

On the Value of Environmental Pragmatism in
Economic Decision-Making,
With Special Reference to the Work of Bryan Norton

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DECLARATION

By submitting this thesis electronically, I declare that the entirety of the work contained therein is my own, original work, that I am the owner of the copyright thereof (unless to the extent explicitly otherwise stated) and that I have not previously in its entirety or in part submitted it for obtaining any qualification.

Date: 2 March 2009

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SUMMARY

This thesis sets out to uncover why environmental concerns are not being effectively addressed in economic decision-making. It investigates this by analyzing the key values underpinning neoclassical economics and ecological economics, and concludes that both approaches remain trapped in a form of moral monism and are thus unable to express the full range of environmental values that exist. This results in a form of reductionism in economic thinking where all environmental value is expressed in the form of exchange value. In order to escape from this reductionism, it is asserted that ecological economics needs to adopt a moral pluralist philosophy that can accommodate both exchange values and subjective intrinsic value.

Mindful of the quagmires of moral relativism, the thesis seeks out an approach to economic decision-making that is able to justify courses of action amid seemingly competing economic and environmental values. Environmental pragmatism, a form of moral pluralism, that focuses on the contextual nature of truth and value, is found fitting for the task. It uses experience to reduce uncertainty and moves decision-makers towards courses of action that can support a plurality of values within a given context. Environmental pragmatist Bryan Norton's philosophy of adaptive management, with its guidelines of experimentalism, multi-scalar analysis and localism, is found to be particularly helpful in achieving this.

The second half of the thesis concentrates on demonstrating the value of environmental pragmatism in economic decision-making by using it to analyse the South African National Budget of 2005. Norton's guidelines are first used as critical tools of analysis to show up the gaps and inconsistencies in the budget process and then, secondly, as creative tools to reconstruct the budget process. To demonstrate what this would mean in concrete terms, the Department of Environmental Affairs and Tourism, the Department of Trade and Industry and the Department

of Agriculture budget votes are analysed using the sustainability indicators of The City of Cape Town's Sustainability Report of 2005 and the 2020 goals of The City of Cape Town's Integrated Development Plan of 2004/5.

OPSOMMING

Hierdie tesis bepaal waarom omgewingskwessies nie effektief aangespreek word in ekonomiese besluitnemingsprosesse nie. Die sleutelwaardes onderliggend aan neo-klassieke ekonomie en ekologiese ekonomie word ondersoek en daar word tot die gevolgtrekking gekom dat beide benaderings vasgevang is in 'n vorm van morele monisme en dus nie daartoe in staat is om die volle omvang van omgewingswaardes te weerspieël nie. As gevolg hiervan ontstaan 'n vorm van reduksionisme waarvolgens alle omgewingswaardes in die vorm van uitruiltransaksies uitgedruk word. Ten einde hierdie soort reduksionisme te vermy, word daar voorgestel dat ekologiese ekonomie 'n morele pluralistiese filosofie aanneem ten einde beide ruilwaardes en subjektiewe intrinsieke waardes te akkomodeer.

Bewus van die gevare van morele relativisme, ontwikkel die proefskrif 'n benadering tot ekonomiese besluitneming wat in staat is daartoe om bepaalde keuses – te midde van skynbaar konflikterende ekonomiese en omgewingswaardes – te regverdig. Omgewingspragmatisme, 'n soort morele pluralisme wat die kontekstuele aard van waarheid en waarde benadruk, word as die mees toepaslike benadering in dié verband voorgelê. Dié benadering berus op ervaring om onsekerheid te reduseer en besluitnemers te oortuig dat bepaalde aksies 'n pluraliteit van waardes kan ondersteun binne 'n gegewe konteks. Die omgewingspragmatis, Bryan Norton se filosofie van aanpasbare bestuur, met riglyne vir eksperimentering, multi-skaal analise en plaaslikheid blyk 'n gepaste basis te wees waarop die benadering in die proefskrif ontwikkel word.

Die tweede helfte van die proefskrif demonstreer die waarde van omgewings pragmatisme in ekonomiese besluitneming aan die hand van 'n analise van die Suid-Afrikaanse Nasionale Begroting van 2005. Deur eerstens gebruik te maak van Norton se riglyne as kritiese instrumente van analise word die gapings en onkonsekwentheid van die begrotingsproses aangedui. Tweedens word hierdie riglyne as kreatiewe middels gebruik om die

begrotingsproses te
rekonstrueer. Ten einde aan te dui wat die praktiese implikasie van
so 'n alternatiewe proses sou
behels, word die onderskeie begrotingsposte van die Departemente van
Omgewingsake en
Toerisme, Handel en Nywerheid, en Landbou geanaliseer deur gebruik
te maak van die
volhoubaarheidsindikatore van die Kaapstad Volhoubaarheidsverslag
van 2005 en die 2020
doelwitte van Kaapstad se Geïntegreerde Ontwikkelingsplan van
2004/5.

DEDICATION

To the Creator, without Whom nothing is possible.

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INTRODUCTION

South Africa is caught between a rock and a hard place. The country's environment is deteriorating: there is increasing pollution, declining air quality is affecting the health of people, natural resources are being exploited unsustainably, water quality and aquatic ecosystems are declining, land degradation is serious and 20 species of commercial and recreational marine fish are considered over-exploited. (South Africa. Department of Environmental Affairs and Tourism

(DEAT), 2006a: 2) This, when the basic needs of many of the current generation have not been met: unemployment and inequality is extremely high, poverty persists and many of the poor are still directly dependent on natural resources to survive. They are dependent on the very natural resources that are under threat of further deterioration.

South African government officials are feeling the pinch. They are being asked to do the impossible. One arm of government is told to promote growth, job creation, industry and development and the other arm is told to protect the environment from further exploitation. How are both of these possible? Is there a way of balancing the need for increased development with the need to protect the environment from further degradation? It is this dilemma that has led to the question that is central to this thesis: What, in terms of the environment, is an ethical economy?

This question is an important one at this time in South Africa's economic history when the country's aim is to become a competitive player in the global market economy. The country's national budget is geared towards achieving this aim so as to increase job opportunities and meet the needs of its citizens. While the environment is protected in section 24 of the Constitution where it is stated that "everyone has a right to an environment that is not harmful to their health or well-being" (South Africa, 1996: 10, 11) the latest government issued report on the state of environment (South Africa. DEAT, 2006a) is sending out alarm signals that there is cause for concern about our ability to uphold this right, now and in the future.

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My aim, in this thesis, is to look at what lies at the heart of our economic system that is forcing us into this impossible situation. My search leads me to a discussion of the environmental values that underpin economic decision-making. In the first chapter, I explore the understanding of neoclassical economics that the environment should be valued for its use value as determined by consumer preferences in the market place. I critically evaluate this approach with an attack on its characterization of the environment as an "externality", that can be included as a factor in the price of producing goods and services.

The second half of the first chapter is dedicated to how ecological economics, a more evolved form of neo-classical economics, attempts to address some of the short-comings of the neoclassical economic approach by including other social values like equity, the distribution of income and the health of ecosystems. Despite its broadening of consumer preferences to include other more noble social concerns, I find ecological economics unable to let go of its fixation on the market mechanism as a means of determining environmental value. I claim it remains trapped in a monistic utilitarian environmental ethic that is the root cause of our dilemma.

In the second chapter, I explore ways of breaking this fixation on exchange value determined by consumer preferences and argue for a form of moral pluralism that will introduce other ways of valuing the environment within economic decision-making. I do not argue for abandoning monetary exchange values as one source of value; however, I wish to make space for subjective intrinsic valuation. Attempting this leads me to environmental pragmatism, a pluralist value system that focuses on the contextual nature of values. I explore, with the help of pragmatism, what it means to take seriously the constructed nature of facts and reality. I discuss, with the help of other environmental ethicists, Norton's version of environmental pragmatism and show that it overcomes moral relativism and allows for justifiable ethical choices within the economy without casting out consumer preferences altogether.

The second half of this thesis is dedicated to applying these insights gleaned from Norton's ethical approach to the South African National Budget process and three departmental votes in the 2005 South African National Budget. I show how the current budget process and the 2005 Estimate of National Expenditure reflect an ecological economic approach towards the

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environment in South Africa. I discuss how Norton's ethic, through its focus on context, multiple scales of time and experiential learning could break the South African National Budget's current inability to respond effectively to the environmental concerns mentioned at the start of this introduction. I discuss the kind of processes that need to be put in place in a budget to

accommodate Norton's ethic.

I end with hope: hope that environmental pragmatism, a humble philosophy that takes seriously local values, long term outcomes and the experiences of people, can make a contribution to a sustainable budget process as well as more sustainable government planning, improved economic decision-making and ultimately the promotion of environmental values for current and future generations.

Before proceeding with the text, a point of clarification is needed. This thesis is first and foremost an attempt to find answers to a real life problem, i.e., why, despite the sensitivity to environmental concerns within current economic decision-making, environmental degradation continues on the scale it does? I find the problem located in the values driving environmental decision-making within the economy. I find the solution in the philosophy of environmental pragmatism as proposed by Bryan Norton.

However, this thesis is not a detailed discussion or a critique of environmental pragmatism per se, or an exploration of its various proponents' contributions, but rather the demonstration of the value of one particular environmental pragmatist, Bryan Norton's environmental pragmatist methodology for addressing environmental concerns in economic decision-making. The first half of the thesis focuses on identifying the nature of the problem within economic decision-making and justifying the need for Norton's environmental pragmatist methodology. The second half focuses on demonstrating the potential power of Norton's approach when applied to an important economic tool, a national budget.

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CHAPTER ONE:
CURRENT ECONOMIC APPROACHES TO VALUING THE ENVIRONMENT
WITHIN THE ECONOMY
A. Introduction

In a country like South Africa, which recorded a Gini-coefficient of 0.72 in 2005, there is a strong moral argument for attending to the needs of poor citizens. In the same year, 67% of South Africans were living on less than R593 a month and 47.1% were living on

less than R322 a month.

1

(Armstrong, Lekezwa and Siebrits, 2008: 5, 9). The needs of the poor are related to primary health care, education, nutrition and sanitation. A large percentage of the South African budget goes towards meeting these needs. Given the inequality and poverty levels, it is a struggle to convince government to protect the environment for its own sake. In this chapter, I will demonstrate how the environment, if it is explicitly valued at all in economic thinking, is nearly always valued for its ability to provide for human needs, especially in South Africa.

It is generally understood that environmental ethicists, many of whom make arguments for why the environment should be valued intrinsically, and economists, most of whom value the environment for its ability to be transformed to meet human needs, continually speak past each other.

This has resulted in economic decision-making itself being labelled the enemy by environmentalists, and economists carrying on with their own methods of evaluation, i.e. treating the environment as an externality and placing monetary values on it so that it can be included as a factor in the pricing of goods and services.

In this chapter, I make the claim that the focus of neo-classical economics on the market mechanism as the means of including environmental considerations into economic decision-making is insufficient, because it excludes the other ways in which human beings value the natural environment. I show this by examining the tools that neoclassical economics uses to value the environment: Pigouvian taxes and/or subsidies and

1

These statistics are based on prices in the year 2000.

1

Coasian property rights. I discuss the information difficulties associated with Pigouvian

taxes and Coasian property rights, making a case for the latter being easier to manage but pointing out that neither of these methods are able to exhaustively account for environmental losses or gains.

In the second half of the chapter, I discuss how ecological economics criticises neoclassical economics. I show how ecological economics calls for the market place to look beyond short-term consumer demands, and to place them within the context of ecosystem limits. I debate the role of science and technology, evaluating the technological optimism of neo-classical economics and the need to exercise caution in the face of the complexity of environmental impacts. The inability of the market mechanism to deal with issues of equity in the distribution of natural resources is another point of concern. Ecological economics is critical of the fact that neo-classical economics is unable to address equity in the distribution of resources both within current generations and between generations.

In the third section of this chapter, I show that even though ecological economics is effective at showing up the limitations of the neo-classical approach to the environment, it is not able to provide us with an effective way of managing the relationship between the environment and the economy. This is because it still confines its valuation of the environment largely to the market mechanism, focusing mostly on putting monetary values on aspects of the environment. I discuss how this results in the impoverishment of the tools of analysis of ecological economics in that it is unable to embrace the myriad of other non-utilitarian ways in which human beings value their environment.

Before proceeding with the discussion it is important to clarify a deliberate methodological choice in this thesis. When embarking on the thesis, I intended to include development economics. However, I discovered in my reading that ecological economics, despite some differences, had taken some of the concerns of development economics on board like, for example, issues of the distribution of wealth and the discrepancy between

consumer preferences and actual consumer welfare.

2

I decided that it would detract

from the central focus of the argument, which is to show the value of a pluralist and environmental pragmatist approach to economic decision-making on the environment, if I included development economics as a separate field of study.

Secondly, I wish to state that this thesis is first and foremost a philosophical thesis the purpose of which is to show how a particular approach to environmental ethics, environmental pragmatism, can contribute to improved decision-making about the environment. My discussion of neo-classical economics and ecological economics is essentially a value analysis of these subfields of economics to ascertain what are the central values driving discussion on environmental concerns in them. This value analysis is by nature a theoretical exercise and not an empirical study. Therefore, I ignore the various institutional checks and balances that a particular economic system may successfully or unsuccessfully put in place to correct the imbalances of the market system. It follows that I largely discuss the market system in ideal terms.

