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*“Lessons for Sustainability from the World’s Most
Sustainable Culture”*

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Lessons for Sustainability from the World's Most Sustainable Culture

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Abstract

Sustainable development is one of the key challenges faced by societies today. Yet it is not a new challenge; throughout history, societies have faced the need to live within environmental constraints. Some have done so well, and some poorly. One society which did well for tens of thousands of years is that of Aboriginal Australia. This paper explores some lessons from Aboriginal Australia which have resonance in the modern world and shows that countries which have learned those lessons are in fact more sustainable than those which have not. It thus suggests that there is much that the pantheon of human experience can teach the modern world as it endeavours to create a sustainable future.

Lessons for Sustainability from the World's Most Sustainable Culture

1. Introduction

The notion of sustainable development, defined by the *Brundtland Commission* (WCED, 1987) as growth which met the needs of the present without compromising the ability of future generations to meet their own needs, has risen rapidly in the public consciousness and generated significant academic debate. One part of the debate is a discourse on societies which have successfully managed their environmental resources over a long period of time; societies that have been sustainable. This paper explores the society of Aboriginal Australia prior to white settlement and the lessons which it contains for the modern world.

Section Two of the paper outlines some of the literature on societies which have been sustainable, with a brief discussion of sustainability in Aboriginal society. Section Three discusses Aboriginal society in greater detail, outlining the aspects which made it sustainable. Section Four draws some important lessons from this experience and then explores the extent to which modern nations exhibit similar tendencies, and the effect this has had on their own sustainability. Section Five concludes with some thoughts about how societies like that of Aboriginal Australia can provide lessons for the modern world.

2. Sustainability and Socio-Economic Systems

The literature on sustainable development is very large (see Norton & Noonan, 2007, for an account of the evolution of the discipline). This paper focuses on a small part of the literature which explores lessons that can be learned from societies which have been successful at sustainably managing their resources in the past.

Much of the literature on sustainable societies focuses on how a particular society has managed a particular resource; Xu (2006) focuses on traditional Chinese agriculture Ostri (2005) focuses on traditional Nepalese water management techniques and Dalle, Isselstein & Maas (2006)

focus on the traditional knowledge of Ethiopian pastoralists about local resources.¹ More broadly, there is the common pool resources (CPR) literature. Martin (1989) categorises thousands of case studies and Ostrom (1990) develops a set of good governance principles based upon the literature.

Another strand of the literature looks more broadly at what has made societies succeed or, more often, fail in the context of environmental management. Diamond (2005) is perhaps the best known, particularly amongst non-specialists, and he suggests that societies fail because of combinations of environmental damage the societies themselves cause, attack from or too little contact with other societies, climate change and the inability of the society to deal with these pressures. Societal response to external pressures is a key issue in the society's sustainability. O'Sullivan (2008) explores the links between agricultural surplus and the stratification and specialisation of a society, suggesting that both can leave societal elites disconnected with the ecosystems that support it and unable to make long-term decisions necessary to prevent their collapse. He cites as evidence a number of civilisations in South America and proposes that the modern world, if it is not to suffer a similar fate, ought to focus on devolving both management of ecosystems and production of resources to a more local level. Glasby (2002) suggests that efficient production of necessities by modern societies leaves them with surplus labour, which is then employed to produce wasteful luxuries in order to maintain full employment. He suggests that a little less efficiency in production might improve sustainability. Harada & Glasby (2000) suggest that the right level of efficiency and societal complexity to maintain sustainability is that exhibited by Tokugawa Japan. The authors do not suggest what should happen to the additional people which Tokugawa Japan could not feed but modern Japan can, but Glasby (2002) advocates a global one-child policy, enacted over the course of a century, to bring population levels down to the billion or so people that he believes the planet can support sustainably.

Both O'Sullivan (2008) and Glasby (2002) provide illustrations of how the experience of Aboriginal Australia might inform the sustainability debate. Aborigines were great traders, trading small, valuable items across the continent and travelling long distances themselves in order to obtain food from related kin groups. Moreover, as we shall see below, it was precisely through not localising production that they were able to increase the sustainable carrying capacity of the land. The Aborigines were also, given their level of technology, highly efficient at food production and preparation, activities which took between two and five hours per day to complete (Sveiby, 2009).

