albeit reluctantly. Culture cannot be taken away; it is given away or reinforced with every decision that an individual makes.

The other reason I think identity is important is that it focuses on a personal approach to the future by providing a sense of self that can survive outside land and culture. If we rely only on identifying with land and culture we become tied to customary practice rather than facing the future and what needs to be done today.

We can no longer be tied to the land through the old ways, although there are many as I said earlier who think romantically that we should always respond to new situations through customary eyes and practices without adopting new approaches. This is why the groups I am involved with have spent so much time working with desert knowledge because we need new knowledge and the situations we face are new situations.

The knowledge of the past is captured in the land and cultural practices that bound it together and made sense of it. Our knowledge for the future requires more than this. As an elder if you ignore this reality you are not being real to yourself or a true leader to your people. We can't get our rich history back; in fact many of the older people I talk with don't actually want it back. People are responding with their feet where they can. Where people have new knowledge and full understanding of that they make responsible and good decisions that help them to further establish their identity as Aboriginal people in 2006.

If we seriously look back at our attempts to live our culture over the changes of the last 30 years we would have to admit that we have not been able to sustain culture in the way I described it earlier. What it has done to our men, our women and our kids is now before us and it is not good. I think we have reached a point where we need to know our culture to what ever level is appropriate for our particular living circumstances but then move on to the decisions we have to make today to enjoy the benefits of living in 2006.

Noel Pearson talks about our ability to move in different orbits. His comments are carefully crafted around Cape York history and opportunities. I am worried about desert peoples.
In that regard one thing is sure. No longer is reliance on land and culture sufficient. People more and more use these as an excuse for not performing and not taking difficult decisions – they are locked into stationary orbit. One of our problems is that everyone else is trying to think of the solutions for us instead of resourcing us to learn lessons and make mistakes on our own.

What I am finding in the shared journey through the desert knowledge work is that we are able to learn side by side more. We are at a cross roads, we need to choose carefully and quickly.

I am hurting inside and I say this with huge pain – but for our survival this is where we need to go. We are on a path of cultural suicide if we continue to smash up against today's world. We have to begin by accepting some blame ourselves for the choices and decisions we have taken and accept responsibility for our future.

Being a victim cannot be part of the identity that we seek. Political correctness will not get us over the line. The keys to discovering our identity are in self-awareness, group awareness and our ability to access new knowledge through education and shared life experiences.

In the past we found identity through separateness. Our new identity has to be part of a much bigger picture. Aboriginal identity has to take us beyond land and culture.

Many people have been confused about the recent policy debates around viability and sustainability of communities and mainstreaming of services. These matters are seen by some as urgent issues. It is my belief that the confusion will only be resolved through a new sense of identity, because through that people will connect to future pathways of local, national and international interests. Government may shape the policy and funding environment, newspapers will provide commentary, but we are the ones who decide to accept or reject the opportunities presented.

I am sure that the significant population of Indigenous people in the NT will mean identity in desert Australia will be very different to the sense of identity on the east coast. The catalyst of change that we talk about in the Desert Peoples Centre has to begin with individuals making decisions to change. Neither the decisions nor the changes can be forced. The DPC is not compulsory education – it involves choice, commitment and a desire for change. For these reasons the DPC may be a point for debate and discussion but our desire is to bring a positive contribution to peoples journeys. The DPC will work with people and create an environment where they can explore their identity as global citizens living in desert Australia. Desert Knowledge provides space for us to develop a new kind of connection to country, across country and internationally.

My hope for the next generation is that we gather the new knowledge and make good decisions and make the change that will create our identity as a people of the world.

Rosalie Kunoth Monks speaking at the Desertmob Dancesite performance.

Bentinck Island, Gulf of Carpentaria.

Work kicks off in western Queensland

Over the next 12 months, staff in our north Queensland office will be working with two communities in western Queensland to support essential service delivery and maintenance on housing and community infrastructure. The project is called the Homeland Support Project and is funded by the Department of Families and Community Services and Indigenous Affairs.

The project's overall objective is to see people living safely in established sustainable communities and homelands of their choice, in this case, the homeland communities of Marmanya and Bentinck Island in western Queensland.

Bentinck Island is located in the Gulf of Carpentaria, approximately 40 kilometres southeast of Mornington Island in the Wellesley Group. It is the second largest of the cluster of continental islands known as the South Wellesley Islands. The island comprises a total area of approximately 13 883 hectares.

Marmanya is a small community located near Urandangie, approximately 197 kilometres south west of Mount Isa in north-west Queensland.

The project will focus on:

- Co-ordinating repairs and maintenance on community infrastructure. Initially, this will involve a technical assessment of existing infrastructure and essential services.

- Consulting with all stakeholders including community members, community groups and government agencies to research options for sustainable and cost-effective governance and service delivery.

- Identifying appropriate levels of community-based governance and servicing of community infrastructure. CAT will be providing practical training and support to community members and governing groups where needed – our aim is to develop and support community capacity.

- Recommending sustainable options for future governance and service delivery arrangements.

For more information contact the CAT Cairns office on (07) 4031 0505

Improving communications services in remote Indigenous communities

The Centre for Appropriate Technology has been successful in winning three Regional Agent contracts through the Commonwealth Department of Communications, Information Technology and the Arts (DCITA) as part of the Backing Indigenous Ability (BIA) telecommunications program. The work of Regional Agents is to visit communities and provide information about what telecommunications support is available through the BIA program and also identify any infrastructure issues, needs and potential demand for telecommunications services in each community. Regional Agents can assist communities with the application process for Internet access, Videoconferencing, Training and Skills development and developing Indigenous Online content. They will also help with setting up videoconferencing and internet access facilities, make sure they have been installed correctly and are operational. Regional Agents will also support the community to use these facilities for social and economic purposes and assist with maintenance issues and technical troubleshooting.

CAT will be commencing work with communities in the North Queensland region (Townsville, Cairns and the Cape) the Queensland gulf country (Mt Isa and surrounds) and the southern half of the Northern Territory. Contact CAT on (08) 8951 4311 if you would like any further information.

Internet facilities at (top) Ali Curung (bottom) Nyirripi.

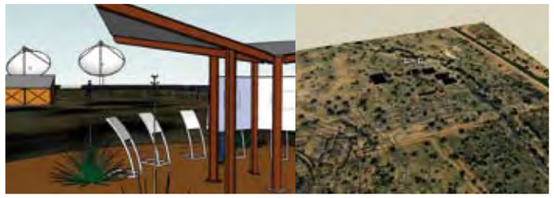
The CAT Board: long-serving and strategic leadership

Jim Bray with his portrait.

CAT recently held a presentation dinner to recognise the commitment and leadership of its Board members. Current Board members have guided the organisation for a combined total of more than eighty years. Whilst changes in policy, and funding have been volatile in recent years, CAT's Board has diligently focused on building a long term vision for the breadth and quality of the services provided by the organisation. This has seen the organisation double in size over recent years and secure a reputation for credible and effective technical services to remote communities of Indigenous people. The presentation dinner celebrated the outstanding contribution and years of consecutive service of the following Board members. Jim Bray, Chairman, 19 years of service to the Board, Jeannie Liddle,18 years of service, Jenny Kroker, 13 years of service, Frank Curtis, 12 years of service, Noel Hayes, 10 years of service, Rose Kunoth-Monks, 10 years of service. The dinner also welcomed Steve Hirvonen as a relatively new member of the Board. Board members were presented with Certificates of Appreciation. Jim Bray was also presented with a portrait commissioned by CAT and painted by Ron Talbot, an ex long serving CAT staff member.

The Solar Technology Demonstration Facility

An exciting and innovative new solar project is being developed in Alice Springs reinforcing its position as a major hub for the renewable energy industry in Australia. The Solar Technology Demonstration Facility (STDF) is being developed within the Desert Knowledge Precinct to demonstrate a range of solar energy technologies suitable for application in residential and commercial environments.