I believe this approach is necessary and valuable because it identifies the core problem in economic decision-making about the environment, an over focus on consumer preferences and a failure to accommodate other subjective intrinsic environmental values.

It is the identification of this value problem that leads me, with the help of Bryan Norton's tools of analysis in the second half of the thesis, to suggest certain institutional changes to the budget process and within the budget votes.

2

Sen, A. 2002. Response to Commentaries. *Studies in Comparative International Development* 37 (2): 7886, Summer. <http://www.springerlink.com.ez.sun.ac.za/content/rfjwqt4rx4hquc7m/fulltext.pdf> [22 February 2009].

3

These suggested institutional changes that are inspired by adaptive management could be interpreted as overlapping with some of the broad themes in institutional economics that call for governments to ensure that the shortcomings of the market mechanism are addressed via corrective institutions within the economy.

3

Thirdly, it is important to clarify how I use the concept of environment in the context of this thesis. Philosophically, I understand the concept in the pragmatist sense to include everything that forms part of the human context, from wilderness to industrial areas and also, in keeping with Dewey's pragmatism, including human experience itself.

(McDonald, 2002: 193–196) In chapter one of the thesis, I focus on showing how the environment is largely valued as a resource for human beings in the neo-classical economic framework and does not include subjective human intrinsic valuations of nature, like sense of place values. I wish to extend this mostly physical understanding of the environment to the pragmatist view of everything, including spiritual and aesthetic environmental experiences.

In this thesis I do not focus explicitly on how one could better use environmental resources with more appropriate alternative technology. This is not done because I believe that this is inappropriate research; it is just that it is not the explicit focus of this thesis, the aim of which is to conduct a value analysis of economic decision-making. A more empirical analysis of how one could adapt production processes so they not only harm the natural environment less but also benefit ecosystems would also be helpful.

3

North, D.C. 1993. Nobel Prize Lecture.

http://nobelprize.org/nobel_prizes/economics/laureates/1993/north-lecture.html [21 February 2009].

4

There is literature available that makes these kinds of suggestions by arguing that one should decouple the economy from environmental degradation by using improved technologies and/or that countries should dematerialize economic activity by decreasing material throughput in the economy so as to reduce the impact on ecosystems.

4

South

Africa's National Framework for Sustainable Development, a document that is discussed in chapter three of the thesis mentions both these concepts. (South Africa. DEAT, 2008: 13, 35)

B. The neo-classical approach to valuing the environment within the economy

The neo-classical vision involves firms, households or individuals making individual choices within the constraints imposed by other players in the market place. Value is therefore defined by these choices interacting with the constraints or the scarcity of goods, labour or services. This happens in the market place and market prices are signals to consumers at what costs their demands can be met. Firms or individuals are likely to produce goods and services for customers as long as the total cost of production is less than the revenue they will gain. The price and quantity will depend on items like labour costs, material costs or the cost of machinery juggled with a consumer's needs and income. (Pindyck and Rubinfeld, 2001: 24)

If the price of a good or service is above the market-clearing price level then a surplus situation results in which the quantity supplied exceeds the quantity demanded. To sell this surplus, producers will begin to lower prices. Eventually, as the price falls, the quantity demanded will increase, and the quantity supplied will adjust to the new level of demand. The opposite happens if the price is below equilibrium and where the quantity

4

Azar, C., Holmberg, J. & Karlsson, S. 2002. Decoupling Past Trends and Prospects for the Future.

<http://center.uvt.nl/staff/smolders/env/holmberg.pdf> [21 February 2009]

Bartelmus, P. 2003. Dematerialisation and Capital Maintenance: Two Sides of the Sustainability Coin.

Ecological Economics 46 (1): 61-81, August.

[http://www.sciencedirect.com.ez.sun.ac.za/science?](http://www.sciencedirect.com.ez.sun.ac.za/science?_ob=MImg&_imagekey=B6VDY-494S75H-17&_cdi=5995&_user=613892&_orig=bro)

[_ob=MImg&_imagekey=B6VDY-494S75H-17&_cdi=5995&_user=613892&_orig=bro](http://www.sciencedirect.com.ez.sun.ac.za/science?_ob=MImg&_imagekey=B6VDY-494S75H-17&_cdi=5995&_user=613892&_orig=bro)

[wse&_coverDate=08%2F31%2F2003&_sk=999539998&view=c](http://www.sciencedirect.com.ez.sun.ac.za/science?_ob=MImg&_imagekey=B6VDY-494S75H-17&_cdi=5995&_user=613892&_orig=bro)

[_ob=MImg&_imagekey=B6VDY-494S75H-17&_cdi=5995&_user=613892&_orig=bro](http://www.sciencedirect.com.ez.sun.ac.za/science?_ob=MImg&_imagekey=B6VDY-494S75H-17&_cdi=5995&_user=613892&_orig=bro)

[sdarticle.pdf](http://www.sciencedirect.com.ez.sun.ac.za/science?_ob=MImg&_imagekey=B6VDY-494S75H-17&_cdi=5995&_user=613892&_orig=bro)

[22 February 2009].

5

demanded exceeds the quantity supplied and consumers are unable to purchase as much as they like. This would push prices up until a new equilibrium is reached. Much of modern economics focuses on these supply and demand curves, finding ways of predicting them, analyzing them and looking at how they react to government policy announcements.

However, Pindyck and Rubinfeld (2001: 621, 622) point out that the market does not always function optimally, especially in terms of the environment. Market failures or negative externalities occur when the market imposes costs on another party without compensation. Positive externalities can also occur when the action of one party benefits another party without costs. An example of a negative environmental externality is when a steel plant dumps its waste in a river that fishermen downstream depend on for their daily catch. The more waste is dumped, the less fish survive, yet the fishermen are not compensated. There is no incentive for the steel factory to compensate the fishermen, and these external costs are not included in the price of steel.

Another important reason for market failure in terms of environmental goods and services is that they are largely public goods. Black, Calitz, Steenkamp & Associates (1999: 21, 22) describe how public goods are goods that cannot be divided into saleable units because they are not excludable. Air is an example of this because you cannot prevent

other people from using it. They also use the term "non-rival" to describe how in public goods one person's consumption does not always necessarily reduce the quantity available to others. Goods and services of this nature cannot be supplied efficiently by competitive markets because the marginal cost of additional users is zero. In neo-classical economics an efficient price is determined by the marginal cost of admitting another consumer so if the marginal cost is zero, the price is zero. A zero price does not enable the producer to cover the costs of providing the service.

Black et al (1999: 17, 18, 20) state that efficient production under competitive markets means that consumers need to be able to show what they prefer and how much of that good or service they require, so that producers can meet the demand. When this is

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revealed, the market "performs like a big auction" providing an equilibrium between what consumers are willing to pay and what producers are willing to supply. But competitive markets cannot operate if people are not able to reveal their preferences. What makes it possible for people to reveal their preferences is the fact that private goods are excludable from other people's use and that if they are being used by one person, they cannot simultaneously be used by another. Therefore, private goods are restricted to those individuals who reveal their preferences for those goods. Public goods on the other hand are not restricted to those who reveal their preferences. They are therefore non-rival. I can use them and so can you. Examples of public goods are national defence and street lighting. These two public goods also are not excludable because it is not possible to stop people from enjoying their benefits. One of the main problems with public goods, is what Heal (2000: 30, 31) calls the "free rider problem". There is no incentive for people to buy the good because they can get it for free if someone else buys it. If for example, one person pays for clean air in their neighbourhood, everyone benefits when the air is purified, regardless of whether they paid for it or not. There is no way of preventing those who did not pay for it from enjoying the benefits.

Heal (2000: 60) states that watersheds are good examples of ecosystems that act as public goods. Watersheds are areas of land that form the drainage of a stream or river. (Botkin & Keller, 2007: G-19) They incorporate ecosystems and are important for human beings because they are cost effective at controlling stream flow and they purify water. In both roles they have great economic value. It could be argued that their value in these roles are worth more than the agricultural value of the property or its value as a residential site. Therefore, one could say that it makes economic sense to protect them as areas. Heal states that despite their usefulness, they are often not adequately conserved. This is because water is not adequately priced, and therefore watersheds, that ensure that water flows and is purified, are undervalued.

Black et al (1999: 29) do not favour regulation as a means of dealing with externalities. This is because the regulation approach assumes that government is well enough informed to determine the output that is optimal when this is not necessarily the case.

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Using the example of coal-fired power stations, they state that even if a socially optimal air pollution output level could be worked out (this would need to be ascertained through time-consuming opinion surveys or contingent evaluation studies) it might not promote efficiency within individual firms. This is because if one forced all coal-fired power stations to reduce emissions by the same amount this would not promote efficiency in each firm. Some firms could produce much more with less pollution and other could produce much less at the same level of pollution. A tax on each unit of production is likely to produce more efficient behaviour.

Neo-classical economics prefers using Pigouvian taxes or Coasian property rights to regulation to address environmental externalities, because it allows the firm to adjust production factors for the most efficient use of resources. Pigouvian taxes or subsidies are either taxes that are levied on environmental externalities, like air pollution per unit, or

where beneficial, activities like solar heating are subsidized per unit so as to discourage pollution and promote more efficient use of natural resources. Secondly, there are Coasian property rights where the problem of negative environmental externalities is addressed through increasing the ownership of environmental goods and services. The thinking is that most environmental goods and services are public goods, and therefore, cannot be owned, so Coasian property rights attempt to create a form of ownership by developing a market for the legal rights to pollute, and allowing the trading of such rights. In the section that follows we discuss the functioning and effectiveness of these tools.

1. Pigouvian taxes and subsidies

The neo-classical approach to environmental economics seeks ways of either improving the functioning of the market through costing externalities, or extending the functioning of the market to avoid externalities. In an attempt to improve the functioning of the market, Pigouvian taxes and subsidies are created. In the case of negative externalities, Black et al (1999: 30) point out that a negative production externality leads to too much of a certain product being produced and too low a price. Therefore, when the government

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levies a Pigouvian tax on the firm responsible, the marginal private cost of producing their product is equal to the marginal social cost, society no longer has to pay any hidden costs. A Pigouvian tax is equal to the value of the externality that then increases the price of the product. The new prices will result in the supply of the product being higher than the demand at the new price. A new social equilibrium between supply and demand will be reached. It is important that if the tax is to be considered efficient it must be equal to the marginal external cost at the new social equilibrium. This leads to fair pricing and a subsequent realistic quantity of production.

Just how one would go about determining the value of that externality or environmental loss could be established in a number of ways. Heal (2000: 121-123)

mentions several:

the travel cost method, replacement costs and the real estate hedonic price method. Each of these different methods respectively look at what people are willing to pay to travel to a place and gain access, what they are willing to pay to replace something, and lastly what they are willing to pay for a particular characteristic such as a view, for instance. All of these methods are based on actual transactions where real prices are available. However, when none of these methods are able to be executed, then the remaining method available is the contingent valuation method. This involves asking a carefully selected sample of people how much they value a natural resource and then their answers are seen as representative of society as a whole.

The advantage of adopting the Pigouvian approach as opposed to a legal fine, is that it encourages the efficient behaviour of firms. While a regulation can either be adhered to or transgressed, a tax levied on each unit of the emissions of a firm will encourage the reduction of emissions to a level where the marginal cost of abatement per unit is less than the fee. Over and above this point, the firm will prefer to pay the fee, rather than reduce emissions. Pindyck and Rubinfeld (2001: 628) show that the Pigouvian approach promotes efficiency on the part of the firm and also helps to reduce emissions, whereas the regulation approach will not necessarily promote efficiency within the firm.

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This is because a firm could be producing its products with a net pollution level that is well under the regulated amount, but they could be using dirty technology, whereas a system regulating per unit would encourage efficient technology.

The practicalities of implementing Pigouvian taxes are criticized by Sagoff (2004: 108) who claims that the cost of measuring what people would pay to avoid pollution, is in itself too costly to measure. To measure the costs and benefits of pollution abatement, economists would have to find out what people were willing to pay for commodities and what they would be willing to accept in terms of standards of

pollution. He claims that if this information were easily available, individuals themselves would act on it to make their own bargains. Using the example of a factory that pollutes a neighbourhood, he supposes that if both residents and the factory owners know that a device costing \$100 000 could eliminate pollution that residents were willing to pay \$200 000 to avoid, this information would lead the two parties to reach an agreement.

Sagoff (2004: 108, 109) is of the opinion that governments are in no better position to establish the external costs of pollution or waste. Private agents only have to meet each others demand but public officials must get the approval of the bureaucratic structures for their estimates of what things are worth. Sagoff points out that these estimates must withstand litigation. With all the political lobbying and legal footwork that is necessary, he is doubtful that bureaucrats are able to achieve what private agents are. Moreover, it may cost governments too much to measure the environmental losses in a single episode of pollution. Sagoff (2004: 108) says this happened in the early 1990s when the USA government spent \$30 million on employing experts to assess the damages that were caused by the discharge of DDT (an insecticide) and PCBs (industrial pollutants) into the Los Angeles Harbour. The government paid about \$10 million for a contingent valuation study of how much people valued the loss of species of birds and fish. The study took 36 months to complete but was rejected by a court because it was alleged there were "faulty assumptions about the losses that occurred" (Sagoff, 2004: 108).

