SUSTAINABLE CONSTRUCTION IN REMOTE COMMUNITIES: A CASE STUDY FROM AURUKUN, AUSTRALIA

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Summary

Indigenous Australians living in remote communities are disadvantaged by prevailing economic and social processes and by a lack of investment and infrastructure, leading to community deterioration. This paper presents an example of how a government-funded project is using sustainable construction to help tackle these complex issues in a localised, community-driven approach in the remote township of Aurukun (Queensland, Australia). The Federal Government has embarked on a $48 million trial of new welfare arrangements for the Indigenous population northern Queensland, including initiatives in health, employment, and economic participation. Funded under the scheme is the construction of a community business centre in Aurukun, which will offer capacity for Indigenous businesses, including commercial/office accommodation and support services.

The project team responsible for planning the construction of a new community business centre evaluated various environmental, social, and economic considerations to determine that the refurbishment of an existing building (the old general store) was a more sustainable option than building new. The business centre, which will house offices, businesses, a mentoring service, meeting areas, postal services, and banking facilities, has a completion target date of November 2010. Green building principles and an environmental management system are being applied to the refurbished building in order to reduce energy use, lower waste production, minimise emissions, diminish water consumption, and decrease running costs.

Sustainable development in the context of remote communities requires that a balance be struck between environmental, social, and economic considerations. The Aurukun project is an example of an applied, appropriate sustainability approach to meet the needs of such communities. Currently, these needs are poorly elucidated among the remote communities of Australia, and it is hoped that the Aurukun project will both help other communities express their needs and assist government to respond with sustainable solutions.

Keywords: remote communities, Indigenous, Australia, sustainable construction, environmental efficiency, social and economic development

1 Introduction

In remote places within Australia, many communities lie hundreds of kilometres from major centres, making accessibility difficult and expensive. Responding to the housing needs of these communities, as well as managing major infrastructure projects, is

extremely difficult. Indigenous Australians living in these remote communities do not want to leave their native lands but do wish to live in similar conditions to inhabitants of the major centres. In addition to housing needs, Indigenous Australians suffer disproportionately from a range of health issues such as diabetes [1] and heart disease [2], have a significant gap in life expectancy compared with other Australians, and are affected by a range of deep-seated social problems and economic disadvantages. To date, the Australian Government has sought to provide health care, housing, education, healthy food, and basic necessities to support and promote the well-being of Indigenous people. However, the interplay of remote localities and urgent and ongoing housing and other needs are often viewed as insurmountable. A common perception is that there is neither enough money nor sufficient resources to make significant inroads into these problems.

This paper provides a case study of the Aurukun Transition Project, which is using sustainable construction to help address social and economic development issues in the remote community of Aurukun. Aurukun is located in Cape York, Queensland, 1000 kilometres north-west of Cairns, at Latitude 13°20'S and Longitude 141°45'E (Figure 1). In 2007, under the format of a government-funded trial of a new welfare and development scheme for the Indigenous population in Cape York, Aurukun Council requested the construction of a new building to house the local post office, bank, government departments' work stations, and training rooms, as well as providing computer access and retail shops for the community. However, when the project team assigned to this construction development arrived in the community to evaluate the location and the need for a new facility, it was discovered that there was an existing abandoned building (the old general store) in the centre of the town. Preliminary examination of the building determined that the structural integrity of the building was excellent, being constructed primarily of cyclone-rated concrete block and steel. However, the site posed several problems to overcome, including technical site issues (such as in-ground fuel tanks), administrative issues (such as land zoning), and social and cultural issues (such as dereliction and damage of the site).

Early in the development project, therefore, a decision had to be made as to whether a new building for the main business centre should be constructed, or whether an alternative (the refurbishment of an existing building) could be identified. The construction of a new business centre building within Aurukun would bring a major industrial process to this remote area which contains little or no industry. The process would use large amounts of energy and create various environmental and logistical problems, including: (1) A large, skilled and semi-skilled workforce would be sourced mostly from outside the community, leaving only labouring jobs for locals. The job issue was one important item but in addition the outside workforce would have no overnight accommodation and would put pressure on scarce food, water, and waste disposal facilities. (2) Heavy machinery would have to be transported over 1000 kilometres of dirt road. Considering the fuel being consumed in the transport of the machinery in a round trip situation, the logistics were energy-inefficient and hard to justify. (3) Large quantities of soil would need to be handled and removed. In addition, no sand and/or aggregates for concrete construction purposes are locally available and therefore must be trucked into the community over dirt roads on journeys of some hundreds of kilometres, again consuming large amounts of energy and generating CO_2 emissions. (4) New construction would involve significant inputs of embodied energy related to construction materials, primarily concrete and steel. It would also involve significant deliveries of building materials, which is expensive given the remote setting. It would also necessitate the removal of waste materials from the site,

which would require the waste by-products to be placed into the local land fill as no recycling is available.