¹ The comparison between indigenous and modern scientific knowledge about a resource is an area of study with a growing

They did not, however, devote their surplus labour to the production of luxuries, but rather used it to produce intangible goods requiring few physical inputs such as information, education, entertainment and ritual (ibid). Thus, localised production is not necessary for sustainability and nor is efficient production necessarily its nemesis. It remains to ask what else Aboriginal Australia might teach us, but first it is useful to explore the Aboriginal concept of sustainability further.

2.1 Sustainability and Australian Aboriginals

Australia's Aborigines maintained its landscape sustainably for tens of thousands of years prior to white settlement and, whilst changes did occur, the landscape appears to have been stable for many thousands of years (Russell-Smith, Yates, Edwards, Allen, Cook, Cooke, Craig, Heath & Smith, 2003). This arguably makes them the most sustainable society on earth. Aboriginal people refer to the maintenance of their environment as "caring for country", and the main tool used is "fire-stick farming" (Jones, 1969); controlled burning to encourage re-growth. Caring for country is critically important to Aboriginal people because of its spiritual dimension. The main Aboriginal creation belief of the Dreaming emphasises the joint creation of the landscape, its fauna and its people, making all three kin and Aboriginal people reticent about altering ecosystems. This does not mean, however, that Aboriginal people think about sustainability in the same way as the academic literature views it today. Caughley, Bomford & McNee (1996) note that the Aboriginal concept of sustainability involves the maintenance of resources at a subsistence level. This is somewhat different from more modern concepts like strong and weak sustainability (see McDonald, 2006 or Ropke, 2005), in that it does not focus on the maximisation of the productivity of the land, either for ecosystem services or for (current or future) human needs.

This paper focuses on Aboriginal society prior to white settlement, when they managed the whole landscape. However, the benefits of Aboriginal caring for country do not lie in the distant past. Altman & Whitehead (2003) note that areas managed by Aboriginal people in the traditional manner today have greater biodiversity than otherwise similar areas. Altman, Buchanan & Larsen (2007) suggest that land with fewer Aboriginal people living on it suffers more from incursions of feral species and intense bushfires. Caring for country is thus an ongoing activity. It remains to explore in more detail the workings of Aboriginal society prior to white settlement, and the factors which made it so sustainable. This is the task of the following section.

literature, see Ghimire, McKey & Aumeeruddy-Thomas (2004) or Donovan & Puri (2004) for two examples.

3. Aboriginal Society and Sustainable Resource Governance

Aboriginal Australia's commitment to sustainable management of its resources was borne of necessity. A hunter-gatherer society living in an often harsh environment, the Aborigines would have perished if they had not become adept resource managers. Far from perishing, they prospered, using highly sophisticated systems of resource governance to do so. Whilst these differed across the country, it is possible to speak of Aboriginal resource management in terms of a few stylised facts:

- Land is divided into relatively small plots, and inalienable rights to these plots are held by a relatively small group, usually an extended family. The rights and responsibilities of each member of the group in relation to that land depends upon their status. The notion of an individual "owner" is less relevant than it is in Western thinking.²
- Associated with each plot of land are a number of sacred sites, which embody the spiritual aspects of the land, and form the constitution of Aboriginal law (Coombes, Brandl and Snowdon, 1983). Associated with each sacred site is a totem and specific knowledge pertaining to the appropriate maintenance of that land. Sacred sites are usually associated with hunting bans and other rules which prevent over-exploitation of the resource which is their totem.
- Practical and spiritual knowledge are intertwined, and the appropriate people on each plot of land will possess and use both sets of knowledge without differentiating between each.
- Knowledge about a plot of land and its sacred sites is itself sacred, and each generation of responsible people must go through an initiation process to learn it. Elders, who possess this knowledge, are respected because of it, and deferred to in decision-making. They also have an obligation to share knowledge to ensure that future generations know how to manage their country. Elders can, however, generally decide to whom they reveal what information, allowing a degree of flexibility which ensures that information is passed to the person who will use it to the greatest benefit of the community in the future.
- No plot of land is sufficient to support its inhabitants all of the time. However, each has some resource which is likely to be in surplus some of the time, and hence available for sharing with outsiders on a reciprocal basis.