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Sagoff (2004: 109, 110) furthermore makes the critical point that expert assessments of costs and benefits become themselves goods that contending interests may be willing to pay for. The different interest groups hire different economists to provide different "economic measures" so that policy failure takes over where market failure left off. He is doubtful, however, about whether an objective standard can be found against which the differing ways of measuring the value of a given resource could be achieved. In the end

expert opinions, if they bear upon decisions that have significant political and economic consequences may become as hotly contested as the decisions themselves. He pointedly states that there is the danger that the Pigouvian approach simply transfers to government the costs of gathering information that market players otherwise would bear.

2. Coasian property rights

The second approach dealing with “environmental externalities” advocated by neoclassical economists was inspired by Nobel Laureate Ronald Coase, who argued that goods and services can be bought and sold only if they are owned or someone’s property. Heal (2000: 34, 35) points out that this is one of the problems with many environmental goods and services, they are not owned and because they are not owned, they are regarded as externalities in the market system. If property rights were extended to them, then they could be traded and their allocation could be regulated by the market and the legal system.

The problem of externalities in the Coasian approach therefore amounts to a dispute over who owns the right to use resources. It therefore sees externalities not as market failures but rather as the fact that the market is insufficiently extended. The Coase theorem assumes that provided property rights are well-defined and enforceable, market incentives will generate a mutually beneficial exchange of property rights through which externalities can be fully internalized. The Coasian approach does not question the morality of existing property rights. It sees the government’s role in respect of externalities mainly in the maintenance of a judicial system that defines and enforces property rights and a market system to lower transaction costs. Black et al (1999: 31)

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points out that the Coasian approach only works if property rights are well-defined and transaction costs are zero.

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It relies on a competent judicial system that can enforce

property rights and people with financial capacity to take legal action should there be transgressions. It also needs a market system to ensure that transaction costs are lowered.

Heal (2000: 36, 37) writes that Coase has inspired the approach of tradable emission quotas as used in the United States of America for controlling emissions of sulphur dioxide, lead additives and water discharges. Before an entity can emit a pollutant they must own the right to do so. They must purchase a tradable emission quota or TEQ to do this. The creation of these quotas establishes property rights over public goods like air. Heal describes the process like this: "If a business is forced to buy a quota before emitting a pollutant, then this also raises the private cost of pollution, in this case by the cost of the quota. Once again, private costs are changed so that they approach social costs. In fact, in a competitive quota market, private costs can be exactly equated to social costs by the inclusion of the costs of buying quotas ..." (Heal, 2000: 37)

Heal describes it as a simple calculation: the private cost plus the quota price that is equal to the social cost. To get the price of a quota to equal the difference between the private cost and the social cost, the government controls the number of quotas, raising their price by lowering their number on the market, or lowering their price by issuing more quotas. The tradable permit system gives the government a fair amount of control over the amount of pollution emitted. The government sells legal permits giving owners the right to pollute. It first establishes the overall quantity of pollutants that it considers to be an efficient level, and then sells a limited number of individual permits to the highest bidder. The price of these permits should ideally clear the market so that the amount of pollution equals the permissible level determined by government. Producers who do not want to pay the effluent fee by obtaining permits would have to reconsider their production processes because they do not have the right to pollute.

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Institutional economics makes the point that markets only perform

efficiently when transactions are zero. Transaction costs are seldom zero and are largely dependent on what institutions a society possesses. (North, 1993)

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Pindyck and Rubinfeld (2001: 630) support this approach, because it does not concern itself with how to weigh up costs and benefits as Pigouvian taxes does. They state that under the system of transferable emission permits each firm must have permits to generate emissions with each permit specifying the number of units of emissions the firm is permitted to emit. The total number of permits is limited by government to achieve the desired maximum level of emissions. The permits are marketable and therefore can be bought and sold. If there are enough firms, emission permits create a market for externalities. This approach is appealing because it combines some of the advantageous features of a system of regulated standards, that is, it puts a cap on the amount of pollution with the revenue generating advantages of a fee system. The agency that administers the system determines the total number of permits. Black et al (1999: 31) sees the advantages of the Coasian approach as being that it could drive up effluent fees dramatically and boost government income. This is because government is in control of the number of quotas being issued.

However, this system is not without its problems. Under Pigouvian taxes, we discussed how painstaking it is for government to establish what people are willing to pay for pollution abatement, and what they are willing to pay for commodities producing the pollution. This is a highly technical exercise that is not always conclusive. In the Coasian approach, governments categorically determine the number of quotas to make up the social cost of a production activity. The market forces come into play after this decision, leaving the government the seemingly simple task of determining once and for all an overall acceptable level of pollution. However, it is still subject to information constraints, much like Pigouvian taxes, in that they rely on the fact that the correct

information about what is an acceptable level of pollution is indeed available. How is it possible to determine this? Does government have sufficient expertise within its structures to determine the effect of levels of pollution on plants, water bodies and human health? Who, within government, determines this and how do they justify these levels of pollution once they have been decided upon? It is not impossible to do this but it is time consuming and not without controversial outcomes.

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Where Coasian tradable permits are an improvement, is that it allows government a lot more control of the generation of pollution abatement revenue and pollution levels, in that they are able to control the number of permits, pushing prices up or down.

But even within the neo-classical understanding of the relationship between the environment and the economy, there is doubt as to whether the Coasian approach is able to account for all environmental costs. Heal (2000: 185) makes the point that too many environmental goods are public goods and too many environmental problems cannot be solved by property rights. Using the example of the marine environment, he says that it is difficult to bring this within the scope of law and property rights. Ocean tides and creatures do not adhere to human boundaries but constantly transverse borders. Similarly, the atmosphere could not easily be owned, given that it is fluid and in constant motion.

In conclusion, it is reasonable to state, given the above discussion, that the neo-classical approach towards the relationship between the environment and the economy is insufficient. It is so in that it presupposes that the market is able to effectively cost all environmental externalities in the form of government regulation, and/or Pigouvian taxes, and/or Coasian property rights in a way that allows for the full protection of the environment. I have argued that it is not clear that this is possible to do, due to insufficient information regarding pollution, and the laborious and inconclusive nature of establishing consumers' willingness to pay for abatement. I agree

with Heal (2000: 185) when he states that the market cannot take care of all of the interactions between human beings and their environment. It would only be able to address those instances where the willingness-to-pay of consumers is easy to establish, information on the effect of levels of pollution are conclusive and easily obtainable, and in the case of tradable permits, where property rights can be established.

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C. Critical comments on neo-classical economics

The criticism of neo-classical economics has up until now largely been limited to how it defines the environment as an "externality" in the production processes of the economy. I now examine neo-classical economics through the eyes of ecological economics.

Ecological economics is an approach to economics that focuses on how human preferences, the lifeblood of the market mechanism, co-exist and co-evolve within the ecosystem opportunities and constraints. (Costanza and Wainger, 1991: 5)

This approach, although it does not depart from the centrality of the market mechanism in economic-decision-making, is critical of several aspects of it. These include: how neoclassical economics idealises consumer preferences as the most important indicator of human welfare; how neo-classical economics disregards the size of economic impacts on the environment, how neo-classical economics naïvely relies on science and technology to solve many of its problems and finally how it disregards how resources are distributed within and between generations. In the section that follows I will examine each of these issues.

1. Consumer preferences and human welfare

Neo-classical economics assumes that individual consumer welfare is our most important value. Individual welfare is calculated through consumer purchases expressed through market transactions. The ultimate way of increasing welfare is therefore to increase the quality and quantity of goods in the market. (Daly and Farley, 2004: 3, 4) However, can

we always assume that economic agents are always able to judge what is best for themselves? There are some instances where this is clearly not so. Norton highlights (2003: 191) how an extreme view on this can assume ridiculous proportions when he mentions the issue of sexual predators and addicts, the satisfaction of whose pleasures will result in harm to themselves and others.

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It would therefore seem wise to distinguish between those consumer preferences that are worthy and healthy to be pursued and those that are unacceptable. However, if we take for granted that most people are of healthy mind, can we assume that they will always make choices that are of the greatest benefit to themselves? There are clearly some instances where this is also not the case. People might donate money to support a good cause and not to receive a range of benefits. (Spash, 2002a: 207) They may even do this at great cost to themselves. Some economists might argue that this still affords them a feeling of goodwill but this does not accurately describe their reason for doing something, namely that it is the right thing to do rather than if it will benefit them.

However, even if people are in fact acting in their own self interest and are doing so in a way that does not harm others, they are often not able to make the best choices for themselves. Some people overestimate small probabilities and underestimate large ones. People's subjective risk perceptions and economic valuations could be biased for many reasons.

Johansson-Stenman (2002: 110, 111) alluding to the psychological theory of "cognitive dissonance," uses the example of people who cannot move from an area due to financial limitations, playing down the cancerous effect of radon in their water supply because they cannot afford to move. People alter their view on the risk involved because it is not in their immediate best interest to do so, whereas in the long-term it could cost them more dearly.

The standard assumption in the neo-classical approach to environmental economics, that people know their complete preferences with respect to all goods, and that the economists' role is simply to elicit them, is questioned by Johansson-Stenman (2002: 113, 114) who suggests an alternative view, one more common among psychologists. It states that we have developed preferences for only a few familiar goods, and that in most circumstances we find out what we like through making choices. Similarly, Spash (2002a: 207) states that economists rely upon a model of behaviour that assumes that values result from a given pre-existing preference ordering, and are merely articulated

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during a survey to reveal a "true" value. In contrast, psychology currently favours a theory of constructed preferences which are formed as required; for example, during a survey or contingent valuation process.

There are also times we make decisions based on what others think and this might, or might not be, within our interest. There are two well-known economic theories on consumer behaviour, i.e. the bandwagon effect, where many of us want to be fashionable and simply buy because others have something, and the snob effect, where we want something because few people have it. For some people, the most important dimension of a product like Italian sports cars is their exclusivity, the fact that only a few people own it pushes the price up. The point being made is that consumption involves interdependent consumers whose choices affect each other. (Pindyck and Rubinfeld, 2001: 127-131)

A neo-classical approach also assumes that people are always well-informed. It assumes that people make decisions in the market place based on full knowledge of all environmental costs. Standard neo-classical economic textbooks acknowledge that many of the choices people make involve considerable uncertainty. Pindyck and Rubinfeld (2001: 149) make the point that most people borrow to finance large purchases, such as a house or a college education, and plan to pay for them out of future income. This, when

future outcomes are uncertain, for their earnings can fluctuate, or they could lose their jobs, or become chronically ill.

In summary then, the fulfillment of consumer preferences might not lead to increased individual human welfare. In many instances, as we have shown above, they are, as Johansson-Stenman (2002: 113) suggests, context dependent "crude estimates of welfare". They are often formed on inadequate information by human beings who have at best a limited understanding of their own best interests. Norton (2003: 272-274) distinguishes between two different kinds of preferences: short term preferences based on individual preference, and longer term preferences, or sustainable value, that emerges from a community process and encourages preferences that promote long-term sustainability.

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The latter is more desirable from a sustainable development point of view, because it has the potential to include ecological considerations in economic decision-making. Neoclassical environmental economics, by focusing only on consumer sovereignty as a means from which to determine long-term social and environmental welfare, is therefore inadequate.

Sagoff (2004: 7) argues that all consumer preferences in the market place really tell us is the value of goods when they are exchanged. They do not tell us much about the benefit that those goods will provide. Economics can only help us to understand the conditions that determine value in exchange but it cannot measure the benefit of a product to society. I agree with Sagoff in this instance and interpret this as a blow to any endeavour that claims that economics is able to measure environmental value exclusively through the price mechanism. This means that the market or price is often the incorrect mechanism to determine the value of the environment.

Sometimes the exchange value of a good will conflate with the use value, but there is no guarantee that this will be the case, especially if we take into account the fact that consumers have limited knowledge about what is good for them and

their understanding of ecosystem limits is incomplete. Therefore, ecological economics needs to develop alternative methods or processes of valuing the environment within economic decisionmaking to make up for this short-coming of the price mechanism.

2. Issues of scale

The assumption of neo-classical economics that the market provides us with the most efficient allocation of resources is not disputed by ecological economics. Ecological economics supports the notion that resources are best allocated in conformity with individual preferences, weighed by the ability of the individual to pay.