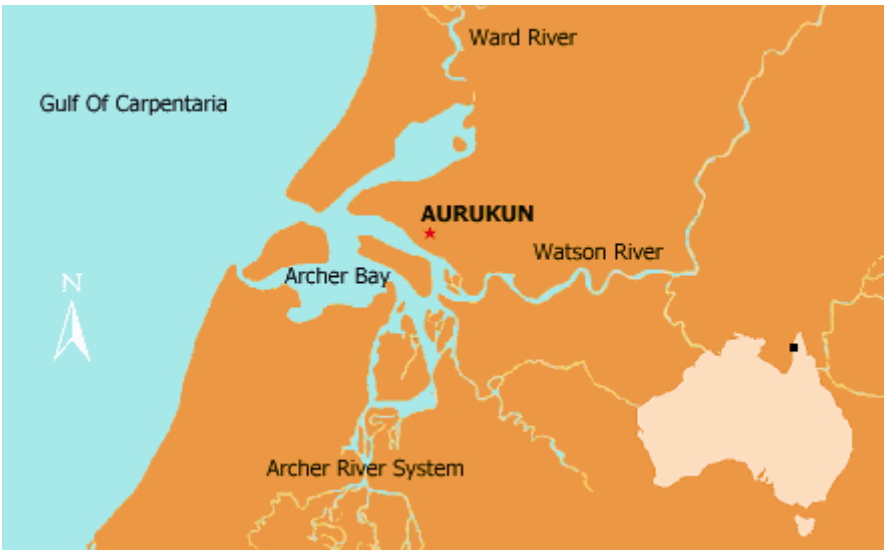

Fig. 1 Location of Aurukun in Cape York, Queensland, Australia.

The potential construction of a new building presented so many environmental problems, including energy inefficiencies and greenhouse gas emissions, in addition to high financial costs and logistical difficulties, that the project team decided alternative solutions had to be offered to the Federal Government and the Aurukun Council for consideration. The favoured alternative solution consisted of the refurbishment and reconstruction of the existing general store building. The project team posed whether the sustainable outcomes of reusing the building out-weighed the replacement concept originally suggested by the federal government through the local community. In developing the case for reusing the existing asset instead of rebuilding on another site, the team developed a schedule of interrelated social, environmental, and economic issues. Such issues explored included: comparative environmental impacts and efficiencies, including consideration of embodied energy within existing building structures; community perceptions of a new building versus refurbishment of a familiar building that had been part of the social fabric of the community for many years; skills development and community ownership; application of alternative and appropriate technologies; and the economic differences between constructing a new building compared to community-driven refurbishment. The project has moved past the planning and evaluation stages and the initial stages of refurbishment are currently underway.

Within the context of the foregoing background, this paper examines the various environmental, social, and economic issues involved in the Aurukun redevelopment project, with particular focus on environmental and social sustainability. Aspects of environmental management are considered as they apply to the processes of sustainable construction and development. The paper is written from the author's perspective as leader of the design and implementation of the project. This role includes having responsibility for: management of the overall project; creation of architectural specifications; consultations with government, Aurukun Council, and indigenous peoples; management of other professionals such as geotechnical experts and builders; formulation of green

building specifications and requirements; and inspection and handover of the project, which has a completion target date of November 2010.

2 Aurukun: Settlement History and Geography

Aurukun is a community in Western Cape York, Queensland, Australia, and lies 1000 km northwest of Cairns and 200 km south of Weipa on the Gulf of Carpentaria coast. It is situated in a Category 5 cyclone area, which can experience wind gusts in excess of 280 km/h. The drive from Cairns on dirt roads takes approximately 18 hours. During the wet season, December through to March, all roads are closed and Aurukun can be accessed only by plane or barge. The community includes a township and airport (Figure 2) and also covers 7,375 square km of land that includes 15 outstations which are occupied on a casual basis during the dry season. Aurukun community has approximately 1200 people who form the basis of traditional ownership for the area, comprising predominantly Wik (traditional owners) representing 17 aboriginal tribal nations. Wik Munkun is the first language of most Aurukun children, and English is the other dominant language of the area.