- Possession is defined rather differently than in the modern West. For Aborigines, it is the right to be asked before use, rather than the right to exclude from use. Social ties are created through resource-sharing and the obligations for reciprocity this creates enhances the social status of those in a position to share their resources. Material goods, apart from their immediate value in use (a digging-stick used for digging, for example) are valued for their ability to create obligations and social ties, rather than from any value they might create for their owner by being withheld from others.
- Access rights to land are gradated, according to one's level of knowledge about a particular plot of land. Aborigines consider themselves "home" when they need defer to no-one about their knowledge and management of a plot of land.
- Ties between people are based upon kinship, which is tied to the land of one's birth; one is who one is because of where one was born and where all of the people one is related to were born (Rose, 1998). Kinship ties are much more complex than a modern, Western, nuclear family,³ because they define the resources to which one can obtain access outside one's own home plot.

These stylised facts give rise to a complex, interconnected system. Since plots of land are too small to support their inhabitants in all seasons, people must travel and share resources. This is reinforced by a strong social norm favouring reciprocity as a means of improving social status. However, unrestricted resource sharing is difficult to police and likely to lead to resource degradation. Thus, kinship ties form the basis of what Ostrom (1990) refers to as the "lattice of interdependence"; a common, necessary ingredient in resource governance, which determines who shares with whom. However, kinship ties are inflexible. Hence, whilst such ties determine who one may share with, they do not determine who one will actually share with; they need to be actualised by the person in question being initiated into the country and spiritual lore of his tied kin. This provides a mechanism by which those with primary responsibility for a particular piece of country can ensure that optimal sharing takes place. These primary responsibility holders are elders, who have had the greatest length of time to develop an understanding of their land. To ensure that elders act responsibly, their obligations are intertwined with spiritual beliefs, meaning that failure to perform correctly carries maximum censure.

² The Pintupi word is *walytja*, a word which literally means "one's own", and can refer equally to tools, family or even oneself. Its antonym is *yapunta*, which literally means "orphaned" (Myers, 1982). These terms provide a rather neat illustration of how Aboriginal people view property.

The relatively small plots of land which form the lynch-pin of the system were borne of necessity. Climactic variation in Australia is such that a plot of land large enough to support a family grouping throughout the seasons is so large in much of the country that family groups would meet too infrequently to sustain the society. Large plots also waste seasonal surpluses for want of sufficient people to consume them. Smaller plots, able to support a family group most of the time and greater numbers of people when their seasonal resources are in surplus, coupled with a right to forage in the lands of others, actually increased the (human) carrying capacity of the land. They also improve sustainable management of the land; with many people passing over one's land, insufficient caring for country is soon discovered. The difficulty introduced, the need to keep track of more users of resources, is managed by requiring all outsiders to seek permission before consuming any resources (upon pain of death) and by making boundaries difficult to ascertain by basing them on local knowledge (the Dreaming tracks of the local totem) rather than obvious topographical features. This latter aspect makes it difficult for an outsider to ascertain just whose land he is on, and hence makes him cautious about consuming resources without permission (Altman and Peterson, 1988, Williams, 1982).

Religion is the glue which holds the system together. Not only does it enhance the importance of sustainable resource management, but, in a pre-literate society, it was an effective way of making sure that crucial information on how to care for country was passed down from generation to generation. Using religion in this way is a common approach where literacy is low, and can be used to transmit highly technical information; Bronowski (1973) shows how monks in Japan used it to preserve highly sophisticated sword-making techniques.

The *Brundtland Report* (WCED, 1987), and indeed many academic authors and most of the policy debate, focuses on the role of government in supporting sustainable development and the need to develop consistent, often globally consistent, approaches to support sustainability. Government is seen as essential to prevent individual economic actors from precipitating tragedies of the commons (Hardin, 1968), and consistency is seen as necessary to ensure that the same tragedies do not occur at a regional or national level by state or national governments seeking short-run advantage at the expense of long-run sustainability. The Kyoto Protocol is one example of this policy process in action at the global level, and highlights the way in which decision-making about sustainability can become highly centralised, either at the national level or, in the

³ See Berndt & Berndt (1964) for a detailed taxonomy.

case of Kyoto, by national governments negotiating on behalf of their citizens in an international forum. However, Aboriginal society had neither an over-arching state nor political centralisation of decision-making in regards to sustainability. Instead, it was characterised by polycentric power structures, where responsibility was devolved to the local level and censure was provided largely by moral (indeed, religious) suasion, rather than the policing activities of a state. Thus, whilst one might use governments and centralised decision making based around agreed consistent approaches (either at the national or international level) to support sustainability, the Aboriginal experience shows that one does not have to.