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It also is in agreement that the policy instrument that is most useful for this is price, determined by supply and demand in competitive markets. (Costanza, Cumberland, Daly, Goodland, Norgaard, 1997: 80) Moreover, they acknowledge that the market mechanism, when operating under perfect conditions, can show impressive powers of self regulation. (Daly and Farley, 2004: 7)

However, ecological economics does not see efficient allocation as an "end in itself" in quite the same way as neo-classical economics does. (Daly and Farley, 2004: 4, 5). To illustrate the difference in emphasis, it is useful to look at Daly's metaphor of the earth being like a cargo ship. To load a cargo ship efficiently is to ensure an even weight distribution so that the ship floats evenly (the market mechanism of neo-classical economics), but it is even more important to make sure that not so much cargo is placed on the ship so that it sinks (ecological limits). The seaworthiness of the ship (the ecosystem health) is important because one cannot predict the weather for the voyage and we do not know exactly how heavy a load (ecological limits) is safe. Daly and Farley state that it is also important to ask who is entitled to put how much cargo on the ship (distribution of resources). One does not want all the cargo space to go to a few first class passengers so that there is no space for anyone else. Ecological

economics addresses these issues. It assumes that our goal is not simply to load the ship but to make it a comfortable space that future generations can also use.

Ecological economics sees itself as an evolution of neo-classical economics. It does not call for an end to markets but questions the call for growth, where growth is defined as an increase in the throughput i.e. the flow of natural resources from the environment through the economy and back into the environment as waste. (Daly and Farley, 2004: 6)

Ecological economics distinguishes this anti-growth stance from an anti-development approach. Development is seen as qualitative change and must continue, whereas growth cannot continue indefinitely, as the earth and its resources are finite.

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Key to understanding why ecological economics is critical of neo-classical economics is the issue of scale. Ecological economists see the economy as a subsection of the environment and not the environment as a subsection of the economy, which the discussion of the environment as an externality presupposes. Ecological economics describes the economy as an open system that gives out both matter and energy and the earth as an approximate closed system that circulates matter within the system but through which matter does not flow. (The earth is only "approximately" a closed system because it does exchange non-significant amounts of matter with outer space. Sunlight also enters the atmosphere of the earth and leaves in the form of radiating heat). (Daly and Farley, 2004: 15)

Why it is important to understand the difference between the two systems, is that when the economy expands it displaces aspects of the environment. That is to say the physical growth of the economy encroaches on the "finite", "non-growing" parts of the environment, demanding a sacrifice of something. (Daly and Farley, 2004: 16) This sacrifice is known as opportunity cost. Therefore, the actual size of the economy, that is the throughput of goods and services in the economy, is important

for ensuring a sustainable future. The more the economy, an open system within a closed system, grows the more aspects of the physical environment, an "approximate" closed system, are displaced. Growth, therefore, has a price in terms of the environment. Daly and Farley (2004: 16) state there will come a time when further growth within the environment will become "uneconomic" in the sense that the growth could cost us more, in terms of environmental losses, than it is worth.

It is against this background that the concept of scale is introduced. Scale, in ecological economics, is the physical volume of the throughput, the flow of matter-energy from the environment as low-entropy raw materials and back to the environment as high-entropy wastes from the entire macro-economy. (Costanza et al, 1997: 80) Daly and Farley (2004: 16, 17) point out that scale is not a new concept in neo-classical economics. In microeconomics the idea of optimal scale is well known. As one increases any activity, one increases the costs and benefits. Optimal scale is reached when the marginal costs of an

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activity are equal to the marginal benefits. If we go beyond the optimum then costs outweigh benefits, and the activity will make us poorer. However, in macro-economics this principle is not applied.

This is because in neo-classical economics the economy is considered the whole, and the environment only a part of the economy, therefore the opportunity cost of growth is zero, whereas in ecological economics the economy is seen as a sub-section of the environment. It would be inconsequential if the economy was only a small sub-section, but we live in a "full world economy" where the opportunity cost of growth is significant.

Daly and Farley (2004: 30-32) point out how ecological economics criticises neoclassical economics for forgetting that the circular flow of the economy between firms and households is not an isolated system that requires no energy input from the outside. Instead, ecological economics reads this theory of exchange value between goods and households against the background of the laws of thermodynamics. The

first law of thermodynamics states that input equals output plus accumulation. All raw materials in the economy eventually become waste outputs. Human beings deplete resources and pollute environmental sinks. It is not circular but a one-way flow. The second law of thermodynamics states that entropy never decreases in an isolated system. Energy is not recyclable, it moves from low entropy to high entropy. One can recycle goods but it always takes more energy to recycle than if it had not been used in the first place.

If we consider the economy in the light of the two laws of thermodynamics, then our natural resources, which are finite because the earth approximates a closed system, are being depleted and eventually they are going to run out. All replenishment in the flow of goods and services in the economy must be taken from our natural resources. Any recycling itself costs energy. It is for this reason that ecological economists argue that we need to address the problems of the economy in the following order: first establish ecological limits of sustainable scale and then establish policies that assure that the circular flow of goods and services between households and firms within the economy stays within these limits. (Costanza et al, 1997: 83)

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Daly and Farley (2004: 274) criticize the concept of the opportunity cost of capital that suggests that the future will be better depending on the investments we make now. They point out that ecological economists are saying that there is no guarantee that the future will be better, especially if we constantly deplete our natural resources. They suggest that natural capital be treated differently and separately from goods and services because they are not substitutes but are complements. Natural capital should be given a negative discount rate (it should be worth more in the future), and only market goods and services should be given a positive discount rate. It is also because goods and services and natural capital are complements rather than substitutes that we cannot rely on technology to save us from resource depletion. Technology can help us to find new resources to deal with

old problems, but it cannot actually replace the resources. Advances in technology often lead to increased exploitation of natural resources.

Philosopher Mark Sagoff (2004: 162–165) criticizes ecological economists for claiming that the basic relation between man-made and natural capital is complementary, not substitutable, i.e. that extra sawmills cannot compensate for diminishing forests. He says the problem with this argument is that it does not recognize the neo-classical assumption that resource scarcity will generate price signals that will cause compensating economic or technological developments like resource substitution, recycling or more efficient use of resources. Aquaculture, for example, could replace ocean fishing as these resources become scarce. Neo-classical economists are suggesting that while refineries cannot substitute for petroleum reserve, human knowledge and ingenuity can find substitutes for petroleum, like for example using the sun.

Sagoff's claim that human ingenuity is always able to provide solutions to scarcity, would seem wishful thinking to some environmentalists who could counter claim that the loss of certain freshwater resources, for example, might lead to the irretrievable devastation of ecosystems. It is for this reason that ecological economists argue for the maintenance of natural capital and the preservation of ecological sustainability (Costanza et al, 1997: 107). In order to maintain natural capital Costanza (1991: 16) argues for the use of the following criteria: for renewable resources the rate of harvest should not

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exceed the rate of regeneration and the rates of waste generation from projects should not exceed the assimilative capacity of the environment; for non-renewable alternatives, the rates of waste generation from projects should not exceed the assimilative capacity of the environment and the depletion of non-renewable resources should require comparable development of renewable substitutes for that resource.

However, Sagoff (2004: 165–168) accuses ecological economists of using the term "growth" in an unusual sense. What ecological economists mean by the

term growth, he argues, is an increase in the physical scale, quantity or volume of matter moving from low to high entropy waste. However, this is not how the term is used in neo-classical economics. Growth in neo-classical economics refers to the rate of increase of Gross Domestic Product (GDP). He states that although emissions or pollution sometimes increase with GDP, this is not always the case. Sometimes economies grow, and per capita emissions decline. He makes the point that in developing economies it is often the absence of economic growth, rather than its presence, that causes forest destruction, erosion and the loss of biodiversity.

The relevant point here is that growth in Gross Domestic Product does not necessarily lead to increased pollution, but it could if clean technologies are not used. The scale or size of an economic activity, measured in terms of the volume or quantity of the flow of matter that runs through it, is not directly related to environmental quality. It depends what kind of substance is being talked about. Sagoff (2004: 167) states that one would be concerned about a gallon of spilled mercury but not over a gallon of spilled milk. He is of the opinion that the concern of neo-classical economists about certain kinds of throughput is a more helpful pre-occupation than worrying about scale. If ecological economists had to swap the concept of "scale" with "kinds of throughput" they could focus on the pollutants that were harmful to the environment. (Sagoff, 2004: 168)

An ecological economic argument could be made for a combination of both scale and kinds of throughput as necessary considerations in determining the impact of current economic activity on resources for future generations. Any commodity has the potential

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of becoming a problem in a context, for example, carbon dioxide is a substance that promotes tree growth and it is also a greenhouse gas that causes global warming. Too much carbon dioxide could change a habitat from savannah with partial tree cover to full tree cover or forest. (Joubert 2006: 63, 64) This might significantly alter species survival

in an area. The point being made is that the intricate nature of relationships within ecosystems requires sensitivity to both the quantity and type of throughput in order to be sustained.

3. The Role of Science and Technology

An implicit rule of neo-classical economics is the assumption that diminishing natural capital is substitutable with man-made capital. It is assumed that declining natural capital can be replaced by increasing manufactured or human capital, because they are substitutes. Wallart (1999: 61, 62) points out that this is optimistic thinking. An increasing population and increasing consumption per capita, will put pressure on natural resources and they will not always be able to be substituted. While technology can solve some environmental problems, it can also create new ones. This shows that technology cannot be seen as the all encompassing solution to dwindling natural resources.

Wallart (1999: 62, 63) criticizes these optimistic assumptions about substitutability and points out that physical capital often has to be accompanied by natural resources for it to be used in the market. Natural and physical capital is complements, not only substitutes. Using an oil refinery as an example, he states that no matter how sophisticated the technology you cannot have an oil refinery without oil. There are also "irreversibilities" in the environment, i.e. when a species becomes extinct or when an environment is unable to return to its natural state following an episode of excessive pollution.

Ecological economics asks whether we always know what environmental costs we are imposing on our environment through the choices we make. Wallart (1999: 62) points out that environmental problems are not always sufficiently understood and their consequences are often difficult to quantify.

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The hole in the ozone layer is a case in point. If one were to apply a purely neo-classical approach by using Pigouvian taxes to address the cause of it, a lengthy inconclusive

process would result.

Wallart describes the process of addressing the hole in the ozone layer as follows: "First, it is necessary for scientists to understand and quantify the phenomenon precisely; then, they have to forecast and quantify its exact consequences; then, economists have to translate these consequences into accurate estimates of external costs; and finally, a corresponding tax would have to be legislated, passed and implemented.

Each stage of the process is uncertain, and diminishes the probability that the tax will ever accurately reflect the external costs." (Wallart, 1999: 62)

Spash (2002b: 121, 122) discusses the issue of certainty in economic and scientific

thinking. He makes the point that these two disciplines are characterized by strong uncertainty. This is because knowledge is often incomplete in economics and science and moreover, there are so many variables involved in predicting outcomes. Therefore one cannot guarantee certainty in these sciences. It is impossible, for example, to predict all the effects of an economic depression on individual consumer choices. Similarly, in scientific reasoning about global warming, the intricate nature of ecosystems, makes it difficult to predict environmental outcomes with absolute accuracy.

Owing to the fact that neo-classical economic thinking about the environment involves the analysis of complex social and environmental systems, many unknown outcomes can be expected. This is because not only are these economic systems operating in complex social systems but they also have impacts within a highly complex ecological system, making uncertain, unpredictable consequences very likely. It is for this reason that ecological economists, neo-classical economists, treat uncertainty as a characteristic of all information.

Ecological economists believe that science can tell us the range of uncertainty about issues like global warming and something about the relative probabilities of different

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outcomes. However, it is unable to tell specifically if something

will definitely happen.

When science is regarded as a vehicle that reveals the magnitude of our ignorance about issues of importance, rather than a method that establishes certainty, it invites an attitude of caution rather than one of bold recklessness. Instead of denying uncertainty ecological economists believe one should embrace it and look at ways of reducing it. This can be achieved by encouraging technologies that have a lower impact on the environment. The precautionary principle springs from this understanding of the nature of human knowledge about the environment. Ecological economists (Costanza et al, 1997: 147) believe that the real challenge is to develop scientific methods to determine the potential costs of uncertainty, and to adjust incentives so that the appropriate parties pay the cost of this uncertainty and have appropriate incentives to reduce its detrimental effects.

In keeping with the concerns of ecological economists about scientific uncertainty and economic decision-making, they are also skeptical of the technological optimism of neoclassical economics. (Costanza et al, 1997: 148) Neo-classical economics assumes that any limits to energy or resources will be overcome by new technology. Ecological economists on the other hand do not assume that technology will always be able to circumvent fundamental energy and resource constraints and they maintain that eventually the increased production of goods, i.e. economic growth, will have to stop. Ecological economists, like ecologists, maintain that natural systems should stop growing otherwise they become unhealthy and "cancerous".

Ecological economists (Costanza et al, 1997: 149-151) are prudent in their regard for technology. They do not disregard technology, only they wish to err on the side of caution. In this way, by employing low-impact technologies and adopting policies that are technologically skeptical and that reduces the impact on the environment, society still wins if their predicted ecological limits are not reached.

However, if caution is not followed and technologically optimistic policies are followed that allow the blatant transgressing of well-understood ecosystem limits, the results could be wonderful or absolutely disastrous. Ecological economists

therefore prefer to hedge
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their bets. This technological skepticism is criticized by moral philosophers like Sagoff, who support the view that as long as knowledge advances the economy can expand. Sagoff (2004: 156, 157) is confident that knowledge and ingenuity will alleviate resource shortages. Citing neo-classical economists, he states that the more advanced the technology, the more reserves become known and recoverable. Secondly, he maintains that as technology advances and resources become scarce, society is able to substitute some resources with others. Thirdly, the power of knowledge continually reduces the amount of resources needed to produce goods.