An examination of the history of settlement reveals that today's township lies on the site of the original Aurukun Mission, established in 1904 by the Presbyterian Church of Australia, which managed the reserve under the provisions of the 1897 Queensland Aboriginal Protection and Restriction of the Sale of Opium Act. Aboriginal (Indigenous) people were relocated from a large surrounding area, many against their will, to the mission settlement. In 1978, the Queensland Government decided to take control of both Aurukun and Mornington Island reserves; however, both communities protested and sought the help of the Federal Government. After lengthy negotiations, legislation for self-management of the two reserves was introduced into the Federal Parliament and the Aboriginal and Torres Strait Islanders (Queensland Reserves and Communities Self-Management) Act was passed on the 7th April 1978. On the same day, the Queensland Government revoked the two reserves which meant that neither the Queensland Act nor the new federal legislation applied to the area. Eventually, Queensland State and Federal Ministers agreed that local authorities would be created for the former reserves and the land leased to the newly created Aurukun Council for 50 years. On 22 May 1978 the Local Government (Aboriginal Lands) Act constituted the Aurukun Council and granted to it Aboriginal Land Lease No.1.

Fig. 2 Layout of Aurukun township and surrounds.

Aurukun is a pilot site for the Australian Government's Cape York Institute Welfare Reform project (instituted in 2007) and has been chosen as a 'model community' for government intervention through the Aurukun Local Partnership Project. Its major focus is to enable the community to take up opportunities arising from established mining activity and the proposed Aluminium Corporation of China (Chalco) bauxite mine in the area. It is anticipated that the Chalco mine will have a construction workforce of 700 people and an operational workforce of 100. The Aurukun Local Partnership Project is funded by State and Australian Government agencies.

Aurukun's community services include a health clinic, childhood centre, family support hub, women's shelter, and schooling to 16-year-old level. Law and order is provided by a police presence of 8 to 10 officers, a community justice group, and a Department of Corrective Services Parole and Probation service. Other services supported by the State Government include youth services, parenting education, childcare and family support programmes, public intoxication mitigation initiatives, school holiday activities, and local history projects.

3 Aurukun Business Centre

3.1 Background

The Federal Government, led by the Department of Families, Housing, Community Services and Indigenous Affairs (FaHCSIA), the Queensland Government, and the Cape York Institute (CYI), have embarked on a $48 million trial of new welfare arrangements for the Indigenous population in Cape York, including initiatives in health, employment, and economic participation. Aurukun is one of four communities involved in the trial.

Under the trial, Indigenous Business Australia (IBA) received a direct appropriation of $5.0m in 2007-8 for two components: (1) The construction of a business centre in Aurukun. This facility is intended to offer capacity for Indigenous businesses, including commercial/office accommodation and some retail space ($3m); and (2) The provision of business development support, mentoring, and loans ($2m), principally to Indigenous businesses in Aurukun but also to the other three trial communities, depending on need and capacity.

3.2 Projects

There are two main projects funded within the $3 million appropriation for the business centre component. The projects are:

(1) The redevelopment of the existing (and currently derelict) Aurukun general store building (Figures 3 and 4) into a commercial-business centre. Following discussions with relevant parties about their requirements, this facility is expected to provide office and other space for: several government departments, organisations, and businesses working in Aurukun, including Australia Post, Centrelink, Family Income Management, a bank, and up to four private businesses; meeting rooms for Aurukun Council and for local indigenous groups; and kitchen and toilet facilities. It will also provide a 'business incubator' facility for small Indigenous businesses.

(2) The expansion of the existing guest house facility through refurbishment of two existing dwellings adjacent to the existing eight-room guest house in Aurukun. This would enable each house to operate as a self-contained guest house, with the option of letting out each complete guest house for group accommodation, or letting out individual rooms within each house. This project would assist in the provision of accommodation in the town and would also provide a viable business opportunity. Work on this second project will depend on funds remaining after the general store redevelopment.