Aboriginal people are not unique in their land management practices. Indeed, theirs is a relatively common response to the environmental circumstances they faced. Perevolotsky (1987) notes similar practices amongst the Bedouin in Arabia, which he calls “reciprocal altruism”, and suggests it occurs when regional variation in the probability of good resources being available in any given season is high, and the costs of excluding others from one’s own resources in times of plenty are greater than the benefits of having local forage available entirely for one’s own use. In a modern context, McAllister, Gordon, Janussen and Abel (2006) outline the agistment practices of modern graziers in Queensland where cattle are grazed on their own lands most of the time, but graziers make use of networks of trust to find pasture when their own lands are drought-affected. This replicates the governance model of the land’s original Aboriginal inhabitants and McAllister et al (2006) show that it is in fact more efficient than government drought relief programmes which provide cash to affected farmers. The findings of Perevolotsky (1987) suggest that one might find many societies which have developed similar approaches to those used by Aborigines, whilst those of McAllister et al (2006) suggest that these approaches can be incorporated by the modern world to aid sustainability in certain contexts. It remains to examine whether this has in fact happened; whether those countries which display aspects similar to those discussed here are in fact more sustainable. This is the task of the following section.

4. Lessons and Broader Evidence

From the Aboriginal experience, one might distil the following five aspects which underpin the sustainability of Aboriginal society:

- Diffuse power of control over resources.
- Reciprocity.

- Relative equality in, and indeed limited importance placed upon material wealth.
- No overarching state.
- Deep, spiritual commitment to sustainable resource governance.

These aspects are not unique to Aboriginal society. As mentioned above, the construct and operational rules of Aboriginal society bear strong resemblance to those of other societies operating in similar environments. Moreover, the five aspects listed here are rather similar to Ostrom's (1990) seven principles for successful CPR governance. This suggests, perhaps, that sustainability principles are not society-specific, but present in various societal contexts. In turn, this begs the question of whether societies that today exhibit the above aspects tend to be more sustainable than those which do not.

In order to explore this further, I make use of the Quality of Government database (QoG) (Teorell, Holmberg & Rothstein, 2008). The QoG is collected from a variety of sources of international comparative data, and is designed to promote an understanding of which countries possess and how countries improve quality of governance. Data include economic, political and social variables. I have used the cross-sectional form of the database, which contains data from 2002, or the year nearest to it, as reported by the country concerned. Below, in the description of the data, I provide the original source for each of the variables used, but all (with one exception, detailed below) were sourced from the QoG.

Choosing the right variables is a difficult and somewhat subjective task. For most of the five attributes outlined above, I choose two indices, to ascertain whether each gives similar effects. Although hardly foolproof, this gives some indication of whether the measured effect is real or is merely an artefact of the construction of the relevant explanatory variable. Another difficulty is coverage. The QoG covers many studies and not all of these examine the same set of countries, meaning that combining data results in lost observations. Ideally, I would like to include as many countries as I can in the analysis. Thus, rather than examine one model, I examine three, with one model extended to capture an additional characteristic. The first of these includes political power and wealth variables, for which I have the largest number of observations (132 countries). The second includes these variables plus a variable indicating the size of government, and contains 92 countries. The third includes measures of religiosity and reciprocity, and contains only 50 countries. In general, it is the richer countries which are included in more studies in the QoG, and thus Models Two and Three are more reflective of wealthier nations. Although not perfect, my

approach is one way of trading off maximising the number of explanatory variables, and maximising the number of observations.

To measure sustainability, I use the Environmental Sustainability Index produced by the Environmental Performance Measurement Project (<http://www.yale.edu/esi/>). This is by no means the only measure of sustainability; Boringher & Jochem (2007) assess eleven different indices, including the ESI (favouring none). However, the ESI does offer a relatively broad coverage of countries and aspects of sustainability. These aspects include the nature of environmental systems in a country, the degree to which those systems are stressed, how vulnerable the people of the country are to environmental stress, their capacity to respond to environmental challenges and their degree of global stewardship.