However, I believe that the skepticism of ecological economists towards technology is warranted. While technology is able to get us out of many resource fixes, the question remains, do we necessarily always want to live in the reality that these resource substitutions will create? Are we willing to live with sacrificing wetlands for industrial plants or shopping malls for forests? Are we willing to substitute untouched dunes with restored dunes from uranium mining? The application of new technology is not a value free exercise. New technology or new production processes create opportunities; however, they could also potentially give rise to new environmental ethical problems. One could ask, for example, what kind of impact will the extraction of minerals from sand dunes have on the dune plants in an area? Would some species be detrimentally affected by the process? When new technologies are applied in a practical situation they need to have been preceded or accompanied by ethical deliberation regarding potential areas of moral concern. These ethical deliberations could also serve to shape and inspire new technologies, some of which may enhance rather than degrade the environment.

4. Issues of the distribution of resources

The distribution of resources is another key issue in ecological economics. Distribution refers to the division of the flow of resources, that is, how goods

and services are divided among people.

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Neo-classical economics is not explicit about the normative issue of how goods and services are distributed among present generations, except indirectly through taxes and welfare, whereas ecological economics is not only concerned about the justice of current resource allocation among present generations, but also takes a longer term view and asks how resource equity should be maintained between present generations and future generations. (Costanza et al, 1997: 70, 81, 82; Daly and Farley, 2004: 268, 269)

In traditional neo-classical economics, the current distribution of resources is accepted as a fait accompli. The prime aim of the market is to ensure that those with the ability to pay can satisfy their individual desires. The fact that there could well be people who have nothing and some that have more than they need is ignored. Equity in the allocation of resources is restricted to the fact that no one is made worse off by the exchange when someone else is made better off. Just how well off some people were in comparison to others initially, is not considered. Nor is the effect that this imbalance has on the general health, security and stability of a community a consideration. (Daly and Farley, 2004: 259, 267, 268) Neo-classical economics deftly sidesteps the issue of the equitable distribution of natural resources, by focusing on the growth of the economy. As long as people are able to access more resources and services, the link between poverty and the fact that some people have more than they need is not made. The philosophy of neoclassical economic is to grow the economy to provide for people, so they can avoid the political difficulties of redistribution. (Costanza et al, 1997: 70)

Ecological economists point out that neo-classical economics makes normative judgements about distribution implicitly. (Daly and Farley, 2004: 261) Interpersonal comparisons between different people's utilities are not considered. If interpersonal social utility was considered then the total social utility could be increased by

redistributing a low utility rand from a wealthy person to a poor person, automatically transforming it into a high utility rand. By denying interpersonal comparisons, neoclassical economics creates a highly individualized society that is contrary to the way humans are influenced by others and operate in community.

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Ecological economics not only focuses on the distribution of resources within a generation but also sees intergenerational distribution as an ethical issue. (Daly and Farley, 2004: 269) Their argument unfolds follows like this. "There is, therefore, no moral justification for claiming that one generation has any more right to natural resources, the building blocks of the economy, than any other. At the very least, future generations have an inalienable right to sufficient resources to provide a satisfactory quality of life. The current generation thus has a corresponding duty to preserve an adequate amount of resources. What is adequate depends on the technology and ecological change, both of which are characterized by pure uncertainty (ignorance)." (Daly and Farley, 2004: 269)

Ecological economists make a distinction between renewable and non-renewable resources. They advocate an upper limit for the use of non-renewable resources determined by the waste absorption capacity of the environment. They state that the use of exhaustible resources by one generation should not reduce renewable natural capital for the next generation. Non-renewable resources should be recycled where possible. If a generation is dependent on non-renewable resources then they need to develop substitutes for the next generation. (Daly and Farley, 2004: 270)

It is recommended, for example, that the World Bank, which is an important global institution for economic policy, should begin to require that their projects meet important criteria. The projects would need to consider Costanza's (1991: 16) three guidelines for the exploitation of resources: that is, that resource use should take into account the regeneration capacity of ecosystems as well as the ability of ecosystems to absorb waste

material. Moreover, non-renewable resources should only be depleted if human ingenuity is able to supply future generations with substitute resources.

Ecological economics is critical of the fact that neo-classical economics discounts the future. The discounting of the future is standard business practice and neo-classical economists argue that all people automatically do this when making choices. They therefore argue that the market efficiently allocates goods and services between the

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present and future. Daly and Farley (2004: 271) point out that people value present satisfaction more than they value future satisfaction, for example, they prefer to borrow money today and pay back with interest in the future. There could be many reasons why people prefer to have goods and services or money today: uncertainty about the future or they might expect to be richer in the future or they might feel that if they do not spend money now they could lose out on an opportunity that will not be there in the future.

A high discount rate favours projects that have low present costs and large present benefits and they might have high future costs and small future benefits. A high interest rate on the other hand, discourages spending and therefore reduces Gross National Product and ultimately the exploitation of the environment. (Daly and Farley, 2004: 272)

In terms of environmental concerns, a high discount rate usually means immediate intense exploitation of a resource. Nuclear energy is a clear example of this. There is enormous short term interest in spending capital and labour on building a nuclear power plant for cheap pollution free energy and large risk for future generations who inherit the spent radioactive nuclear fuel.

Ecological economists agree that individuals may have a present time preference but they make the point that the same logic does not apply to society. While individuals have a short life span and a short term interest, society has a longer life span and fewer uncertainties to face. Daly and Farley discuss a concept called the "social discount rate"

which they describe as “a rate of conversion of future value to present value that reflects society’s collective ethical judgement as opposed to an individualistic judgement, such as the market rate of interest.” (Daly and Farley, 2004: 275) It is lower than the individual discount rate. To illustrate the point, Daly and Farley use the example of how an individual would be reluctant to pay for measures to prevent global warming because it is unlikely to affect them but future generations. Society on the other hand would spend money on preventing global warming because it is in society’s long term interest.

In conclusion, on the issue of distribution, the concern of ecological economics about ecological limits makes them less willing to pursue growth and more favourable towards
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addressing equity through redistribution. (Costanza et al, 1997: 148, 70, 71) This is because they believe that there are limits to economic growth within a finite ecosystem and so the vast differences in environmental and economic resources between rich and poor have to be addressed. Ecological economists are of the opinion that sustainability requires intergenerational and intragenerational redistribution and therefore moral discourse is inevitable for sustainability.

In the above discussion, I have assessed how effective neo-classical economics was at expressing environmental values and goals in terms of market prices and, how effective it was at attempting to incorporate environmental concerns into economic thinking through Pigouvian taxes (by including the cost of pollution in production) or Coasian property rights (by creating a market for pollution). This kind of approach amounts to a costbenefit analysis of all environmental resources within the economy by reducing them all to a single scale, the scale of human preferences as quantified in monetary terms. (Edwards-Jones et al, 2000: 84). If goods and services do not have a monetary value then derivative prices are created for them, through a variety of methods. Once everything is on a monetary scale, the costs are added and the benefit calculated. Everything in the environment is valued according to how it interests paying

individuals who have a desire for a particular environmental good or service in the present time.

Using the insights of ecological economists, I was able to show up some of the shortcomings of measuring environmental costs and benefits in terms of short-term consumer preferences. I discussed how consumer preferences differed from consumer welfare, how scientific uncertainty made it difficult to effectively cost environmental resources and how finite natural resources required one to look at the scale of the economy as well as the ethical distribution of natural resources both within current generations and future generations.

Ecological economics attempts to fill some of the gaps in economics by introducing interand intragenerational equity, ecosystem limits, a social discount rate and the precautionary principle to cope with scientific uncertainty.

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However, I will discuss in the section that follows how, despite these insights, ecological economics remains unable to effectively include environmental considerations into economic decision-making.

Ecological economics shares some common ground with the emerging field of institutional economics that is also critical of neo-classical economics. Institutional economics is critical of neo-classical economics' ignorance of the role of institutions in allowing the market mechanism to function. Institutional economics claims that neoclassical economics is ignorant of how markets themselves develop within economies, i.e., the institutional and historical contexts that allow or disallow the success of markets. (North, 1993) Institutional economics makes the point that institutions are important because they determine economic performance. North states that institutions, along with technology, define the transaction and transformation costs that together add up to the costs of production within the market. The market only functions efficiently when transaction costs are zero and this seldom occurs. Institutions affect transaction costs in the market place and cannot be ignored by neo-classical economics. This argument is potentially useful for ecological economics to take on board because it provides an

insight into how the above-mentioned failings of the market mechanism could be addressed, i.e., through creating institutional arrangements that address the context in which the market operates. 6

D. Critical comments on ecological economics

Ecological economics, as the name implies, seeks to broaden the vision of the individual consumer to include ecological concerns and looks to the science of ecology to provide an understanding from which to achieve this. Ecology has a number of criteria at its disposal with which it evaluates ecological goods and services. However, it is often difficult to decide what criteria are appropriate in economic decision-making.

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This conversation between ecological economics and institutional economics has started. See Greenwood, D.T. and Holt, R.P.F. 2008. Institutional and Ecological Economics: The Role of Technology and Institutions in Economic Development. *Journal of Economic Issues* 49 (2), June.

<http://web.ebscohost.com.ez.sun.ac.za/ehost/pdf?vid=3&hid=3&sid=649c92c0-25da-408a-a1ca5ee42a5e5548%40sessionmgr9> [22 February 2009].

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For example, heather moorlands are naturally species-poor but are considered aesthetically desirable. Coastal mud flats, on the other hand, are visually unattractive but are rich in invertebrate species which provide valuable food for wading birds. EdwardsJones et al (2000: 98-101) point out that if only one or two criteria were universally adopted for use in conservation evaluation, then many areas of land would not be protected. A closer look at one criterion, species population, illustrates the difficulties. The Red Data Books of the International Union for Conservation of Nature and Natural Resources (IUCN) is an example of an attempt to identify threats to species. There are eight different categories ranging from extinct to endangered to not evaluated. While there is some scientific basis to the criteria, like actual quantities of numbers, subjectivity creeps in when deciding what the appropriate level of each species is. Is the number of a

1000 of a rare bird species the equivalent to a 1000 cheetahs or should individual cheetahs have more value?

Assessing the conservation priorities for habitats runs into the same kind of problems. How is it possible to develop a multi-attribute method for evaluating conservation value? Some of the problems with developing a "multi-attribute" method for evaluating conservation value are shown by an examination of the comparative biological value index that uses the following criteria: size, physicochemical features, optimum populations, diversity, geographical limits, purity, education and research use, combinatory value and unknown factors. (Edwards-Jones et al, 2000:104-106) Each criterion is given a score and then added together. However, because not all criteria are valued on the same scale, a weighting of criteria automatically occurs. Some criteria are considered more important than others. There have been various attempts to improve on this, using computer-based evaluation systems. This computerized analysis attempts to include the subjective choices within a transparent and repeatable framework. While this ultimately makes the subjectivity of the choices more explicit, it does not resolve the problem of the purely subjective nature of the assessment of criteria itself.

This problem is compounded when these ecological tools of evaluation are brought into economic decision-making. Not only is one faced with multi-attributes within ecological

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systems, but these multi-attributes are added to the multiple and individually varied economic needs that people have for food, shelter and recreation. One is confronted with a juggling act where there are too many variables and no "objective" way of deciding what the appropriate mix of ecological or economic attributes is that is necessary to describe a good "quality of life". The quality of life for a particular habitat or ecosystem to flourish might mean that certain human preferences for shelter or food in society might need to be foregone. While this might be easier to achieve on an individual basis, the real

question is how this is achieved on a macro-economic scale.

One of the arguments against traditional neo-classical economics is that it reduces citizens to consumers in the market place. (DesJardins, 2006: 64) When value is restricted to market analysis as defined by individuals satisfying their preferences, one ignores the public realm and the fact that human beings are also citizens with long term views on how society should be. In real life values are not cast in stone but exchanged and debated. Society is able to mutually define the vision of the good life through debate and discussion. DesJardins (2006: 65) writes: "A healthy, beautiful, undeveloped and inspiring environment may not benefit me as a consumer but it may be quite valuable to me as a citizen."

How does one decide objectively what mix of ecological and economic needs are appropriate for the quality of life of the citizens of a country or citizens of the planet? Ecological economists, when making these value choices, often revert back to valuing ecological systems on a monetary scale. They ascribe certain monetary values to ecosystem functions.