At this stage, IBA's priority has been on the first project—redevelopment of the general store building. The redevelopment of the old store is expected to use the bulk of the $3m construction funds available. To date, several phases of this project have been completed. These include initial consultations with government and indigenous people, site evaluation including geotechnical and geochemical investigations, formulation of a detailed plan for the redevelopment of the old store, and initial clear-up of the site. Refurbishment is now underway.

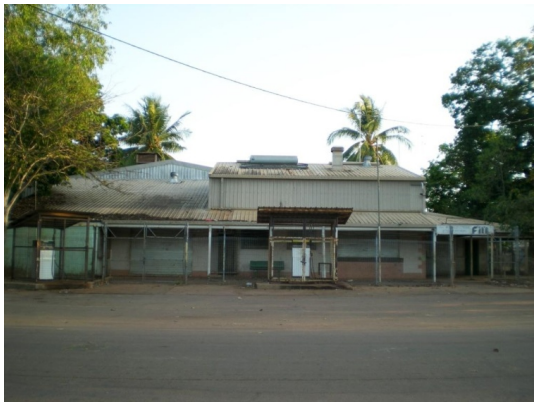

Fig. 3 Aurukun community general store (front view) prior to refurbishment.

Fig. 4 Aurukun community general store (back view) prior to refurbishment.

3.3 Redevelopment of the General Store Building

3.3.1 Initial Evaluation

Evaluation of the building shows that it is structurally sound, with the steel structure being intact and no great amount of deterioration or damage evident. The internal and external walls are masonry, built from concrete blocks, and the floor is concrete slab in good condition. The major problems as identified included: (1) Fuel bowsers (pumps) and storage tanks, located at front of the building, need to be removed. (2) Unwanted fixtures in the building, including the cool rooms and freezer units, an old display cooler, old furniture, and other items, need to be removed. (3) There are several safety issues, including: the core of the building is extremely dark with no outside light source; the electrical system is extremely dangerous with live wires exposed and connections left hanging; and the outside ground areas around the bowsers and at the back of the lot are heavily contaminated with petroleum products. (4) There is a possible leaking roof as the store was built in two components with separate roof structures. (5) The facia and façade require work. (6) Once the air conditioning units and venting are removed, large holes will need to be repaired. (7) The outside ground level is too high and contravenes the local building code.

3.3.2 Refurbishment

The initial stages of work and anticipated aspects of refurbishment included: (1) FaHCSIA engaged a firm to oversee the clean-up and other activities, including: remove rubbish to local tip; remove and test refrigeration and freezer units for possible reuse by other businesses; and steam-clean interior of building. (2) FaHCSIA engaged a local geotechnical consultant from Weipa or Cairns to core the samples required to determine if the fuel tanks had any leakage and therefore any contamination to be considered before refuelling the tanks or removing the tanks from the ground. (3) Cleaning the inside of the building so that refurbishment could begin. (5) Reconstruction is underway after the end of the wet season in April 2010. The refurbishment includes: a completely new roofing system, light wells, a new wiring harness, internal wall reconfiguration, and elements of passive design for thermal and energy efficiency, such as insulation.

3.3.3 Environmental Hazards

Environmental and health hazards can arise on a construction site from several sources, including: substances removed from the existing site; activities taking place on site; substances brought to the site; and substances created on site. Substances removed from a site have potential to cause environmental problems. Such a problem has arisen in the refurbishment of the old general store in Aurukun. Built in the late 1970s as the general store for the local community, it was abandoned in 2005 when a new store was constructed across the road, and the old store was left with various items remaining as new items replaced the existing stock. These items included refrigeration and freezer units of various dimensions, air conditioner units of various sizes and ages, asbestos lining materials, and petrol and diesel bowsers and tanks underground. All these items have the potential to pollute the environment and have to be treated with care so as not to produce health hazards for the local indigenous community and contaminate their water and food supplies.