To measure polycentricity, or the spread of political power, I have chosen Coppedge & Reinicke's (1990) index of polyarchy (<http://www.nd.edu/~mcoppedg/crd/datacrd.htm>) and the Economist Intelligence Unit's Index of democracy (<http://www.eiu.com/>). The former is denoted POLY in the models below and decreases as polycentricity increases, and the latter is denoted EIUD and increases with polycentricity. Each measures the degree of democratic participation, the fairness of elections, and broader measures of freedom of expression and civil liberties. None quite captures polycentricity in the sense of traditional Aboriginal society, but each is perhaps as close as one can get with modern data.

To examine the importance of government, I use World Bank data on government expenditure as a proportion of overall GDP (<http://go.worldbank.org/ZSQKYFU6J0>), denoted GOV in the models below. This represents quantity, rather than quality of government, and I explore the latter issue in an extension to Model Two below.

To measure the spread of income, I use Gini Coefficients. To measure income itself, I use the log of GDP and per capita GDP, converted to purchasing power parity terms. These are denoted GINI, LGDP and LPCP respectively in the models below. A distribution of wealth is not simply a distribution of income, but also includes how assets are distributed. Thus, I complement the Gini Coefficient measure with Vanhanen's (2003) measure of the distribution of economic resources (<http://www.fsd.uta.fi/english/data/catalogue/FSD1216/meF1216e.html>). This is a combination of the author's measures of the prevalence of family farms in agriculture, and of the decentralisation of non-farm resources. It is denoted by PWR in the models below.

Assessing the impacts of spiritual beliefs and social norms of reciprocity like those of the Aborigines is much more difficult than the other aspects of Aboriginal culture assessed here. This is because religious beliefs and reciprocity are difficult to quantify in a meaningful way which captures both the strength and nature of these characteristics. The closest variable within the QoG to Aboriginal spirituality is a measure from the World Values Survey (<http://webapp.icpsr.umich.edu/cocoon/ICPSR-STUDY/03975.xml>) on the strength of religious devotion (REL in the models below). This measures quantity not quality, and gives no indication of whether the stated religious belief supports sustainability or not. For reciprocity, there is no measure within the database, but the World Values Survey does measure the degree to which respondents feel they can trust those around them (TRUST in the models below). Since trust is generally a precursor to reciprocity, I use it here as a proxy for reciprocity. Both the measures of spirituality and reciprocity are rather crude, and should be interpreted as such in the models below.

Not every nation is equally endowed in its resources. As Diamond (1998) points out, geography can favour some nations over others and thus play an important role in determining its development. Nations with a larger environmental endowment might be expected to be more sustainable. This is not because they are necessarily more conservative in their resource use (indeed, the opposite may be true), but rather because, for a given level of economic activity, a nation with a larger environmental endowment will influence its environment less than a nation operating with a smaller environmental capital stock. In an endeavour to account for this fixed effect, I examine the notion of the bio-capacity of a nation (BCAP in the models below), essentially its environmental capital, estimated by Ewing, Goldfinger, Wackernagel, Stechbart, Rizk, Reed & Kitzes (2008), in their study of ecological footprints. The bio-capacity data are the only data which are not sourced from the QoG.

The results of the three models are presented below in Tables One, Two and Three. Since I have, in most cases, paired variables, there is an issue of multicollinearity if one includes, say, both POLY and EIUD in the same regression. For this reason, in the models below, only one of each pair is included, generally the one which provides the strongest results.⁴ In each model, tests indicate the presence of heteroscedasticity, and thus White's (1980) heteroscedastic-consistent covariance matrix was used. The averages and standard deviations of each variable are shown to provide some indication of how the sample changes with each model.

⁴ A full set of results is available from the author upon request.

Tables One, Two and Three about here.

The models provide some interesting results. The R^2 results show that the models each explain a little over half of the variation in sustainability. There are thus likely to be a number of omitted variables.⁵ This is not surprising, given the complex nature of the sustainability concept. It is perhaps surprising that such simple models are able to explain as much as they do.

The first obvious finding is that political decentralisation is important for supporting sustainability. Moreover, the size of the impacts (taking into account their opposite scales) is roughly the same in all three models.⁶ This suggests that centralised decision-making is in fact less likely to produce a more sustainable society than polycentric decision-making. The finding echoes both the Aboriginal experience and the findings of other authors such as Ostrom (1990) and O'Sullivan (2008), but not the recommendations of the *Brundtland Report*, nor the direction which modern public policy often takes in regards to sustainability. In contrast to equality of political power, equality of economic power does not appear to be essential to supporting sustainability. This aspect of the Aboriginal experience is not translated to the wider context and may be the case because, with an overarching state, political power can be used to mitigate economic power.