Simulated designs for the Solar Technology Demonstration Facility at the Desert Knowledge Precinct.

The facility will be highly visible and easily accessible to the public. The facility will demonstrate the solar technologies in a fully operational, commercially scaled, situation. It will promote the uptake of solar technology, provide training facilities for the maintenance and support of solar technologies, compliment the work of Desert Knowledge Australia promote the uptake of solar technology.

The STDF will consist of four components:
- an interpretative centre in a location readily accessible to the public,
- the actual technology demonstration systems,
- an education walk through the precinct, and
- an interactive website that provides live data feeds from the STDF and information on the operational performance of the different solar technologies.

The interpretative centre will provide information on the solar industry in general and in particular the technologies installed at the demonstration facility. Education programs for schools will also be developed.

Power production from the STDF will help level out the peak-load demands from the Precinct, particularly during the summer months.

Funding for this project has been provided by the Australian Greenhouse Office and the Northern Territory Department of Primary Industry, Fisheries and Mines (DPIFM) with funds from the Remote Renewable Power Generation Rebate Program. The project is being managed by the Centre for Appropriate Technology, utilising the knowledge generated by the Bushlight program, on behalf of the project proponent, Desert Knowledge Australia.

Student researcher tackles scale prevention

James Newman recently completed a Summer Scholarship with the Centre for Appropriate Technology. James, from the Wiradjuri Aboriginal Nation in western NSW, is a 3rd year mature-age student of Environmental Science at Southern Cross University in Lismore, with a diverse background in auto mechanics, tour guiding, television, the army and outdoor education. James had a keen interest in applying his recent science studies to water quality problems in remote communities whilst experiencing Central Australia.

The Cooperative Research Centre for Water Quality and Treatment (CRCWQT) fund a major component of the water research and technical advice program at CAT. Every year, CAT and other CRC research partners across Australia take on a student to work on a research project for 10 weeks over the summer university break as part of their national Summer Scholarship scheme. The scheme provides on-the-job research training for university students who are recently graduated or are commencing their final year of study. James was the recipient of an Indigenous summer research scholarship this year, and one of 16 summer students from around the country who delivered his project results back to the funding body in Melbourne at the end of his scholarship.

Images of James Newman's research work.

James' research project reviewed current off-the-shelf 'scale prevention' devices and evaluated their suitability for remote communities. Calcium scale is a problem in many central Australian community water supplies, causing blockages and eventual failure of tap fittings, shower roses, evaporative air conditioners and hot water systems and increases the frequency of maintenance required to pipes and household plumbing.

James' research report, entitled 'Technical review of small-scale, robust household scale prevention methods for use in remote area Aboriginal communities' is now available from CAT. James is now working with Desert Channels Queensland assisting traditional owners in western Queensland to record their traditional knowledge using digital technology.

To obtain a copy of the Scale Prevention report phone (08) 8951 4311 (or visit our website).

Kwatye mwerre: getting good water in Indigenous communities

Internationally, it is recognised that small communities experience greater challenges in maintaining reliable water supply and quality than their larger counterparts (NHMRC 2005, MoH 2005, WHO 2005). Regional Australian communities face these challenges too, particularly in small, remote settlements. In remote Australia, choices of water source are often limited. Vast distances limit external services, technologies can be unsuitable to local conditions and residents' skills and capabilities are frequently under utilised. Many systemic water supply failures can be traced back to a lack of targeted recurrent investment, care and attention, resident involvement and ownership, appropriate support and forward planning to effectively manage the risks to community water supplies. The end result is that small homelands and even larger communities are running out of water, or are inadvertently reliant on poor quality supplies.

After around thirty years of settlement and little recurrent funding or continuity in ongoing management, many of these community water supplies are experiencing problems with water quantity and/or quality, impacting on the service life of infrastructure, the utility of household hardware and the health of residents.

This article argues that the true cost of this 'failure management', is unavoidable long delays for residents between problem identification and response, often without water, and higher capital and maintenance costs for governments. There is both a need and an opportunity to harness local skills and capacity through developing local responses to water risks and linking these to regionalised support, to provide operational continuity for remote community water supplies.

HISTORICAL CONTEXT

In many of the nearly 1200 remote communities and outstations dotted across Australia, extraction of water for small community supplies is often through ageing stock bores or informal surface water extraction. During the 1970s, many Aboriginal people moved back to traditional homelands, settling near existing water sources such as old cattle station and stock route bores. Investment in infrastructure since that time by governments in housing, roads, schools, clinics and community centres have fortified these settlements across remote parts of the country, with water supply characterised by ad-hoc capital investment for breakdown replacement and little investment in recurrent operations and maintenance into the future.

CURRENT SITUATION

Nationally, over half the population of discrete Aboriginal communities rely on groundwater for their water supply, an estimated 48 511 people, living in 694 locations nationwide (ABS 2007). There is a growing body of evidence that community water supplies are under-maintained, and available quantities in many locations are in decline. Groundwaters in arid areas also commonly consist of high concentrations of minerals, often described as 'hard water', that can cause problems for infrastructure such as rapid failure of hot water systems, air conditioners and toilet cisterns, and are unsuitable for many urban household technologies designed for softer waters. Residents often make minor band-aid improvements with available skills and little support. Infrastructure is most often only funded and replaced if it has catastrophically failed, and governments are forced to 'bail out' a failed water supply at great expense. Keeping water supplies functioning in an affordable and efficient way in Australia's remotest areas appears to have been systematically unaddressed.

Exceptions may exist in few cases, perhaps where communities near regional centres have been connected to town supplies, or larger communities may have secured ongoing maintenance by a recurrently funded service provider. However, recent ABS national survey data shows that over half of the discrete Indigenous community population (54%) living in settlements with greater than 50 residents are experiencing interruptions to their water supply; suggesting that even in these 'larger' Indigenous communities under service delivery regimes, there are largely unaddressed water supply challenges (ABS 2007).

Arguably, poor planning has been a contributing factor to depletion of bore water sources; the bulk purchasing and installation of water-intensive technologies without consideration for the applicability to local living environments (such as the urban flush toilet and evaporative air conditioners). The challenge in remote settlements is to utilise smarter (lower cost, more efficient, user-friendly) and more regionally-appropriate (to climate, geography, local skills) ways of gaining the basic services required to support healthy lifestyles, without the negative consequences of wasting valuable water and economic resources. In a climate of depletion of water supplies nationally, this challenge is no more keenly felt than in desert communities such as Mulga Bore. They have limited water source options and governance of their water supply is assumed by external agencies, themselves vulnerable to policy shifts, staff turnover and funding changes.

Water supply repairs at Mulga Bore.

MULGA BORE KWATYE (Water)

Mulga Bore is located approximately 250km north-east of Alice Springs, and is home to a fluctuating population of 60-100 Anmatjere and eastern Arrernte people, which can swell to over 200 people during cultural and social events. In early 2007, CAT was asked both by leaders of Mulga Bore and their local government agency, Anmatjere Community Government Council, to assist them to develop ways to tackle recurring water supply scarcity. In late 2006, Mulga Bore residents were fed up from experiencing daily water supply cuts, with the bore running out

Water system infrastructure and community consultation at Mulga Bore.

every afternoon; the Resource Agency staff were at wits end from paying contractors to drive from Alice Springs to fix the same problems again and again. A risk management approach was used which included consultation with residents and infrastructure surveys to identify risks and improvements to their water supply. Recommendations were provided to Anmatjere CGC and the Department of Families, Communities and Indigenous Affairs and included upgrades to existing aged infrastructure and the development of a risk management plan that:

- clarifies responsibilities of stakeholders for water services, funding and ongoing management
- clarifies communication mechanisms between stakeholders
- clarifies water system requirements and available skills
- identifies gaps and opportunities for developing local water management skills
- identifies issues for sustaining the water supply into the future.