This in itself is no simple task (Edwards-Jones et al, 2000: 112, 113, 114, 117) because some ecosystem services provide more than one service to human beings, for example the decomposition of organic waste removes waste and provides nutrients for plants. Other ecosystem functions combine to provide a single function. The successful growing of crops, for example, depends on a number of ecosystem services like good soil, water and sunlight. Good soil is a combination of earthworm activities and micro-organisms

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producing nutrients combined with effective hydrological cycles and adequate sunlight. Attempts have been made to place a monetary value on these ecosystems services and include them in economic calculations. One such calculation completed by Costanza and colleagues estimated that the values of all the services provided by all the ecosystems of the world combined summed up to between \$16 and \$54 trillion per

year, with an average of \$33 trillion per year. (Costanza, d'Arge, De Groot, Farber. Grasso, Hannon, Limburg, Naeem, O'Neill, Paruelo, Raskin, Sutton and Van den Belt. 1998: 1)

This attempt to combine ecological systems of evaluation with economic valuation by placing monetary values on ecosystem services have been useful in demonstrating the interconnectedness of the human and natural world. It has assisted in developing an economic argument for plant or animal species that might not have any immediate conservation status for human beings but nevertheless perform important ecosystem services for human survival. (Edwards-Jones et al, 2000: 117). However, while this method of analysis has drawn attention to the economic value of the environment in a generic sense, the actual practice of valuing the environment in monetary terms in specific instances can result in inconclusive results. The contingent valuation method where a focus group of people are asked what they are willing to pay for an unpolluted habitat can be highly subjective. It would depend on questions that are posed to those respondents. This might vary not only between participants but also for each participant, depending on their specific situation at any point in time.

Another point of criticism is that it is not really possible to describe in monetary terms the value of clean air or drinkable water, much like it is impossible to work out in monetary terms what the value of one life is. There is something ridiculous about claiming that the earth's natural systems are valued at \$33 trillion a year because without these natural systems we would cease to exist. Moreover, it is entirely fictitious in the sense that we would never be able to pay it out because we would never survive the exchange happening.

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One could also argue, as Sagoff (2004: 144, 145) does, that ecological economists overlook the fact that nature is not always a benefit but it sometimes provides a disservice or a huge cost to society. One just has to be reminded of the devastation caused by

hurricanes and earthquakes. Moreover, Sagoff believes cost-benefit analysis can never fully protect nature and that if one wants to save pristine places from destruction, one needs to use other arguments like spiritual arguments or intrinsic value to protect it. Sagoff states: "To argue for environmental protection on utilitarian grounds – because of 'carrying capacity' or 'sources of raw materials' and 'sinks for wastes' – is therefore to erect only a fragile and temporary defense for the spontaneous wonder and glory of the natural world." (Sagoff, 2004: 176)

Sagoff is skeptical of many of the principles of ecological economics. He is of the opinion that one of the central principles, carrying capacity, is unable to prove that economic growth is unsustainable. This is because he sees the concept of the carrying capacity of the earth as an elastic concept that depends on the socio-economic practices of people rather than something that exists concretely in the environment. Moreover, he believes that human knowledge and ingenuity can substitute resources and do away with scarcity. Sagoff's technological optimism also leads him to ask the question: what if technology was able to take away all the instrumental uses of nature? (Sagoff, 2004: 174-176).

In this thesis, I agree with Sagoff that using the market mechanism of price to protect the environment is insufficient, but my reasoning differs from his. Whereas Sagoff is skeptical of the value of some of the concepts of ecological economics, I believe that in some circumstances the carrying capacity of the environment might, indeed, present a problem for certain economic activities. It would be unwise, for example, to embark on heavy industry in an ecologically sensitive area that was already experiencing the loss of biodiversity. The carrying capacity of the environment is influenced by our socioeconomic practices, but this does not mean that the possibility of irrevocable damage to ecosystems and subsequent extinctions can be ruled out.

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Ecological economics is mindful of these limits and in theory first tries to estimate what

the parameters are before allowing market choices free play. Ecological economists may miscalculate these parameters from time to time and the parameters may be adjusted depending on technological advances that result in different industrial practices. However not, to do these kinds of calculations would seem irresponsible. Neo-classical environmental economics on the other hand does not think these calculations are necessary and prefers instead to tackle the issue through the market mechanism by factoring environmental pollution into the price of products. This I believe is foolhardy. Our human bodies and the environment have certain critical limits that need to be respected so that these biological systems do not collapse.

Moreover, I rather would like to err on the side of caution, along with ecological economists, when they fear that we might not be able to solve all scarcity issues with new technological breakthroughs and human ingenuity. In my opinion, there is no logical reason why, just because we have solved scarcity problems in the past through finding alternative resources, that we will be able to solve them in the future. This is wishful thinking rather than a logical argument.

I agree with Sagoff (2004: 176), however, that it is insufficient to protect the environment on utilitarian grounds. Utilitarian value, especially if it is defined in terms of the exchange values of the market place, just tell us what people would be willing to pay for that environmental commodity at that point in time, based on their limited perception and possible self interest.

Any environment protected on this basis is on shaky ground. Ecological economics tries to make exchange values better reflect actual use value by including ecosystem limits and the value of environmental services. Their efforts in some instances do allow the price of environmental goods and services to better reflect actual use value. However, use value as a form of consequentialism that holds that the right or wrongness of an action is based solely on the consequences of performing it, also has limitations. (Brody and Fogelin, 1983: 10, 18-20) Firstly, utilitarianism ignores any special obligations that one may have

to people, because it calls us to weigh our different obligations to people equally. One may have special obligations to family members, friends and individuals to whom we have made promises. These obligations may cause one to put aside considerations of price, because there is a different type of value at stake. Secondly, in utilitarianism there is a lack of emphasis on individual rights meaning that if the consequences of an action are favourable to most people concerned, it would be supported regardless of whether this disregards the individual rights of someone. A third point of criticism against utilitarianism is that it requires a certain level of ingenuity to make sure that one has considered all the feasible alternatives. When calculating the consequences, one always has to make allowances for uncertainty. Therefore the decision-makers have to be satisfied with statistical probabilities rather than known facts. Lastly, when assessing the consequences, the decision-maker must deal with the fact that some consequences are good for some people and bad for others. It is not always clear how one can weigh the gains for some against the losses for others.

However, some people might actually defend utilitarianism as an important criticism against common morality of a society. By linking ethical theories of principles and rights to issues of utility one could uncover irrational prejudices within society. There may be some moral rules in a society that are irrational, like for example sexism where it is claimed that men should be treated differently to women because they are inherently superior. Linking this principle to the amount of unhappiness it promotes, is useful in measuring the overall utility in situations. (Rachels and Rachels 2007: 115) I propose that while utilitarianism as an ethical theory shows obvious flaws, when used in conjunction with other rights based and virtue theories raises some important ethical considerations. However, it is not the focus of this thesis to go into a detailed discussion of utilitarianism per se, but rather to raise the concern that ecological economics remains wedded to a certain version of utilitarianism that is too limiting and that

facilitates the degradation of the environment within the economy.

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It could be argued that neo-classical economics has adopted an extreme form of utilitarianism known as hedonism. Some environmental ethicists like Norton (2003: 187) suggest that the concept of "consumer sovereignty" that is employed in neo-classical economics is a form of hedonistic egotism rather than utilitarianism. Neo-classical economics follows Bentham theory that individuals are the best judge of their own well-being and that expressed preferences should be accepted at face value.

Norton writes that this view was later rejected by a later utilitarian, John Stuart Mill, who argued that there is an important difference between higher and lower satisfaction i.e. that preferences that are mindful are better than ones that are based purely on the sensual pleasure. Norton is of the opinion modern consumer sovereignty still throws its weight behind Bentham.

Ecological economics, with its emphasis on scale, ecological limits and redistribution, on the other hand, is not a form of egotistical hedonism but a much more sophisticated or "evolved" form of utilitarianism that takes into account longer term interests and utilities, not only individual preference satisfaction.

However, when ecological economics

attempts to prioritise environmental values it does so by attempting to quantify environmental value on a monetary scale. This is a reductionist enterprise that reduces environmental value to market-related exchange values. This amounts to valuing the environment in terms of the short term consumer preferences of neo-classical economics that are focused on immediate gratification.

The long term considerations of the

environment are then discounted in terms of larger, more immediate short term gains. Longer term sense-of-place values and ecosystem concerns are left

unidentified,
rendering ecological economics inadequate as a comprehensive
approach to economic
decision-making about the environment.

What is needed is an economic approach to environmental concern that
is able to engage
with the priceless value of clean air and water, instances of
ancestral claims on the
environment, as well as intrinsic and inherently subjective
expressions of environmental
value.

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Has ecological economics been able to offer a different approach
that will be able to
address these diverse values within economic decision-making?

My answer to this

question is negative. While ecological economics has helped to place
the economic
decision-making within an ecological context and in so doing has
shown up some of the
impacts of unexamined consumer sovereignty on the environment with
concepts like
carrying capacity and ecosystem limits, it remains flawed and unable
to address the
complexity of values that govern the relationship between human
beings and their
environment in economic decision-making. This is because despite its
protestations about
ecosystem limits it often falls back on the crude measuring tool of
neo-classical
economics, the market place, to prioritise environmental value.

Environmental impact assessment, the favoured tool of analysis of
ecological economics,
is an attempt to move away from crude monetary evaluation.
Environmental impact
assessment recognizes that a range of economic, environmental and
social impacts are
likely to be associated with a development project. It differs from
the cost-benefit
analysis of neo-classical economics in that it measures various
impacts by different
criteria. (Edwards-Jones et al, 2000: 139, 143, 144) The financial
costs and benefits that
are measured in terms of money are included along with the aesthetic
and the social.

The existence of these different data types like financial benefits,
ecological costs and

social benefits have caused Environmental Impact Assessment practitioners to become creative with definitions of a concept, like "significant impact". They use a variety of criteria to describe the concept like: frequency, duration and geographical extent of the impact (a frequent, long lasting impact that affects a wide area is obviously worse than an infrequent, short event that covers a small area); reversibility (impact that causes an irreversible loss obviously highest); the possibility of mitigation (if you can reduce the impact it is less important); social or political acceptance (if it is socially highly controversial then it has high impact); pre-established legal limits (is the activity legal?); and future similar developments (are there likely to be more impacts of the same kind?).

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Edwards-Jones et al (2000:146, 147) discuss how ecological economics uses tools like the Leopold matrix and Environmental Evaluation Tool to try and evaluate diverse criteria. The Leopold matrix was set up by a group of experts who list a row of environmental attributes like soil nutrients, flora and fauna on one axis and construction operations on another axis. The impact of the construction activities were valued according to magnitude and importance separately where ten indicates the highest score. For example the building of a road could have an 8 for magnitude of impact on soil stability and a four for the environmental importance of the impact on soil stability. The Environmental Evaluation System is another tool. It lists the quantity of an environmental attribute that is desirable, for example: tree cover at 55% might be desirable in Scotland. The variety of environmental attributes like percentage of tree cover, or surface area covered by water that are likely to be affected by a development, are then also rated for importance. Together the desirability rating and the importance rating of the desirability attribute are combined to form environmental impact units.

While Environmental Impact Assessments and the tools they use are attempts to address value differences in environmental decision-making, they struggle to develop a method of

prioritizing certain values above others. Sometimes, they fall back onto a money-based cost-benefit calculus, sometimes they attempt to develop complicated repeatable formulae and other times it amounts to kind of a description of differences with no real prioritization of values. While a description of differences or a division of environmental concerns into environmental impact units can bring one to an awareness of the different ways in which people value different environmental attributes, it cannot resolve what lies at the heart of these differences – different ways of valuing the environment. In order to resolve these kind of deep-seated differences that inevitably result in emotional clashes or stalemates in environmental impact assessments, one needs to investigate how to address intrinsic and instrumental value simultaneously. Merely quantifying the differences or describing them will not move one to an effective resolution.

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Social impact assessment, a separate though integrated part of Environmental Impact Assessments, brings this point even more into focus. In Strategic Impact Assessments questions are posed like: Are the biological needs of human beings more important than their psychological needs or political rights? Edwards-Jones et al (2000: 150) highlight 10 different human needs ranging from biological and psychological needs to transport and entertainment. How to go about weighing up the positive and negative social impacts of a development in terms of the variety of human needs is a complex exercise. It is also often a highly politicized process and it requires direct public participation. It is in these public participation meetings where the deep-seated value differences that underpin these different interpretations of "significant impact" become apparent.

E. Conclusion

The above discussion leaves economic decision-makers a choice between two options: it can either disregard the criticism of environmentalists of current economic forms of evaluation or it can take them seriously and attempt to engage with the diversity of environmental values that are implicit in economic decision-making.

However, the question is how do you engage with this diversity without ending up adopting a form of moral relativism or a position of anything goes (DesJardins, 2006: 261, 262) In 2002, I was part of a two-person research team who conducted an opinion survey on the ethical considerations in environmental decision-making in Cape Town and surrounds. Many of the 89 participants in the survey did not understand that people could value the natural environment in different ways, and that people could have differing conceptions about how to formulate, implement or enforce environmental legislation and complex concepts like sustainable development. (Seeliger and Hattingh, 2004: 54)

In a follow up workshop with government officials in 2005, where we started to explore the various ways in which people value the environment or interpret concepts like development, progress and environment, officials were surprised by the deep-seated value differences that existed.

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In the survey itself just how differently people reacted to two statements from a table presented in the survey (Seeliger and Hattingh, 2004: 53, 54, 55) showed how divergently people value the environment. One statement read: "It is impossible to place an economic value on biological diversity". A total of 16% of respondents strongly agreed, 20% agreed, 11% were neutral, 39% disagreed and 14% strongly disagreed. The second statement read: "Natural life is valuable, regardless of its use for human beings." A total of 45% strongly agreed, 28% agreed, 7% are neutral, 14% disagreed and 6% strongly disagreed.