Overall, larger national wealth does not appear to be associated with increased sustainability; LGDP is negative in all three models, although it is only significant in the third. Per capita GDP, however, is positively associated with sustainability, and is significant in the first and third models. The difference between the two measures of wealth is population; it appears that countries with wealth but low population densities have a greater likelihood of being sustainable than those with the same wealth but higher populations.

In all three models, biocapacity has an impact which is statistically significant and roughly the same. This suggest that those more endowed with resources are more likely to be able to sustain a given level of economic growth; a finding which is not particularly surprising.

⁵ In an attempt to increase the explanatory power of each model, I added to the models population density, the proportion of GDP which is accounted for by manufacturing, the United Nations Human Development Index, the proportion of a country which is comprised of national parks and a measure of openness to trade. A higher population density and a greater proportion of GDP accounted for by manufacturing have been associated with lower sustainability in the past (Grossman & Krueger, 1995), whilst openness to trade has been associated with greater sustainability (Antweiler, Copeland, & Taylor, 2001). The Human Development Index is used as a broader measure of national well-being than per capita GDP, and the national parks measure is designed to capture the extent to which each country values nature. None of these variables added a great deal of explanatory power, with the best-specified giving R^2 values slightly in excess of 0.6. Further details of these models are available from the author upon request.

Table Two suggests that a larger government leads to a less sustainable society.

However, this result is only statistically significant at the ten percent level, and even this level of significance is sensitive to small changes in the model (swapping GINI for PWR, for example). It is more accurate to say that there does not appear to be any consistent link between the size of a government and the sustainability of the society which it governs. This suggests that governments are unlikely to improve sustainability simply by increasing their share of the economy.

However, Model Two does not address the issue of the quality of government. To explore this further, I examine the World Bank Resource Allocation Index (see <http://go.worldbank.org/FHNU4A23U0>), which contains an indicators assessing the extent to which government policies support the sustainable use of resources and the protection of the environment. If this variable is added to Model Two, above, one obtains Model 2A, the results of which are detailed in Table Four. Note that EPOL represents this World Bank variable, and that the number of countries in the sample fall substantially to only 32. Heteroscedasticity results are similar to Table Two and are not repeated.

Table Four about here

Most variables have similar results to Table Two, and environmental policy is both positive and significant, suggesting it can have a major impact on sustainability. However, this finding needs to be interpreted with some caution. Part of the analysis of the efficacy of government policy in supporting sustainability is an examination of the track record of prior policy. For this reason, EPOL is not entirely exogenous and thus the true effects of environmental policy are likely to be smaller than shown above. The most robust conclusion that can be drawn from Models Two and 2A, is that government spending per se does little to support sustainability, but that government policy can, as Goll & Thio (2008) suggest, play a role in creating cultural norms which support sustainability. The interesting aspect of the Aboriginal experience from this perspective is that they required no government policy leadership to create such norms. For Aborigines, spiritual beliefs underpinned their cultural norms favouring sustainability. One extension to this paper could be to explore how other societies have created such cultural norms, and whether norms

⁶ It is only significant at the ten percent level in Model Three, which is likely to be because in this smaller, richer sample, democracies are more prevalent, and hence there is less variation in this variable.

created by religion, government or some other factor are the most robust. Of interest also is whether we in the modern world have an avenue other than government to create such norms; could we, for example, use religion, and if so, how might we do so?

In Table Three, the most obvious result is that neither religion nor trust has a statistically significant effect, even though each effect is positive. This suggests that neither has a significant impact on sustainability in the modern world. However, these findings should be interpreted with some caution, due to the crudity of the measures used.

5. Conclusions

Australia's Aboriginal inhabitants maintained (and still maintain) a culture which has sustained their landscape for tens of thousands of years, arguably making them the most sustainable culture on earth. Policymakers today are concerned about the sustainability of modern society and are thus looking for models which might improve it. Aboriginal Australia, with its long history, is one potential model, and the analysis above suggests that its polycentric power structures, lack of focus on material wealth, strong cultural norms of reciprocity and spiritual connection to the land being managed were all important factors in managing that land sustainably. Interestingly, Aboriginal society managed their land sustainably without an overarching government structure, suggesting that government is not necessary to build cultural norms of sustainability nor enforce these norms.