SERVICE DELIVERY

Anmatjere Community Government Council (CGC) is a regional federation of 10 discrete wards, dispersed across seven pastoral leases (Holcombe and Sanders, 2005). The area covers a total land area of 3631km and includes the township of Ti-Tree, three Aboriginal freehold land parcels and six Aboriginal living area excisions one of which Mulga Bore is located within. Anmatjere CGC provides essential municipal services to these 10 wards, including water and energy supply, housing maintenance and other selected services. With just a few technical trade staff, a vast area to cover and reliance on small grants applied for annually, effective management of water supplies is difficult to deliver.

WATER SUPPLY

The water system at the community was inspected (sanitary survey), groundwater bores were tested for quality and flow, historical water data was obtained and the water supply history and current issues discussed with small focus groups of residents. The groundwater source appeared to be of adequate quantity, but locally restricted by the reliance upon ageing bore infrastructure and a legacy of poor maintenance. The kinds of population fluxes at a small community like Mulga Bore can alone present a challenge for the provision of adequate water and sanitation.

There are well-sized water storages at the site and no sources of biological contamination were evident. The source water quality is high in nitrates, which presents a health risk for bottle fed infants. (NHMRC 2004). In the past a reverse osmosis water treatment system had been installed, but without adequate planned maintenance, skilled operation, and the inability to meet the high costs associated with such treatment systems the technology failed. Such technologies are rarely able to be supported to their required operating conditions in small remote communities.

Although there was some resident knowledge of the nitrate issue in the water supply, there was not a clear understanding of the risks. A focus group was held with women in the community about how to manage the risk to infants and further follow-up work will be conducted to deepen this understanding. The chances of tapping a new supply in the vicinity, with lower nitrates are considered 'poor to nil' (Childs, 1990), so developing effective local processes for managing risks associated with the water supply is important. If managed appropriately, rainwater tanks can provide an effective backup system for clean drinking water, even in arid areas (Grey-Gardner 2002). Low water use appliances and waterless toilets would also assist to conserve bore water supply at the community. However, the community has concerns about who will pay for them, the need to define clear roles for who will service and maintain them and conduct ongoing maintenance. No technology can run without maintenance and there are local human hands with some of the skills that could be further supported.

EMERGENCY RESPONSE

During the assessment process, the ageing bore failed altogether, leading to the community being without running water for 10 days, exposing residents to acute health risks. The school toilet block was closed due to blocked toilets full with human waste. This was replicated in a number of the four shared community ablutions facilities. A few people reported short-term diarrhoea of indeterminate cause during the period; it is compelling to link this to the unsanitary conditions. An emergency response was supported by CAT consisting of carted water, bore repairs, harnessing resident labour and the significant goodwill of a nearby station owner who volunteered himself and three staff for the field repairs. Due to a long history of goodwill between the station and the people of Mulga Bore, the station owner was happy to donate his time and staff resources to help the community get their water supply operating again. Two Anmatjere men from Mulga Bore who had worked on the station also applied their skills for the day. The water supply was reinstated through a mix of locally-available skills at comparatively low cost, but unfortunately the bore was so old and corroded it didn't last. The pump was then replaced giving the community and the support agencies some breathing space to develop long term plans to secure and maintain the water supply.

THE WAY FORWARD

Effective approaches to addressing water supply issues in remote Australia are needed. The Australian water sector nationally has a history of continual improvement to urban water supplies, and more recently developed a risk planning tool for managers of small water supplies. It remains important to clarify the end users of this tool and how small community residents can be assisted to use it to undertake risk management activities locally. A recent project supported by the Desert Knowledge CRC and the Commonwealth Department of Families, Community Services and Indigenous Affairs trialled the use of these tools with five remote communities. The approach required water practitioners to work alongside community members to identify risks to water supplies and locally-appropriate ways of managing them. It had positive results in supporting residents to more actively manage risks to their water supplies (Grey-Gardner 2007 {in press}).

There is a need for an honest acknowledgement that managing small water supplies in a way that keeps the water flowing, at a minimum, takes some skill, and more than being able to fill a tank. There is a need for a dialogue between community residents and the rural water and infrastructure services sectors to discuss new ways forward to improving water supplies in remote areas.

Currently the people who are filling the tanks are all too often located outside the serviced community, are overwhelmed with myriad functions and occupied with crisis management, 'putting out fires', with scarcely the resources and skills to devote to long-term planning and supporting communities to risk manage their water supplies.

Investment in infrastructure is a recurrent, essential requirement that needs to be backed up by clear responsibilities for recurrent maintenance, specialist forward planning and skills development. There may be scope for service provider arrangements to be negotiated regionally and enshrined in regional specific service agreements, providing an opportunity for adaptive models for maintaining basic services that combine elements of community management supported externally with longer-term water resource and infrastructure planning.

The factors which have led to Mulga Bores' water supply problems reach across the policy and funding environment at all levels. Many remote communities are not incorporated in formal environmental health or water industry systems which support regulation and management of water supply. In their absence, local and occasionally regional arrangements for self management have evolved over time. These arrangements are often overly reliant on the skills and expertise and attitudes of individuals - whether they be in funding and policy agencies, local or regional service providers or local communities. High turnover of skilled staff – typical in many remote towns and communities – makes this problem worse.

The current costly, and short-term practice of failure management is likely more expensive over time compared to proactive planning, regular maintenance and investing in local resident skills and abilities to manage their water supplies. Cost-sharing arrangements could be discussed. Communities such as Mulga Bore have already illustrated a willingness to pay for essential [energy] services where the quality, continuity and standard is maintained. This could be replicated with the community assuming a range of management responsibilities for their water supply if support standards, similar to that available for their energy supplies, can be agreed. There are also opportunities to strengthen the human capital of communities in the form of skills development, training and jobs, linked to rural economies, as the water industry is a large employer nationwide.

Formal risk management frameworks – which link available funding and community resources, through community engagement and understanding of water quality and quantity standards to practical measures and identified ongoing responsibility - may provide a better long term basis for systemically improving understanding of all stakeholders in remote water supplies with the knowledge and capacity to achieve more sustainable outcomes for remote communities.

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REFERENCES:

ABS (Australian Bureau of Statistics). 2007. Housing and Infrastructure in Aboriginal and Torres Strait Islander Communities, Australia, 2006, edited by B. Pink. Canberra: Australian Government.

Grey-Gardner, R. 2002. Mutitjulu rainwater tank and point of use water treatment system trial',. Paper read at 4th National Indigenous Environmental Health Conference Proceedings, at Adelaide.

Grey-Gardner, R. 2007 (in press). Remote Community Water Management Final Report. Alice Springs: Desert Knowledge Cooperative Research Centre.

Holcombe, S. and W. Sanders. 2005. Anmatjere: Representation in an early regional structure. Work-in-progress paper. Canberra: Centre for Aboriginal Economic Policy Research.

Ministry of Health. 2005. Small Drinking-water Supplies: Preparing a public health risk management plan. Wellington: New Zealand Ministry of Health.

NHMRC (National Health and Medical Research Council). 2005. Australian Drinking Water Guidelines - Community Water Planner: Australian Government.

NHMRC (National Health and Medical Research Council) & NRMMC (Natural Resource Management Ministerial Council). 2004. Australian Drinking Water Guidelines: Commonwealth Government of Australia.

WHO (World Health Organisation). 2005. Meeting on Small Community, Water Supply Management, at Reykjavik, Iceland 24-26 January.

Fencing Bonya airstrip: an example of ITS at work May - June 2007

ITS team at work fencing the airstrip at Bonya.