In order to assess the hazards involved in the refurbishment of the old general store into the new centre, a geotechnical engineer and an environmental specialist were engaged to assess the materials and equipment left on site. The major concern involved the fuel tanks. It was first decided that core samples needed to taken beside the tanks to determine whether they had been leaking. Up until two years ago, the petrol tanks were filled with petrol containing lead, and there was a concern that these may have leaked. Samples were taken and analysed, and it was determined that the tanks had not been leaking. Two options were then considered suitable for the tanks, which were either to abandon the tanks and backfill, or to remove the tanks and dispose of them. Initially considerations suggested that the abandon tank option was favoured; however, as there are no concrete batching plants, concrete agitators, or concrete pumps available in the area, the equipment would have had to be floated into the community over dirt roads at considerable financial and environmental cost. The tank removal option posed the question of how to dispose of the tanks. They could be reconditioned, but would have needed to have been floated out of the community and sent more than 1000 kilometres to achieve this outcome. Another possibility for this option, and the one finally chosen, was to remove the tanks, decontaminate them, and then place them in the local land fill. Although this may not have been the ideal option, it was the best for the circumstances and constraints, including transportation issues and limited financial budgets. Such decision-making highlights the difficulties of working in remote communities, and in making decisions that will be positive both for the community and for the environment.

4 Aspects of Environmental Management and Sustainability

4.1 Environmental Management System

The adoption of an environmental management system (EMS) for the refurbished Aurukun general store has the potential to enhance the relationship between the economic and environmental performances of the building. Some of the steps taken to improve and meet standards being developed by using the Green Buildings Scheme [3] and Environmental Management Systems are as follows: the issuing of a bottom line report; a commitment to the reduction of greenhouses gases; an assessment of environment impacts, setting targets to reduce these impacts, and planning how to achieve the targets; and the training of new and existing employees concerning environmental issues, in order to maximize the

efficient use of resources, reduce waste, and decrease spending through more efficient operation of the refurbished building. All of these various initiatives will result in a number of outcomes, including lower electric and water utility costs through environmentally effective use of building materials, enhanced health and productivity, long-term economic returns, and reduced environmental impacts (e.g. [4]).

The Aurukun Council will deliver feedback and suggestions to improve practices relating to energy efficiency, water consumption, waste reduction, and general environmental responsibilities. How the community will manage its potential impacts on the environment and on the health and welfare of people depend on the implementation of the practices and procedures described. When these are fully implemented, the Aurukun Council has the potential to move a facility beyond compliance with environmental regulations toward a dynamic, continual process of operational and organizational redesign, with the objective of further reducing the facility's adverse impacts on the environment. By adopting a high-quality EMS, it is likely that the facility will discover many opportunities to reduce wasteful uses of resources, thus saving money while improving the environment.

4.2 Environmental Performance of Construction Materials

In recent years, the concept of sustainable buildings has drawn much attention from both scholars and building professionals [5]. Although the notion of sustainability is complex, much of the discussion and analysis continues to surround energy consumption and CO_2 emissions involved in the life cycle of buildings [6]. The resources consumed and pollutants emitted can be assessed with respect to three main parts of the building life cycle: production of the building materials and actual construction; operation of the building and maintenance during its life; and recycling/disposal of materials at the end.

Because embodied energy represents a significant component of the life cycle energy associated with buildings [7], many studies have been made regarding the embodied energy and carbon of a wide range of construction materials. Energy and carbon values are reported in many commercial and several scientific databases and inventories, an example being the Inventory of Carbon and Energy (ICE) database of the University of Bath (UK), which contains data (selected from peer-reviewed studies) for over two hundred different materials [7]. However, life cycle analysis (LCA) of built assets with respect to embodied energy and carbon is made difficult by significant data variation arising from various issues including differences in measurement methodologies, in boundary definitions (inclusions and exclusions), and in energy source assumptions [6], [7]. Notwithstanding such overall data variations, there is some consistency in the differences between various construction materials and construction systems in terms of embodied energy and carbon.

If a new building at Aurukun had been constructed, instead of refurbishing the existing one, the embodied energies involved in the construction materials used (Table 1) would have been large, totalling 1,420,850 MJ. The values in Table 1 refer to "cradle to gate" conditions, i.e., the values do not include the energy involved in transporting the materials from the production site to the construction site, which, in the case of Aurukun, would be large due to the vast distances from the material manufacturing centres.

Tab. 1 Table 1: Calculated embodied energy values for construction materials assuming the business centre had been newly built rather than refurbished.