Whilst Aboriginal Australia is a potential model, one is immediately struck by the question of whether it is just too different from the modern world to provide realistic lessons. Whether this is true or not is difficult to answer conclusively in a short paper such as this, but there does appear to be some grounds for optimism. Ostrom (1990) and others have suggested that some common principles underlie sustainable resource governance in a wide variety of societal contexts and as this paper shows, this includes Aboriginal Australia. Moreover, as the empirical analysis in this paper shows, modern countries which have absorbed these lessons better are precisely the ones which are more sustainable. To the author at least, this is somewhat heartening; we do not march into a dark future alone, but rather do so illuminated by the lessons each society in humanity's past, however different from our own, have left for us.

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Table One: Model One - No Government Variable (n=132)

Variable Name	Coefficient	t-ratio	Average	St. Dev.
POLY	-1.2406	-6.401	2.6818	2.8320
GINI	-0.0712	-1.221	41.1121	10.1511
LPCP	1.4927	2.443	8.6962	1.3325
LGDP	-0.6069	-1.610	11.3168	1.8755
BCAP	0.8708	5.201	3.3497	4.1386
CONSTANT	47.166	9.552		
Diagnostics				
R-Squared			0.5717	
Adjusted R-Squared			0.5547	
Log of Likelihood Function			-411.557	
F-Test			33.638	
Heteroscedasticity Test Results (p-values)				
ARCH Test (Engle, 1982)			0.23459	
Harvey (1976) Test			0.53414	
Gljeser (1969) Test			0.01656	
White (1980) Test			0.04151	

Table Two: Model Two - With Government Variable (n=92)

Variable Name	Coefficient	t-ratio	Average	St. Dev.
EIUD	1.8446	4.499	6.1618	2.1829
PWR	0.0386	1.081	44.3152	18.4072
LPCP	1.1469	1.242	8.8997	1.3655
LGDP	-0.7631	-1.559	11.4976	2.0292
GOV	-0.1002	-1.840	28.1245	10.1419
BCAP	0.9137	5.520	3.8584	4.5955
CONSTANT	36.213	8.611		
Diagnostics				
R-Squared			0.5707	
Adjusted R-Squared			0.5404	
Log of Likelihood Function			-288.281	
F-Test			18.834	
Heteroscedasticity Test Results (p-values)				
ARCH Test (Engle, 1982)			0.41393	
Harvey (1976) Test			0.18264	
Gljeser (1969) Test			0.05312	
White (1980) Test			0.04498	

Table Three: Model Three - With Religion and Trust Variables (n=50)

Variable Name	Coefficient	t-ratio	Average	St. Dev.
POLY	-1.0957	-1.949	1.0600	1.5702
GINI	0.0563	0.4206	37.1040	9.1052
LPCP	2.2272	2.715	9.7035	0.9052
LGDP	-1.3710	-2.314	12.8547	1.4534
GOV	-0.0784	-1.099	30.0287	10.6489
BCAP	1.0785	3.482	3.8153	4.13121
REL	0.27965	0.4730	3.8207	1.9948
TRUST	0.0731	1.218	29.5647	16.4289
CONSTANT	43.944	4.785		
Diagnostics				
R-Squared			0.6176	
Adjusted R-Squared			0.5430	
Log of Likelihood Function			-155.227	
F-Test			8.279	
Heteroscedasticity Test Results (p-values)				
ARCH Test (Engle, 1982)			0.2958	
Harvey (1976) Test			0.1424	
Gljeser (1969) Test			0.1563	
White (1980) Test			0.2833	

Table Four: Model 2A - Government Spending with Government Environmental Policy
(n=32)

Variable Name	Coefficient	t-ratio	Average	St. Dev.
POLY	-0.9348	-2.103	3.1563	2.1115
PWR	0.0543	0.6581	46.0750	13.0927
LPCP	2.1713	1.383	7.3315	0.7510
LGDP	-1.0826	-1.683	9.7882	1.6957
GOV	0.0254	0.2629	24.2320	8.9153
BCAP	0.6541	2.848	3.2010	4.2164
EPOL	4.2442	2.412	3.1875	0.5198
CONSTANT	26.540	2.325		
Diagnostics				
R-Squared			0.5456	
Adjusted R-Squared			0.4131	
Log of Likelihood Function			-88.2816	
F-Test			4.117	