Integrated Technical Services (ITS) was implemented by the Centre for Appropriate Technology (CAT) in late 2006, and has started to focus on the Plenty Highway region in central Australia North East of Alice Springs. The ITS project aims to achieve sustainable and meaningful outcomes for remote Indigenous communities through trialling and demonstrating an integrated approach to all aspects of technical services: planning, delivery and ongoing management.

The Arramwelke Resource Agency is located at Bonya on the Plenty Highway about 400 kilometres from Alice Springs. Most of its services come by road with supplies for the store trucked in once a month with the mail plane coming once a week. The airstrip is looked upon as providing an important link between the community and the outside world both for mail but also for emergency medical evacuation if and when the need arose.

When Tim Day and myself from CAT met with Tony Hazelwood, the CEO of Arramwelke Resource Agency, to discuss the ITS project and to start scoping some ways of assisting the community, one of the main issues which came up was the airstrip. Pilots had complained that the airstrip was unsafe because of wandering stock and advised that the Royal Flying Doctor Service (RFDS) may not land there if there was an emergency. Also, doctors and other health professionals would visit more often if they could travel by air.

The airstrip is classified as an Aircraft Landing Area (ALA) which means that it is unregulated, it did not meet RFDS standard requirements and that a plane would only land at the pilot's discretion. Having a safe and reliable airstrip was a high priority for the community.

To become suitable for emergency use, the airstrip needed a number of improvements. The main priority was to put a fence around it to keep cattle out. As Bonya is surrounded by the Jervois cattle station, the biggest issue for pilots was having three major cattle pads going across the strip from grazing fields towards the east, to the nearest watering point on the western side of the airstrip. This meant that cattle were constantly traversing the area, as well as utilising shade trees on northern surroundings of the airstrip to camp during the hotter parts of the day. A fence would also help to keep cars off the airstrip, and it was agreed that a designated car parking area would be better. Another priority was to put in a pit toilet, some shelter and water supplies for use by people waiting for planes or to be picked up. The need for this was brought home by an incident in the Top End, where an elderly man was dropped off at a remote airstrip by the Health service, and then perished because of lack of water and shelter.

It was thought that there would not be a pressing need to have all the RFDS specifications from the outset; however it was understood that RFDS would be able to land there in emergencies during daylight hours, if some things were fixed straight away.

After taking some GPS readings, measuring the length and width of the airstrip and taking various photos, ITS was then armed with sufficient evidence to start making enquiries into standards, requirements and specifications of making the strip into what suited the needs of the community.

There was an agreement to work in partnership where ITS would assist the community with fencing the airstrip by providing some resources such as design expertise, equipment and transport. The ITS truck would be utilised by the community to deliver machinery and materials to and from town. In turn, the community would be able to provide some local labour, materials and the use of heavy machinery to assist with clearing, loading and carting of materials, as well as expert local knowledge too. This sharing of resources kept costs to a minimum.

To make sure nobody was at risk of being abandoned without shelter or water, ITS was to utilise a disused shade shelter from Old Bonya to be re-installed, with guttering, rainwater tank and sink facilities down at the airstrip. An old CAT pit toilet will also be relocated to the strip, and a hard stand area established for the planes to park and start-up, with tie down lugs included for particularly windy or stormy days. With sufficient strip length and width and a good package of other improvements most of the RFDS specifications could be met in the one job, and it would also serve the needs of the community. This was turning into a perfect example of how ITS could work.

At this stage ITS had fully recruited its Mobile Service Team (MST), and typical of the CAT way of doing things, Dave Allen and Karl Micek were in Melbourne and Tasmania one week and Bonya the next. Alice Springs local William Orr made up the MST. After collecting quotes, ordering then loading all materials the MST set out to Bonya to make a start on fencing the airstrip.

FIRST WEEK STARTING 14th MAY 2007

As in all cases of fencing we had to get all our measurements correct for corner posts, and ultimately, the fence line. Keeping in mind regulations for airstrip widths, the MST began working off a sketch plan drawn up previously by Tim Day on the initial scoping trip to Bonya. Jock, the local Essential Services Officer, was able to get hold of a grader from the nearby cattle station and cleared the proposed fenceline so we could run out barbed wire without entanglements. This was to be our guide to work off during construction of the fence; however there were times when executive decisions and changes were needed to be made onsite too. The corner posts needed to go in first to allow the concrete to cure before we could possibly strain any barbed wire, so we were furiously digging holes 1m deep by 300mm square at the top with crowbars and shovels. There were 26 holes dug for this stage of the works, with a further 25 later when chain mesh fence is installed around hard stand and taxi-way areas.

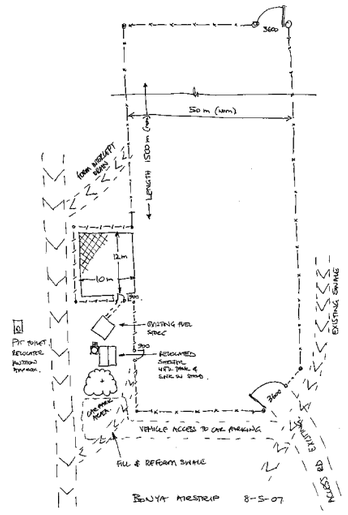
Many sweat filled hours later, both William Orr and myself proceeded to gather more blisters on the Dropper Knocker or "Dolly" by banging in as many star pickets as we could at 20m intervals between straining posts, at this stage the minimum length of fence line needed was to be 3km. The Dolly is a two and a half inch steel pipe about 900mm long with a closed weighted end that you slam down over the top of star pickets to drive them into the ground at about 350mm depth. If the ground is hard it can take anywhere up to 25 hits to get the picket to the recommended depth. Sadly the ground on the airstrip was very hard, especially if you have soft computer/office hands like me. William used this as a training exercise to keep him fit for the up coming Finke Desert Race in June so loved every minute of it (show off). Karl and David continued to dig and cement in straining posts at 500m intervals along the line, this distance was chosen as rolls of barb wire come packaged at that length. At this stage local CDEP labourers were not available due to being stranded at another location further along the Plenty Highway near the Queensland border.

SECOND WEEK STARTING 21st MAY 2007

This week was a continuation of the previous, but the addition of another two pairs of hands was greatly appreciated by the MST. Two local Indigenous employees at Bonya who wanted to do extra work to top-up their CDEP payments joined us. They were a fantastic example of young Indigenous workers who were very keen to assist in any way. When talking with Tony Hazelwood later he mentioned that having two Aboriginal people working on the MST (Willy and myself) greatly assisted these two men and made them feel more comfortable with coming to work over this week. In the past, most locals would only want to stay involved with contractors for a day or so, however both men are keen to travel to other locations or outstations to work side by side with the MST in the future. This has been a great result for ITS, and is how our Aboriginal Board has always wanted things to work in the past, as well as into the future.

William, Dennis and I were now running out four rolls of barbed wire at a time and then straining them onto the now cured concreted corner posts and straining posts. This was able to be done by improvising a 2m length of pipe attached to the back of the Toyota and placing the four rolls of barbed wire onto this to run out. Once you have tied the wire to the posts you just slowly drive the vehicle away towards the other post 500m down the track, then stop before the coils are empty. Tie wires, cut to size to tie the barbed wire onto the pickets, were placed then used to tie each strand of wire as it was strained. When all four strands were strained and tied to pickets it was time for the aluminium spacers/spreaders to be placed onto the wire at 6m intervals between pickets. They are supplied in bundles of 40 with nails and tools to place them on the barbed wire.