Item	Calculation of Embodied Energy
Concrete Blocks	Blockwork for walls: area 960 m^2, 12,500 blocks, 12.5 MJ/kg per block [8] = 156,250 MJ.
Concrete Floor Slab and Footings	125 m^3 of concrete required: 2732 MJ/m^3 for pump mix concrete [8] = 341,500 MJ.
Steel	8.1 tonnes reinforcing steel in concrete slab and footings: Rod steel 36.4 MJ/kg [8] = 298,840 MJ. 3.5 tonnes (as cyclone ties in concrete blockwork): Rod steel 36.4 MJ/kg [8] = 127,400 MJ. 6.0 tonnes in building framework: Bar steel 36.4 MJ/kg [8] = 218,400 MJ. 7.1 tonnes for steel roof (area 1,130 m^2, sheet thickness 0.8mm, density 7.9 kg/m^3): Sheet steel 39 MJ/kg [8] = 278,460 MJ.

4.3 Operational Carbon Neutrality and Energy Efficiency

At Aurukun, the goal set was to do as much as possible regarding carbon and energy efficiency issues, bearing in mind the location and challenges of the project in a remote part of Australia.. The challenge has been set for the construction industry as a whole to take a closer look at how buildings can be made carbon neutral by 2020 [10]. Buildings need to have zero emissions in their construction, operation, and embodied energy to be truly carbon neutral. Although it is possible in both theory and practice to achieve zero net operational carbon emissions from buildings by 2020, truly carbon neutral buildings represent a significant challenge.

Regarding the environmental impacts of a building arising from its operation and maintenance, the refurbished building in Aurukun will not be able to achieve zero net operating emissions. However, the project team applied some basic concepts, as outlined in the remainder of this section, in order to improve operating efficiencies. First, it was realised that all the employees will almost never be in the offices in the refurbished building at the same time, because many government and other agencies will co-share the offices within the building. Hence, it was unnecessary to provide office space for all staff. This initiative has reduced the size of the development, which in turn has reduced projected energy demand, as well as the amount of materials used.

Second, concepts and elements of passive design were applied to the planned refurbishment of the building. Passive design refers to the use of simple design techniques that assist in controlling ventilation and the temperature of a building, without the use of any mechanical systems [10]. This can be achieved through: (1) Proper site orientation, by ensuring that the occupied areas are facing north while locating all services to the south, east, or west. (2) Installing adequately-sized, properly-shaded operable windows to the north, while minimizing the glazing extent to the east and the west. Shading devices must be designed to permit solar access in winter, but to block it in the summer given the high temperatures typical of the area. (3) Using the right insulation for the right climatic conditions will ensure that the building's internal temperature stays at a comfortable level. Depending on the climatic conditions, the amount, type, and location of insulation will change. The general store building in Aurukun is already correctly positioned for climate, so the project team adopted an approach that included shading and allowing natural light into the building, as well as insulating, to make the building as solar-passive as possible.

Third, regarding energy-efficient appliances and light fittings, appliances in offices and homes in Australia are assessed under the Energy Star rating system [12].This is an international standard for office equipment including computers, printers, and photocopiers. Specifying appliances that are labelled with Energy Star ensures that energy efficient appliances are installed. The project team identified the following energy-efficient implementations for the refurbished building: (1) Solar hot water collectors will be mounted on the north-facing roof of the building to produce hot water to be used in the building. (2) A DALI (Distributed Control, Local Intelligence) light control system will be installed. This intelligent control system is an automatic time scheduling system, where the lights are automatically switched off or dimmed according to natural light and occupancy hours. Another example is individually controlled workspace lights, where only the workspaces that are occupied are lit at appropriate levels. (3) Efficient light fittings in combination with the DALI control system will significantly decrease the energy consumption associated with lighting in buildings. The traditional light bulb can be replaced by efficient fluorescent lights, or by even more efficient LED lights. (4) The project team is considering purchasing green power (this has not been achieved to date, but one company is looking at providing solar power during the day hours and running on normal diesel power at night). (5) Optimising, upgrading, or removing Heating Ventilation Air Conditioning (HVAC) systems. An energy initiative that has been implemented in the Aurukun project is to remove the existing inefficient HVAC systems and replace them with innovative, energy-efficient solutions. (6) Transportation of building materials. Building products have to be transported from their point of origin (Sydney or Melbourne, more than 3000 km away) to the construction site at Aurukun. The energy used for this activity is generally included in the embodied energy of products. This energy, while small compared to the energy used in the manufacture of the product, can be reduced by: (a) Changing the mode of transportation, e.g. using train or ship freight rather than trucks; (b) Using a fuel source with less environmental impact for transporting materials, e.g. hybrid vehicles or LPG; (c) Smart route planning, where trips to several destinations in close proximity to each other are combined. It is with these points in mind that the refurbishment of the existing building saved on considerable amounts of transport to the site compared to constructing a new building.