This divergence of values is despite the demographical profile of the sample of 89 people showing that there was not a huge discrepancy in the education or economic background of the participants. The demographics show that 40% were government officials, 24% were researchers, 10% were consultants, 8% were activists, 12% were developers and 6% were politicians. A total of 92.4% of the respondents indicated in the questionnaire that

they had tertiary education. (Seeliger and Hattingh, 2004: 13, 14)

The difference between strong or moderate support for a particular value position, like intrinsic value or instrumental value for instance, can lead to serious debates among roleplayers in environmental decision-making about which policy or course of action to choose. (Seeliger and Hattingh, 2004: 53) In the two statements discussed above, it is clear that sharp value differences existed even in this small sample size with a fair amount of common background among the participants. The differences in value positions would have been even more acute if the broader public had been involved in answering the questionnaire.

In economic decision-making, because of the dominance of monetary evaluation and/or cost-benefit analysis, other ways of valuing the natural world like intrinsic value have been disregarded. Ecological economics has gone a long way to showing how the dominance of an exchange value approach can impact sometimes irreversibly, and not always favourably, on the environment. However, ecological economics with its focus on quantifying and calculating impacts on the environment and working out the significant

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costs of ecosystem services to humankind, though sensitive to ecological concerns, is ultimately often ends up relying on the very mechanism which it criticizes so effectively – the market.

In the chapter that follows, with the help of Bryan Norton's environmental pragmatism, I will show how ecological economics, in order to be able to include the full breadth of environmental values in economic decision-making, needs to adopt a morally pluralist approach to environmental valuation. I take up Norton's suggestion that it is not only economic thinking that has to change, but also theories of environmental value, in order to allow economic considerations to be included in environmental evaluation. I show how this is achievable by examining the debate within environmental ethics concerning how to prioritise multiple environmental values.

CHAPTER TWO:
DEVELOPING AN ENVIRONMENTAL ETHIC FOR ECONOMIC DECISIONMAKING

A. Introduction

In the literature of environmental ethics there is much lively debate about how to deal with the diverse and sometimes clashing ways of valuing the environment. Individual environmental ethicists approach the relationship between human beings and their environment with many different lenses. This has led to a number of dualisms emerging in the field including anthropocentrism versus non-anthropocentrism, individualism versus holism, the intrinsic value of nature versus the instrumental value of nature and moral monism versus moral pluralism. (DesJardins, 2006; Hattingh, 1999; Light 2002a)

It is important to note that it is not my explicit intention in this thesis to present a complete argument for why environmental pragmatism is better than biocentrism, ecocentrism or deep ecology as an environmental ethic. Instead, my aim is show how environmental pragmatism assists in the development of a methodology for including environmental concerns in ecological economic decision-making. My argument for adopting an environmental pragmatist approach in economic decision-making is therefore a methodological one. 7

The argument in the previous chapter was that ecological economics was unable to accommodate the full range of environmental values within economic decision-making. In this chapter, I discuss how ecological economics could overcome this impasse by adopting a morally pluralist approach. In order to unpack the implications of this move, I discuss the debate in environmental ethics between moral monism versus moral pluralism.

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Andrew Light makes a case for adopting a methodological pragmatism in an article entitled A Modest Proposal: Methodological Pragmatism for Bioethics. (Light, 2002b:

In order to examine the implications of adopting a moral pluralist approach in ecological economics, I compare an extreme form of moral pluralism, as found in the writings of Stone, with a more moderate form of pluralism, as found in the work of Callicott. 8

I argue for moral pluralism because it is an approach to environmental ethics that could assist economic decision-making in making space for intrinsic values alongside exchange values. I discuss how the philosophy of pragmatism, that acknowledges the constructed nature of reality and morality, is able to offer economic decision-makers the experiencebased experimental approach to economic decision-making that is needed to allow for this multiplicity of environmental values.

Bryan Norton's environmental pragmatism is chosen because it one of the most advanced forms of environmental pragmatism with regards to the relationship between economic decision-making and environmental ethics. Norton's understanding of environmental pragmatism is especially useful in identifying and describing the gap between the way in which economic decision-making values the environment and the way in which environmental ethics values the environment.

I explore how Norton's version of environmental pragmatism overcomes this divide through its emphasis on the process of value formation and the seeking out of common goals and experimental development paths. I demonstrate how Norton's three adaptive management guidelines assist in developing a methodology for including environmental concerns in economic decision-making that goes beyond present decision-making models like game theory and multi-criteria decision-making towards an interactive, iterative social learning process that combines a contextualised approach to truth with an experimental approach to knowledge formation and a multi-scalar approach to time.

It should be noted that Callicott himself refers to himself as an ethical monist but agrees that he is not opposed to interpersonal pluralism. (Callicott, 1999:169; 181-183)

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B. Making a case for moving beyond moderate pluralism

In this section, I begin with a discussion between Stone, Wenz and Callicott about the merits of moral monism and moral pluralism to demonstrate the value of a pluralist approach. I discuss how economic decision-making requires a form of pluralism to allow for the full range of environmental values to be considered. I then proceed to argue that a form of moderate pluralism, as proposed by Callicott, is insufficient as an approach to helping ecological economics towards including environmental concerns in economic decision-making.

Stone (2003: 195, 196) describes moral monism as an attempt to defend the preservation of a forest or the protection of a laboratory animal under the same single overarching principle or coherent body of principles. This principle or group of linked principles is expected to guide us through all moral dilemmas to the one right solution. It is understood, using the example of moral sentience as a value that either something has the quality, for example sentience and therefore is morally considerable, or it is not, and therefore is not considered. Many environmentalists feel uncomfortable with this form of moral reasoning because they might, for example, experience an ecosystem as having value but are unable to assert its moral right because it is not strictly speaking sentient.

Rather than positing only one approach to moral reasoning, Stone states that the same person might decide to adopt two different moral approaches in different circumstances. A person might decide to adopt a utilitarian approach when deciding between which two fruit trees to buy for a garden, and then a virtue-based approach when deciding between the choice of two business partners. He states it is because of the variety of things that we encounter as humans that we need to take into account different criteria in different

situations. There is a case to be made for valuing something for its higher intelligence (or sometimes for sentience) or sometimes we value a group rather than an individual species. (Stone, 2003: 197–199)

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One might value human beings as individuals but value bees in a unit like a hive and plants from the perspective of an ecosystem. The characteristics that one would consider would differ in these circumstances; for example, with individual species of animals one might consider characteristics like intelligence and the ability to feel pain. Alternatively, if one were considering ecosystems one would look at characteristics like resilience, stability and uniqueness. We might think it silly to express our viewpoints or actions for a lake in the same way as we would express our judgements or actions for a person. The same rules do not necessarily apply. (Stone, 2003: 198, 199)

Stone (2003: 197) argues that: “Moral pluralism refuses to presume that all ethical activities (evaluating acts, actors, social institutions, rules, states of affairs etc.) are in all contexts (in normal interpersonal relations, across large spaces and many generations, between species) determined by the same features (intelligence, sentience, capacity for emotions, life) or even that they are subject, in each case, to the same overarching principles (utilitarianism, Kantianism, nonmaleficence etc.)”.

In trying to decide an ethical case, Stone (2003: 200) suggests we formulate a lexical ordering rule. He suggests that our obligations to neighbours could be determined on a framework built on neo-Kantian principles. These might claim priority up to a point where our neighbours have reached a certain level of comfort and protection. When that level has been reached, considerations of species preservation as determined by another framework would be considered. In this “lexical ordering rule” some principles in certain situations claim priority over others. Our obligations to our neighbours have priority up to a point where they reach a certain level of comfort and protection, thereafter the preservation of species or future generations might become

important. Stone does not see this as falling back on monism or a single principle because one starts off with looking at a single situation in a variety of moral ways with differing solutions. If one introduces a master rule it is only after these different solutions have been produced. These differing solutions might not have arisen had these differing approaches not been embarked on.

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Stone (2003: 200, 201) states that when no lexical rule is available and when no "best of all" solution is found, this does not mean that we should abandon the total system of beliefs, rather it means we just have to admit that it does not work for this particular case. It is not fatal to a system of moral rules if it is not able to always give us an answer. Perfect consistency and one right answer to every moral quandary are not always possible. One should rather ask the question: What exercise in moral decision-making provides one with the best answers that reason can provide? (Stone, 2003: 201)

However, this approach to moral decision-making is not acceptable to all. Baird Callicott (1999: 147, 155) accuses Stone's version of moral pluralism of inviting moral promiscuity where one chooses the theory that best suits one's interests in a situation. He states that it invites one to adopt different moral theories to suit different situations. You could use one moral theory to inform your relations with friends, another with family and a third with non-humans. These different moral maps when put together, result in inconsistent and contradictory results rather than providing greater clarity.

Callicott states: "The overall structure of *Earth and Other Ethics* does not give one much comfort about the worry that moral pluralism might provide a sophisticated scoundrel with a bag of tricks to rationalise her convenience or self-interest – rather than a box of tools to work her way through the moral complexities of life in the late twentieth and early twenty first centuries." (Callicott, 1999: 155)

Callicott (1999: 157, 159) is of the opinion that contradictory

moral theories are indicative of the need for deeper moral reasoning about the structures of human thinking. One needs to articulate the worldview of all these different theories and throw out the metaphysical tools that centuries of experience and critical thinking have invalidated. It is Callicott's view that ethical theories like utilitarianism and Kantianism carry with them metaphysical assumptions that contradict a relational sense of self that is understood within an ecological understanding of human nature.

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In the ecological understanding of human nature, human beings are part of the natural world not separate or distinct from it. Utilitarianism, on the other hand, is based on an individual isolated self that buys into a Cartesian world view with a split between subject and object and alienation of the self from the external world. Moreover, Kantianism sees human nature as being defined by reason and this also sets humans apart from nature.

Callicott (1999: 160, 161) sees Stone's form of moral pluralism, where you are able to move from one ethical theory to another, depending on the moral context as a form of "metaphysical musical chairs" that is inconsistent. While Callicott, like Stone, is not searching for an ultimate truth he believes that we should continue to endeavour to develop comprehensive environmental philosophies. He is unhappy about the connection between moral pluralism and deconstructive post-modernism. He believes that any postmodernist fears of totalising outlooks that try to exert control over people are misconstrued in environmental ethics. Callicott sees the Ecosophy T or Ecosophy S of Deep Ecology as attempts to move environment philosophy beyond the deadness of modernism rather than attempts to exert control. They are merely presenting a worldview that is keeping up with human beings' growing body of knowledge.

Callicott (1999: 157) sees the task of philosophy in the post-modern era as being one of getting rid of unuseful metaphysics and building a new metaphysics from the ground up. While one cannot be sure what modernity's successor will be, one should remain

cautious, however, that does not mean that one has to be exclusively deconstructive and build no new master narratives. His criticism of deconstruction reads: "We don't just need a new metaphysics, they (that is deconstructivists) seem to think, we need to get off the metaphysics treadmill altogether; we don't just need to re-organise our worldview – to respond to and accommodate fundamental changes in natural philosophy – we need to see (oops, realize, rather) that a 'view', a 'vision' of any sort is a Modernist hang-up." (Callicott, 1999:163)

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Callicott (1999: 166–168) is of the opinion that we need a comprehensive vision that is in agreement with our existing bodies of scientific and ethical knowledge. A unified vision like this enables us to rationally select among or balance out the inconsistent demands made upon us in the multiple social, interspecies and ecosystemic relationships we find ourselves in. He believes, even more importantly, that a unified worldview gives our lives purpose, direction, coherence and sanity. Callicott develops such a world view using Leopold's "community concept" and Darwin's communitarian moral philosophy.

He interprets Darwin as having shown that the sentiments of sympathy and affection were naturally selected in mammals as a device to ensure reproductive success. The mother in whom these instincts were strong, more successfully reared her offspring, and these affections later extended to fathers, siblings, grandparents and uncles, etc. Human beings thus evolved into highly social primates in a complex social matrix. With speech and capacities for abstraction, human ancestors began to codify their behaviour and called concordant behaviour good and discordant behaviour evil. Callicott believes these primitive clan or tribal communities have not disappeared but remain intact encircled by larger communal spheres.

Evolving his theory further, Callicott states that Charles Elton, half a century after Darwin, added another dimension to these social circles when he discussed how human

beings conceive of ecological relationships as uniting plants, animals, soils, airs, waters and so on into biotic communities. He states that Aldo Leopold simply took Elton's community concept in ecology, i.e. that human beings and nature are united in biotic communities and added it to Darwin's understanding of ethics as a way of ensuring reproductive success and articulated the land or environmental ethic. (Callicott, 1999: 168) In other words, he developed the idea that bonds developed from mothers to ecosystems through an evolutionary process.