Whatever spreaders could not be completed this week were to be done next week by local CDEP workers, along with more levelling and clearing of the hard start area with local machinery. 1km of fence remains to be completed on return by the MST, with a shade shelter and toilet to be re-located and the hard-stand area paved. All of this can now be done between both parties as above, with sharing of costs, materials, labour and machinery. The installation of two cattle bayonets on the western side of the airstrip has also now been completed, to allow any cattle trapped inside the fence to get out without perishing, or needing someone to let them out through the two gateways installed by the MST. This was a staunch requirement from the station owner that was easily met through regular contact through the community. They really want to keep him happy as he has been good to the community for a long time, and assisted in the past where possible.



Mud –map of the airstrip upgrade plan.

This way all involved have had their needs met, and everyone is pleased with the outcome.

WRAP UP

Having gone from a point of despair earlier, about having to pay astronomical amounts of money to get anything done by contractors in the region, or even assistance or help, Bonya community can now see a little light at the end of the tunnel. This problem – one of many – seemed impossible to resolve just a few short weeks ago. The community have been astounded at the quality and quantity of work to date, and so have other service providers and users, such as pilots and station people from nearby who utilise the Bonya airstrip weekly.

Already the community are looking around for other possible projects that can be jointly approached using the same process as above. A couple spring to mind straight away, such as fencing of water tanks on a hill to make them stock proof, and placement of fire hydrants near houses on the water main ring loop, plus placement of overhead filling points near the workshop area for roadworks and fire fighting purposes.

This has been a fantastic example of Integrated Technical Services at work, and shows that communities only need a little assistance to make life easier in remote Australia.

Peter Renehan
Centre for Appropriate Technology
Alice Springs

The Desert Peoples Centre: 'a catalyst for change in the desert'

The Desert Peoples Centre is a consortium formed by Batchelor Institute of Tertiary Education (BIITE) and the Centre for Appropriate Technology (CAT). It was established as an organisational expression of the commitment of both organisations to work together to develop better, innovative links between education and training and other services to achieve more positive and sustainable outcomes for Indigenous Australians, particularly residents of desert Australia.

James Bray (CAT), Barb Richards (BIITE), Harold Furber (DPC Board) and Karl Hampton (MLA NTG) turning the sod.

Desert Indigenous people's outcomes from both schooling and vocational education and training (VET) are extremely poor. In recent years outcomes from VET have been declining suggesting that both the content and delivery of training programs are struggling to meet need and demand and respond to the range of work and livelihoods activities existing or emerging across the desert. Recognising that improved outcomes will not materialize from the same old approaches, the DPC seeks to implement evidence based changes that can secure improved educational outcomes and life choices for Indigenous people.

Respectively BIITE and CAT have substantial capacity in training, education and research relevant to the development needs of Indigenous peoples in desert Australia, and have established relationships with a wide range of Indigenous and non-Indigenous stakeholders.

Over time, the DPC is intended to:

- Explore and establish better opportunities for involving and empowering Indigenous people in the development of flexible and innovative education and training responses to their social, cultural and economic development needs
- Explore and establish stronger education training and employment outcomes through better configurations of training, education, case management of students/learners and enhanced pathways through post secondary education to employment, enterprise and community livelihood outcomes.
- Explore and establish opportunities to better link education and training activities with business and government in innovation and regional economic development.

It is intended that DPC will act as a coordinator and broker of services, a promoter of capacity strengthening and the development of sustainable livelihoods, an advocate for Aboriginal ideas and knowledge and a networker linking individuals and communities to service providers, government, business and industry, and education and training providers.

The NT and Commonwealth Governments have made substantial financial commitments to DPC in financing the development of DPC through the establishment of the Desert Knowledge Precinct which, from 2008, will provide a shared Alice Springs campus for BIITE and CAT.

The DPC will be sited at the Desert Knowledge Precinct alongside the Desert Knowledge Australia Business and Innovation Centre, the Desert Knowledge Cooperative Research Centre, the CSIRO, the NT Department of Primary Industries, Fisheries and Mines, NT Parks and Wildlife and Yirara Secondary Boarding College. This co-location has the potential to spearhead a range of opportunities for learners and consolidate pathways from school and into further training and work.

Building the Vision

A sod-turning ceremony to mark the commencement of the Desert Peoples Centre buildings was held on the 12th April 2007. The buildings will be clustered into theme service areas that reflect the capacity of the partner organisations and the range of skills, knowledge and existing and emerging work and livelihoods opportunities that underpin the cultural social and economic development of desert peoples. The theme service areas are: Language and Culture, Learning, knowledge sharing and communication, Well-being and human services, Human expression, Land and resources, Technology and Infrastructure and Livelihoods and economic futures. A residential complex and administration centre are also planned and a range of support facilities will be available to students on site.

Automotive course CAT; Pamela Lynch, Kaylene Hayes, Albert Mc Masters, Sheridan Lunch and Sabio George.

The first buildings of Stage 1 are well into their construction phases. Over the next year five buildings will be constructed ready for mid 2008. These are:

- Full commercial kitchen and eatery area
- Data centre, IT support and student support
- Trainer offices
- Wet science lab + food handling facility
- Clinic + training area

As the physical reality of the DPC precinct begins to take shape, the DPC Board have appointed a Business Development Manager to work with both CAT and BIITE in ensuring that the DPC vision is supported by informed and realistic long-term planning and implemented through practical focused measures for collaboration.

The Business Development Manager's primary roles will be to

- Facilitate an organisational change process across CAT and BIITE to secure the focussed commitment of Boards and staff on a practical and relevant vision to DPC partnership over the next 5 years.
- Implement a strategic planning process across both organisations to develop an initial strategic/operational plan for the DPC.
- Enhance the profile and understanding of the DPC vision among Indigenous communities, governments and business sectors (including DK Precinct partners) through awareness-raising.
- Identify strategic projects to demonstrate benefits of DPC operations, and broker and/or project manage their implementation.

A DPC Business Development Reference Group, comprising senior staff nominated by BIITE and CAT is being convened to support the business development and planning processes.

Communications Infrastructure

All Partners on the Precinct will have access to a fully integrated IP-based network. Some individual systems will be shared, some may not; but integration remains critical to the successful implementation of this shared campus, and the ICT infrastructure will support developing collaborations.

Driving this system design process is a clear vision; ***information technology that is reliable, relevant and transparent.*** This will lead to an integrated system that is fast, scalable and has the potential for linkages across our desert nodes.

Enterprising Work on Country: incentives for biodiversity conservation and well-being

The region

Across the Spinifex deserts of Australia's outback, a myriad of land use and land management activities occur. Many of these activities are linked to Aboriginal customary authority and responsibilities, including the teaching and use of traditional knowledge, food production and harvesting, and the maintenance of habitat resources. The biodiversity values of the region are comparatively high because the diversity of naturally occurring plants, animals and other organisms are still mostly present, with some special sites such as desert wetlands, and rare plants and animals. The relative integrity of Aboriginal traditional knowledge systems provides a distinctive resource and capability for biodiversity conservation.

Aboriginal people, numbering 14,500, form the vast majority of this region's sparse population. Incomes are very low and health very poor compared to national benchmarks. Arts and craft production is the main market activity. The most extensive land use is customary production of food, although production is low compared to tropical regions. Cattle grazing is a minor land use on the margins of the region. 15% of the region is managed as part of the National Reserve System including as Indigenous Protected Areas (IPAs) and around 64% is held under various forms of title by Aboriginal groups. The region is characterised by a very hot, dry climate, hummock grasslands (spinifex, Triodia spp) and acacia and eucalypt woodlands.

Land management activities

Aboriginal landowners are highly motivated to do some land management activities because the activities have a high private benefit to them. This benefit is, for example, through food production and recognition of their authority over country. These activities also often have direct or indirect benefits for biodiversity conservation, thus benefiting the Australian public at large. Some such activities are:

- burning, which creates habitat mosaics, and promotes availability of some plants and animals valued by landowners
- maintenance of water sources, such as removing silt from natural rock holes, which promotes habitat for water dependent native animals, and which also often involves landholders in fencing to exclude camels and other large feral animals
- customary and commercial harvest of plant foods.