4.4 Sustainability in the Australian Construction Industry

The property industry in Australia defines sustainable development in terms of those who produce, develop, plan, design, build, alter, or maintain the built environment, and this includes building materials manufacturers and suppliers as well as clients and end-use occupiers. The building/property industry in Australia is well placed to deliver significant long-term environmental improvements using a broad range of measures, and is unique in that it can influence and create behavioural changes at all stages of the supply chain. With regard to delivering such improvements, the Green Building Council of Australia (GBCA) [13] was set up in 2002 to promote sustainable development and the transition of the property industry by supporting green building programs, technologies, design practices, and operations. The property industry is endeavouring to balance environmental, social, and economic issues in order to ensure a viable and valuable industry for future generations.

The GBCA however identifies a number of barriers to the mainstream uptake of green building principles and practices, including: a lack of green building knowledge; too

much value placed on short term construction costs compared with long term benefits; uncoordinated regulations; a lack of green/reusable materials; and confusion concerning building environmental rating tools. In response, the GBCA have identified the following actions to advance green design and building in commercial developments: establish consistent standards and targets for the building industry; undertake green building educational programmes; encourage government leadership and government-industry partnerships; and provide financial incentives/concessions to increase the use of green building technologies.

As buildings account for one-sixth of the world's fresh water withdrawals, one-quarter of its wood harvest, and two-fifths of its material and energy flows [14], building green is presents an opportunity to use resources efficiently while creating healthier buildings that improve occupant health and well-being. However, in remote parts of Australia, occupant health and well-being are not considered to be such high priorities as they are in the major cities, and the primary emphasis is placed upon the dollar figure of construction or refurbishment. Because the major urban areas are the centre of attention for building green, the construction and property industry needs to be careful that it does not become too focused on the green aspects of sustainability, to the possible detriment of social and economic factors. This is particularly the case when considering poorer, more remote communities, for which it is essential to achieve an appropriate balance between green (environmental) issues and the social and economic needs of communities.

With this in mind, it was the aim of the project team to accomplish as many positive outcomes as possible, but not to transfer costs or impair the social development of the local Aurukun community. Other sites for (re)development should be merited on their social and economic benefits in addition to environmental considerations. For example, the creation of jobs, directly or indirectly, is a key factor for local communities and this should be given equal weighting to the “green-ness” of the building itself. Although the environment is obviously of high concern, it is also important that other factors are taken into account when government money is concerned. An overemphasis on environmental targets could, in some cases, jeopardise the ability of new developments to form a sustainable part of local economies in remote regions.

5 Closing Remarks

In remote localities within Australia, such as Aurukun, it is clear that economic progress has often come at the expense of our diverse human communities and natural resources. The challenge of extending an equitable and high-quality life to all Australia’s inhabitants remains unmet. Meanwhile, disappearing species, eroding soils, vanishing forests, and changing climate are among the phenomena that mean we must transform our way of living so that we can continue to prosper while remaining within nature’s limits.

The findings presented here, concerning the refurbishment of an existing building into a business centre in preference to constructing a new building, highlight the imperative of initiating significant changes now if the quality of life in Aurukun is to improve, not diminish, over the next generation. The redevelopment of the old general store will provide the training areas, government services, and small retail shops that will help to bring about the required goals of this project. Following a sustainable path to the future within Aurukun has the potential to protect the natural wealth, strengthen the social fabric, revitalise the community, and place the economy on a firm and enduring foundation.

A growing body of data indicates that continuing along a path designed only to prosper economically will increasingly threaten our health and diminish the quality of life we seek to maintain, until it becomes untenable. Enduring economic success cannot be purchased at the price of declining natural wealth and increasing social disparities. Aurukun has the potential to reconcile human aspirations with emerging ecological imperatives by fostering a sustainable society. The findings from the Aurukun project indicate that there are solutions to the problem of sustainable development, and I remain fundamentally optimistic for successful outcomes within both Aurukun and Australia.

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