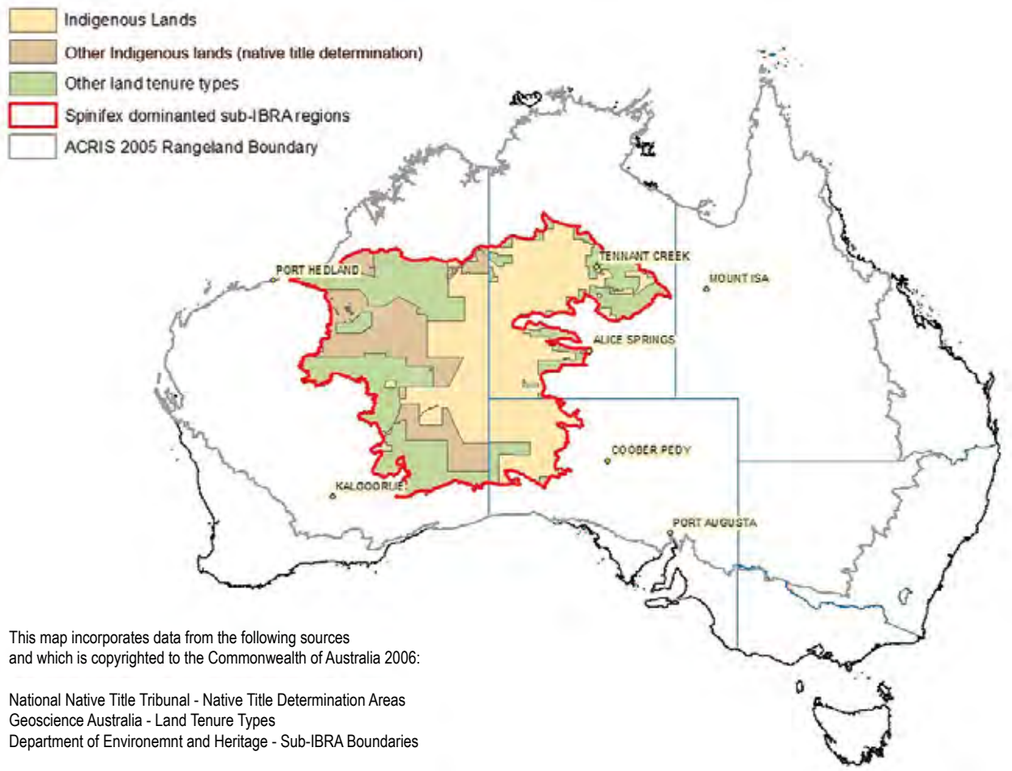
The value to the Australian public of these kinds of activities is typically not well recognised. This value comes in part from the landholders' actions in addressing threats to biodiversity such as changed fire regimes (from lack of patch burning) and feral animal impacts.

Aboriginal landholders don't necessarily set out to improve biodiversity, but this is the outcome of these kinds of land management activities. At the same time, landholders can have a positive impact on their own health, through better diet and regular exercise, and a positive impact on the social and psychological factors that are important to determining good health, such as a sense of control, and recognition of knowledge and skills. There are economic efficiencies from the time and other resources invested in land management activities because improved health and improvements in the natural environment are both being produced: the whole is bigger than the sum of the parts. Traditional knowledge and language are maintained through these activities. The observational and other skills generated also contribute to capacity for biodiversity conservation, to landowner motivation, and potentially to 'readiness' for other kinds of work roles.

Paid work can provide incentives for landowners to address threats to biodiversity that are not of inherent concern to them, such as weeds and high feral animal populations. But uptake of such work opportunities depends on other motivating factors being present such as a good relationship with the program coordinator/facilitator and an appealing team work approach that engages and builds on existing skills and knowledge. Respect for customary authority structures is important to all of this work – Tjukurpa is strong in the Spinifex deserts and no land management effort is sustainable unless this customary Law is respected.

Grant funded biodiversity conservation projects are usually undertaken by 'mid-level' organisations who operate across a region - the Land Management Units of land councils and landholding bodies, or conservation NGOs. These typically work with local organisations and individual landowners or small family groups but effort and outcomes are often dampened by short term funding and staffing turnover. Grant funding and training resources are supporting the development of community ranger groups in the region, particularly in the NT, with apparently valuable outcomes for youth development as well as biodiversity conservation.

The CDEP projects run by outstation resource agencies and community councils have been critical in providing paid work for many landowners in land management activities, providing infrastructure such as a payroll and an operating base, as well as base wages. Grant funding, often via the National Heritage Trust, provides critical support for project coordination, equipment and pay for landowners or 'top up' to CDEP wages. The transition from CDEP in the Northern Territory highlights the need for new ways of doing things.



Map of the Spinifex deserts and land tenure types.

Incentives for biodiversity

Landowners who invest time and money in maintaining and improving biodiversity generally get no reward in the market place – e.g. no higher price for the goods and services they produce. Thus they may have little incentive to manage their land for biodiversity. There is a case for enabling more overt incentives to be applied for biodiversity conservation outcomes from Aboriginal lands that can also spin off much needed economic, social and health benefits for those involved.

Market Based Instruments (MBIs) provide a way for landowners to get recognition for the value of the biodiversity benefits that come from their land management practices, and a way to encourage landowners to manage their land for biodiversity benefits. MBIs are policy tools that encourage certain behaviours through market signals rather than explicit directives such as regulation. MBIs are being increasingly used in Australian environmental management to 'reward' landowners for their investment in producing goods and services which are of broad public benefit. The behavioural change that is sought through a biodiversity MBI is in landowners' management practices, to conserve biodiversity of high value and to reduce threats to biodiversity. This approach to biodiversity conservation is being applied in the central Australian West Macdonnell Ranges, part of the Maintaining Australia's Biodiversity Hotspots Programme, using a stewardship approach led by Greening Australia and implemented by landowners who will bid for funds for stewardship activities which go beyond their duty of care.

Well designed MBIs have the potential to deliver outcomes at lower cost to government and with improved flexibility for landowners than many alternative policy options. However they require a good understanding of landowner motivations, the appeal of different incentives, the use of a market to find cost effective approaches and how these might interact with other factors affecting landowner behaviour.

Commercial bush harvest of plant foods provides some good pointers to understanding a market approach to biodiversity conservation. It is a rare example of market engagement in the Spinifex deserts that has developed with no government or Aboriginal organisation subsidy or support. Two things have been very important for this. Firstly harvesters (Aboriginal women) have the necessary knowledge and skills and can easily access the simple tools they need for harvesting as well as the permission they need under customary Law to harvest. Secondly, wholesalers, or traders (individuals, small enterprises and joint ventures), can link to harvesters, usually by face to face contact on bush trips for ordering and buying, and also link to people who want to buy the bush foods. Thirdly, harvesters and traders can understand the terms of trade: specific parts of a plant (eg fruits, seeds) cleaned and bagged are traded for a price per kg which represents the market price.

Commercial bush harvest engages harvesters willingly because financial incentives align with other incentives that have strong appeal to them. These are related to expressing cultural identity, pride and confidence from using customary skills and knowledge and recognising the value of the activity to 'outsiders'. Harvesters have flexibility in how they do the harvesting – they can combine it with other activities that are important to them, maybe getting food for family, or having a day out with kids and teaching them about country. Harvesters would not have this flexibility if they were being employed to collect bush foods, and paid an hourly or daily rate.

Commercial bush food harvest and market approaches to biodiversity are different because government is always likely to be involved in biodiversity conservation: government is the main 'buyer' of biodiversity conservation services all around Australia. Nevertheless there are many lessons for market approaches to biodiversity from commercial bush food harvest. One lesson is that the 'terms of trade' need to be

clear. Aboriginal landowners and government need a shared understanding of how the 'amount' of biodiversity that landholders maintain or enhance through their land management actions, and that government agrees to pay them for, is going to be assessed or measured.

In the Spinifex deserts market signals about biodiversity conservation will very rarely be detected by Aboriginal landowners unless they are communicated by mid-level actors. Individuals and organisations in this mid-level space are interpreters or 'translators' between government and Aboriginal landowners. Effective mid-level actors can engage with both groups, understand their motivations and incentive structures and contract and maintain accountabilities with both. In the commercial bush harvest of plant foods, wholesalers or traders fulfil this critical mid-level role.

Harvesters get their market signals through the actions of wholesalers. Wholesalers get market signals directly from their produce sales and their own market research. They understand enough about the resource and harvester activities to design supply systems and price incentives that meet market demand. In contrast, retailers and consumers tend to know very little about how the market signals they generate by selling and buying products containing bush harvested ingredients (or not doing so) actually impact on harvester behaviour.

Extending this supply and demand chain analogy to biodiversity conservation, government can be seen to be in the same position as retailers and consumers of bush foods. As governments 'turn the tap' of land management support funding on or off, they directly influence how much biodiversity conservation landowners do. Mid-level actors have an analogous role in biodiversity conservation to that of wholesalers in the bush food industry. Their relationships and communication with landowners are critical factors in translating incentives offered by government and other potential purchasers of biodiversity benefits into changed actions and behaviours by landowners.

A well developed biodiversity value chain for the Spinifex desert region would have several components.

Purchasers of biodiversity outcomes, such as governments and industry.

Brokers: mid level actors (organisations, enterprises and individuals) who understand purchaser requirements for biodiversity conservation and also the assets, capabilities and motivations of landowner collectives; who have clear incentives to make an effective match; and who have the capacity to negotiate with both parties to achieve effective contracts.

Landowner collectives with capacity to deliver to biodiversity conservation outcomes sought by purchasers (either directly, through a ranger workforce or by sub-contracting to other enterprises or individuals).

Individual landowners and family groups: members of landowner collectives whose behaviours and actions are regulated by effective social controls in place within the collective, such that their actions support the biodiversity conservation outcomes being pursued by the collective, or at least do not detract from those outcomes.

An enterprising biodiversity economy

Contracting for biodiversity benefits offers a key opportunity to support the development of an economy in Spinifex deserts in which landowners realise benefit from their extensive landholdings in proportion to effort rather than only seeking 'rent' or 'royalty' for use of the resources from those lands by others.

Biodiversity services offer one of very few potentially commercial land uses that Spinifex deserts Aboriginal landowners can pursue to address current welfare dependency. They also offer the strongest option for maintaining transmission of traditional ecological knowledge. Outcomes from well designed action to achieve biodiversity benefits also holds promise for considerable benefit to landowners' health and well being.

Arguably this integral relationship between knowledge, capacity, and the health and well being of landowners needs to be better recognised in national and regional planning for biodiversity conservation. Equally, the importance to Aboriginal health and well being of sustaining Aboriginal landowners' active engagement with their lands in the Spinifex desert needs to be more overtly recognised in approaches to Aboriginal development in the region.

A social enterprise model that values outcomes for health and well being as well as biodiversity outcomes is appropriate to developing capacity amongst landowner collectives for enhanced biodiversity benefits in the Spinifex deserts. 'Social enterprises' are organisations that trade in goods or services and link that trade to a social mission. Social enterprises are generally held to comprise the more business like end of the spectrum of non-government organisations, with at least half their income derived from trading rather than from funding.

The social enterprise model is appropriate to developing markets for biodiversity benefits in Spinifex deserts because of the array of interdependent human capital and social issues which now limit Aboriginal landowners' capacity for market engagement. Social enterprise development for biodiversity conservation could be pursued by matching two investment streams: investment from social sectors of government and philanthropic organisations in enterprise establishment, physical asset management, human resources development and governance; and a program to develop contracts in environmental monitoring and biodiversity asset management.

Key to the success of a social enterprise approach is recognition of the variability and seasonality of work on country, driven as it is by climate and geography. Flexibility and diversity in the range of activities pursued through contracts is important as is an incremental approach to building landowner capacity. The nature and role of landholder organisations that can function as employers and contractors for biodiversity services needs to be worked through, as does the identity and characteristics of effective broker organisations. Governments and industry readily purchase services in other sectors. This needs to extend to recognising and valuing the benefits of biodiversity services. The issue is paramount in this era of global warming because the threats to biodiversity are increasing, and because effective fire management for biodiversity will also have benefits for mitigating greenhouse gases.

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CSIRO Sustainable Ecosystems and Desert Knowledge CRC

Acknowledgements

Thanks to Nic Gambold, Rodney Edwards, Jo Maloney, Fiona Walsh, Josie Douglas, Central Land Council, Ngaanyatjarra Council, Stuart Whitten, David Campbell and other contributors.

The research on which this article is based was undertaken by the Desert Knowledge Cooperative Research Centre and its partners, funded by the Natural Heritage Trust and managed by the Australian Government Department of the Environment and Water Resources. Desert Knowledge CRC is supported by funding from the Australian Government Cooperative Research Centres Programme.

The views expressed herein do not necessarily represent the views of any of these parties.

One Laptop Per Child – recent developments in personal computers for children

The evolution of personal ICT

Central to the effective function of any community are the closely linked activities of information management and communications. Tools that enhance people's information storage, processing and communications capabilities have been around for a long time (writing, drawing and signalling beacons come to mind), but development of such tools (now generally referred to as Information and Communication Technologies or ICTs) has been particularly rapid over the past fifty years, with the dramatic miniaturisation and cost reduction of the underlying electronic technologies on which sophisticated tools have been built. The portable radios of the 1950s contained about 6 transistors; the processor alone in the latest desktop computers contains about 300 million.

Besse-Mae Renehan.

The personal computer is a well known example of the evolution of these tools. It began as a stand-alone information processing device about 30 years ago. Since that time its processing power has increased by many orders of magnitude and it has grown to incorporate an increasing range of communications and presentation features as well. Personal computers are now expected to be able to connect to the Internet as a matter of course, and to support a wide range of communications services, many of which they share with mobile telephone devices.

Because nearly all such devices now connect to a 'network' of some kind, the cost of using a personal computer is not just the cost of the hardware and software – there is a high cost associated with achieving this connection with the wider world, and because of the competitive commercial nature of the provision of networks and communications, the service providers build their own networks, much like the roads, railways and air routes of the transport system. This cost is of course passed on to the user in the form of account fees and call charges, except in cases where it is judged to be in the wider community interest to subsidise these services.

Innovation - making access easier

While personal ICT devices like computers are very common in many parts of the world and Australia, the high cost of ownership and connecting to the internet and the need for ongoing technical support and maintenance means that these are not yet so accessible to people in Indigenous communities. A new device under development that may help to change this situation, particularly for children, is introduced in this article - the 'One Laptop Per Child' (OLPC) computer.

The OLPC project

The OLPC computer project was launched in 2005 as a new research initiative of the Massachusetts Institute of Technology Media Lab in the United States. Its aim is to develop a low cost laptop computer — combining clever technology, large production volumes and low cost with the aim of making educational computing accessible to the world's disadvantaged children. The project is expected to move into full scale production later in 2007.

The computer is packed with technological features, and is currently targeted at the low price of around $AUD200, with the aim of achieving even lower prices over time. As well as offering advanced laptop computer features, it includes some features that are specifically designed for operation in challenging environments.

These include

- An 'electronic book' display mode that enables black-on-white viewing in sunlight with very low power consumption;
- The ability to operate at high temperature and humidity
- No rotating hard drive or other moving parts
- A sealed rubber membrane keyboard
- Rugged thick-walled construction
- An integrated carry handle
- A very low overall power consumption and a number of different ways to charge batteries.

Because the unit is intended first and foremost to be used in educational environments, it incorporates a number of special features that are aimed at adapting existing computing paradigms (for instance the desktop metaphor) to children-centred use and learning. The desktop view is replaced by an interface that is focussed on the child's activities (rather than applications) to facilitate social collaborative sharing of information within the class or community of other nearby computer users. The traditional file concept is replaced with a chronological journaling approach.

Drawing of the OLPC and key features by Naomi Kendall.

An important aspect of the shared educational experience is the ability of the computer users to network locally with each other. Beyond the immediate local class group, a low cost server approach is also under development to provide common functions like managed Internet access.

OLPC is an initiative that aims to provide the benefits of complex technology to a broad market, which can only succeed economically through spreading the enormous costs of development and manufacturing over very large scale production volumes. Inevitably, this demands the involvement of large buying organisations (typically governments) that can make bulk wholesale purchasing decisions on behalf of the people who will use these products at a community or personal level.

OLPC is aiming to deliver 5 to10 million of its first generation of laptops worldwide, with the United Nations and national governments as the intermediaries. Until now, the particular focus has been on children in developing countries with large populations and limited educational facilities, but there are many children in "developed" countries, such as Australia, who could equally benefit. A small number of sample units have been provided to special interest groups in Australia, including educational institutions. Discussions are also in progress between representatives of Australia, New Zealand and South Pacific nations with a view to presenting a proposal to OLPC for smaller groups in this part of the world to be included in the program.

Pointers to success

As highlighted by Laurence Wilson in an earlier 'Our Place' article (Key lessons for information and communication technology projects - Our Place no. 20 1/2003), international experience has shown that essential ingredients for success in ICT projects are a strong community demand for services, and the community's active participation in planning and implementation. Community members must appropriate the technology and 'own' the project.

The twin notions of appropriation and ownership imply that the community has a clear idea of the purpose to which the facilities will be put – many ICT projects have failed in the past because the equipment has simply been put in place to fulfil the supplier's own objectives.

When individuals are considering ICT or any other products and services that are offered to them, the same arguments apply, although at a more intuitive level. A person weighs up in their own mind how useful the product will be in helping them to do a particular thing, and they commit their own resources (money) to literally take ownership. If on the other hand the product is handed out without that essential assessment process taking place, success is left to chance.

These factors will be very much at play with the 'One Laptop Per Child' project.

Success of the program will ultimately depend not only on the technology, but on how it fits into the school educational environment to deliver learning benefits, and above all, how well the units are accepted and 'owned' by educators and children.

OLPC hardware and software

Music and audio applications including composition tools
High performance mesh wireless networking (802.11s) with the optional addition of a school server for backup, caching, content filtering, and library functions
High resolution display
Light weight hardware
'Transformer' hinged display for games or e-book use
1GigaByte non-volatile (flash) memory
Touchpad /stylus pointing
Linux-based open source software
Word processing
Programming applications
Web browsing
Video camera, speakers, microphone
Communications applications including email, chat and Voice over IP

International Support for Indigenous learning

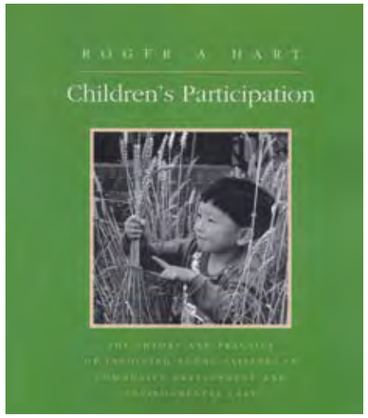
In August this year, the Gates foundation announced a prestigious Access and Learning Award of $1.25M to the Northern Territory Library to support the great work of the Library in providing Internet access and learning opportunities to remote Indigenous communities. The award recognizes the Library's Our Story database, which enables Indigenous people to preserve their stories and culture. This is the first time the award has been made to an Australian library.

Access to Computers and the Internet

Data provided by the Australian Bureau of Statistics Indigenous Social Survey 2002 showed that only 34.4% of Indigenous people living in remote areas of Australia had used a computer in the past 12 months, and only 21.6% had accessed the Internet.

References

National Aboriginal and Torres Strait Islander Social Survey 2002 Table 22 – ABS 2004
OLPC website www.laptop.org



Children's Participation

'Children's participation' was commissioned by the United Nations Children's Fund (UNICEF) and explores the issues of environmental sustainability, participatory processes and the role of children. It is based on the idea that children can and should be involved in the care of and responsibility for the built and natural environment. Hart argues that real participation of children relies on them being involved at a level appropriate to their age and development, and their participation being taken seriously rather than being tokenistic. It advocates for the inclusion of girls as well as boys and the mixing of age groups.

If this occurs, Hart argues, they will gain a genuine appreciation of democracy, a sense of their own competence and responsibility and a sense of caring for their local environment. Whether this is true is open to debate, but the many case studies and methods certainly provide food for thought. This book is a refreshing look at an often overlooked area of participation and will likely make the reader stop and consider opportunities for engaging, including and listening to children throughout projects, particularly in regards to the built and natural environment.

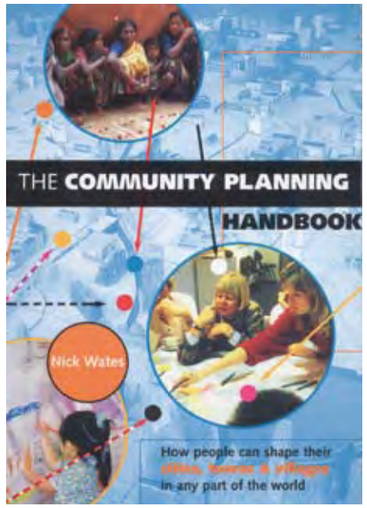
Children's participation: the theory and practice of involving young citizens in community development and environmental care (Roger A. Hart) Earthscan publications in association with UNICEF 1997. 200pp

The community planning handbook

'The community planning handbook' is similar to the previous book in that is based on the idea that projects should involve a sharing of decision-making and control. It also shares an interest in community development through the environment and includes examples from a diverse range of communities.

The handbook primarily explores highly visual, interactive methods that encourage two-way communication between stakeholders. Examples of these include action planning days, design games, model-making and websites. It is a useful source of inspiration at the beginning of collaborative projects, and an opportunity for experienced practitioners to reflect and review on their existing communication methods.

The community planning handbook: how people can shape their cities, towns and villages in any part of the world (ed. Nick Waters) Earthscan publications 2000. 230 pp



Books reviewed by Naomi Kendall
Centre for Appropriate Technology.

BUSH TECHS

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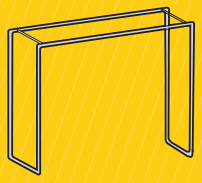

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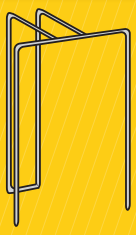

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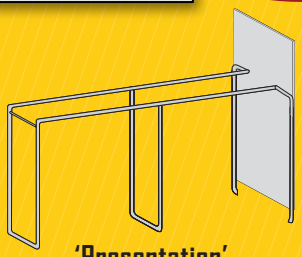

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The Centre for Appropriate Technology in Alice Springs is pleased to announce the release of the CAT Art Rack. The Rack has been designed to address the storage, presentation and access requirements of Indigenous art centres and commercial art galleries. The Rack and custom designed hangers hold finished canvas artworks that have not been stretched onto a frame.

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