In Callicott's view, this basic understanding forms the bare bones of univocal ethical theory embedded in a coherent worldview that provides a framework for a variety of moral relationships that correspond to and support multiple hierarchically ordered social

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relationships. In his view one can therefore abandon moral pluralism's "theoretical menagerie". Callicott sees these moral sensibilities expanding from narrower to wider like the annular growth rings of a tree. The inner rings remain visible and present and the outer ones are added on more remote from the centre.

Callicott (1999: 169) states that this view is pluralistic in the sense that it involves multiple overlapping and competing community-generated duties and obligations but it is not pluralistic in the sense that there is only one metaphysics or code of morals. This means one concept of human nature is understood, that is that humans are social animals developing through evolution, secondly that there is one understanding of morality as being rooted in moral sentiments and one approach to moral psychology, that is that we respond to fellow members of our diverse communities in different degrees This differs from Stone in that it is not an ad hoc borrowing from different theorists but a coherent line of thought which Callicott draws from David Hume and Adam Smith to Charles Darwin to Aldo Leopold.

Callicott defends himself against accusations of trying to impose a communitarian moral philosophy and an associated theory of moral sentiments on anyone

else by force, except the force of argument. He says he supports interpersonal pluralism but not intrapersonal pluralism. He is of the opinion that philosophy can only flourish if a diversity of viewpoints can be expressed and debated. However, he believes one should also be committed to persuasion. Callicott states that intelligent people, if they take the time to work out their differences, will eventually reach agreement. Deconstructive post-modern difference is not workable, he states, because its end doctrine is that power, not argument, is what determines what is right. (Callicott, 1999: 175)

Wenz (2003: 220, 221), in an article where he distinguishes between minimal, moderate and extreme pluralism, makes the point that Callicott himself is really a moderate pluralist. Wenz identifies minimal pluralism as an approach that lacks a set of universal decision-making procedures for every moral situation. He states that every ethical theory in fact is a form of this minimal pluralism. Utilitarianism for example could produce two

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different courses of action that both show maximum utility in a given situation. This amounts to a form of pluralism. Kantianism also fails to give unambiguous answers to every moral situation, for example what about telling a lie to save the life of an innocent child. Surely, many people would claim that this would be obligatory. Wenz states that there are no moral theories that are able to provide a set answer for every situation.

Wenz (2003: 222, 223) describes Stone's version of pluralism as extreme. He says it is extreme because it adopts different ethical theories for different contexts. He quotes Stone's example of a senator who makes use of utilitarianism to decide between legislation proposals, and then Kantian theory when making ethical choices that relate to his family and friends, and is a Leopoldian ethicist in relation to wilderness. Wenz agrees with Callicott that this amounts to performing "metaphysical musical chairs" because each of these theories implies a different understanding of the self and worldview.

Wenz (2003: 224) sees Stone's mistake as occurring because he attempts to compare the differences among the sciences, social sciences and arts with the differences between ethical theories. The problem here is that ethics, unlike the sciences, always occurs after everything relevant has been considered. Therefore one cannot compartmentalise ethics, it is supposed to take a variety of outcomes into consideration. Returning to the example of the senator used by Callicott, Wenz points out that the senator when considering legislation in a national park, would have to consider the value of wilderness preservation or species diversity. He would be acting immorally as a senator if he did not consider this in national park legislation. Wenz states that moral behaviour requires that one honours all of one's commitments simultaneously. It is the nature of morality that we have to make decisions considering all the relevant facts. Judgements in specific disciplines like art and chemistry, however, are made according to different rules. Wenz concludes that Stone's extreme pluralism is therefore unjustified.

Moderate pluralism on the other hand does not involve swapping between different theories because it is a complete theory. (Wenz, 2003: 224) It is pluralistic because it contains a variety of independent principles, principles that cannot be reduced to a single

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master principle. Wenz describes extreme pluralism, on the other hand, as involving a plurality of theories. The senator, used in an earlier example, is expected to uphold the same principles in the senate as in his living room. Each principle must be considered whenever it is applicable. The senator must face all situations with the same set of principles. Wenz states that it is true that the weight given to some principles will vary in different contexts. If the moral obligation to avoid harm or hurting someone's feelings is weighed with honesty, there may be some situations like when toasting to the beauty of a bride (whom you do not think is beautiful) would be morally justified.

In assessing Callicott's land ethic, Wenz (2003: 225, 226, 227) points out that Callicott's

land ethic does not do away with traditional morality, but rather adds another dimension to the ethical obligations of human beings. All the different circles of moral concern in Callicott's approach are ruled by principles. Some moral principles discuss which moral relationships are more important than others, for example parenthood being more important than friendship, other principles point to when citizenship duties override familial ones. Wenz concludes that Callicott's land ethic has a variety of principles that cannot be reduced to a single master theory. He therefore infers that Callicott is really a moderate pluralist.

In terms of ecological economics, where the predominant form of valuing the environment is exchange values, Stone's extreme moral pluralism offers some justification for pursuing multiple values. However, it falls short of providing one with a way of prioritising or integrating the diverse environmental values that might arise in an economic decision-making context. Callicott is accurate when he points out that Stone's approach amounts to anything goes. Much more than a vague "lexical ordering rule" is needed in public economic decision-making to justify actions affecting the environment. One needs to be able to suggest a process or method by which these diverse values could be selected, prioritised or ignored.

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At face value it would seem that Callicott's communitarianism can provide one with a way of doing just that, of prioritising a diversity of environmental values in economic decision-making. After all, it posits an alternative to traditional morality by extending the boundaries of human moral concern to include ecological concerns based on a form of evolutionary kinship. His communitarianism provides a convincing reason for humans to consider ecological wholes morally without compromising responsibilities and duties to humans. One would be able to include some environmental intrinsic values within the outer ring of morality that touches on ecological concerns. Economic decisions about whether to prioritise environmental exchange value or ecological

intrinsic value could, in principle, be prioritised according to the responsibilities that human beings held towards each other and ecosystems. However, despite this ability to justify subjective intrinsic value, I argue that Callicott's moderate pluralism is insufficient as an ethic for including environmental concerns in economic decision-making because of the methodology it employs to arrive at ethically justifiable decisions.

While Callicott's approach to environmental decision-making is inclusive in its communitarian ideas, it is not inclusive in its methodology. The action it takes is one of imposing a communitarian understanding in a situation where not everyone may share that view. In a sense, it starts off on the wrong foot by trying to justify a particular value prioritization. While Callicott accepts that there is more than one value at stake in environmental decision-making in his form of communitarianism, his approach is not to understand how others might prioritise environmental values in any given situation but rather to defend his already worked out solution. This, I argue, does not take pluralism far enough. What is needed is a more extreme form of pluralism that focuses on unearthing all the possible values that people ascribe to a given context. In other words, I argue for a pluralist framework that self consciously seeks out the diversity of existing viewpoints about an environmental dilemma from the outset. However, once it has achieved this it should be able to provide a method for developing agreement on the prioritization of values in the public domain of economic decision-making.

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Light, (2003: 233) in an article entitled The Case for Practical Pluralism takes up this issue of the need to form a "moral consensus" around environmental issues. He makes the point that the problem with a unified theoretical approach, like Callicott's approach, is that it does not provide clarity on how we should go about forming a moral consensus around environmental issues. Even if one approach were sufficient to encompass all the ways in which humanity values the natural world that would not mean that environmental

philosophers had completed their task. Light sees part of the task of environmental philosophy being able to articulate diverse environmental values and in so doing allow them to be examined. I interpret Light as making a practical point here, that seeing as people do value the environment in a variety of dissimilar ways surely, an environmental ethic that embraced this diversity would go a long way to forming a consensus around environmental ethics. This would seem more likely to be the case than an approach that claimed to have already found the way in which the environment ought to be valued. Light (2003: 233, 234) draws on Brennan's understanding of pluralism. Brennan's form of pluralism asserts that there is no single activity involved in assessing any situation. There is no privileged set of concepts or structures which could be used to interpret a situation. In positing this form of pluralism, Brennan is making a case for the complexity of moral considerations. This form of pluralism goes further than saying that different situations call for different interpretations and says instead that one and the same moral situation could be viewed in many different ways. (Brennan, 1992: 29)

Brennan believes that the idea that people can switch from one ethical theory to another, though a caricature, does illustrate how we can overlook the various dimensions of a problem when we look at things from a single approach. Brennan is of the opinion that part of being morally engaged with the world around us involves having to comprehend a multiplicity of perspectives that is not found in textbooks, and I will add, also not in journals of environmental philosophy. (Brennan 1992: 29, 30) He is in favour of a moral approach that attempts to increase instead of reduce the ways in which we can view a moral problem.

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He sees the non-anthropocentric ways of valuing the natural world therefore not as a supplanting of an anthropocentric approach to valuing the natural world, but as a further sophistication of the ways in which we can value the natural world.

What this more extreme form pluralism does then is to change the focus of environmental philosophy from providing a single approach to viewing the natural world, to providing connections to the various ways in which people value the natural environment. Light explains this need not result in moral relativism. "This does not mean that pluralists must endorse jumping from one ethical system to another depending on the situation, but rather that would consistently look for multiple ways of describing the value of any bit of nature that we want to preserve or restore so as to appeal to a range of interests, both anthropocentric and non-anthropocentric alike." (Light, 2003: 234)

To recap the argument in this thesis up until now, in Chapter 1, I showed how the adoption of an exchange value based environmental ethic in the form of neo-classical economics is unable to fully protect the environment, and followed on to show how ecological economics, because it remains embedded in the market mechanism, ends up falling back on a limited form of utilitarianism, and therefore also offers the environment inadequate consideration. I made the point that if ecological economics wishes to move the debate forward, it will have to embrace other forms of non-utilitarian or subjective intrinsic values.

Put in another way, we need to take into account in economic decision-making the diversity of ways of valuing the natural world. However, the problem with including a non-utilitarian, non-anthropocentric ethic in economic decision-making is that one is faced with having to accept plural moral frameworks where there are multiple sources of value and, like Stone, one could fall into a form of moral relativism or "metaphysical musical chairs" (Callicott, 1999: 160). In this section, I argued that what is needed is to move ecological economics beyond reducing all value to exchange value and instead to adopt a form of moral pluralism. I conclude however, that both Stone and Callicott's approaches are inadequate. Stone's approach, though helpful in demonstrating how

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different contexts give rise to different value priorities, is

unable to move us towards the prioritization of these diverse values in the public domain of economic decision-making. Callicott, on the other hand, fails to allow for a plethora of values to emerge in a given context and therefore is unable to rescue ecological economics from reductionism. His approach though open to a wider range of environmental values still remains a form of reductionism in the sense that it attempts to justify a particular prioritization of values.

I therefore argue that what is needed in economic decision-making is a form of moral pluralism that shares the breadth of potential moral values of Stone's approach with the practical prioritization generated by Callicott's communitarian framework. It needs to be an approach that is able to combine new ways of valuing the environment with the exchange value, utilitarian ethic that is dominant. In a public environmental debate or forum when one is confronted with a multitude of stakeholders who all have their own metaphysical frameworks one has to look at ways of building consensus so as to move forward to action.

Callicott's focus on the land ethic that highlights the importance of ecosystems in relation to other more traditional spheres of morality like family relations and community concerns is helpful as an insight to how people could go about integrating environmental concerns into their economic decision-making. However, it becomes unhelpful if it is posited as metaphysical theory or a public policy agenda that must be implemented. In a post-modern global economy, where multi-culturalism and value pluralism is the norm, what is needed is a process approach in economic decision-making rather than a metaphysical theory that is able to take the contextual, time-bound nature of morality seriously without falling into an anything goes kind of relativism.

What am I advocating? I am making a case for an approach to environmental ethics in economic decision-making that takes seriously the very constructed nature of reality and morality, i.e. facts and values. This is because "solutions" to issues of moral value in the environment are always by definition context bound, and always subject to change as

long as new perspectives emerge. To say that one has arrived at the final solution or

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ethical approach to economic decision-making for all time, is to deny continuing human experience and adaptation. Instead, at this point in the history of the disciplines of economics and environmental ethics, one needs an approach that is self-conscious of the constructed nature of reality, without being value free in a relativist sense, and that, I believe is found in the theory of environmental pragmatism that is the subject matter of our next section.

C. The value of a pragmatic approach to economic decision-making

Before embarking on this section on pragmatism, it is important to point out that this is not intended as an exhaustive account of pragmatism per se, but rather an attempt to demonstrate the usefulness of some central tenets of pragmatism for facilitating the inclusion of a diversity of environmental values in economic decision-making. There is much debate among philosophers regarding whether historical pragmatists can be regarded as environmentalists. Some like Bowers state that Dewey should not be regarded as an environmental and eco-justice philosopher because he, among other reasons, does not value other more ecologically sensitive traditional cultures, ⁹ whereas McDonald claims that Dewey's naturalism is especially relevant to environmental ethics and that it challenges anthropocentrism. ¹⁰

However, it is not necessary for the purposes of this thesis to enter these debates, because I seek only to justify an appropriate methodology from environmental pragmatism.

Though I acknowledge that methodologies are themselves linked to metaphysical theories and in no way stand outside them, the debate itself falls outside the scope of this thesis, the focus of which is to demonstrate the value of an environmental pragmatist methodology within an ecological economic decision-making context. I support a point made by Light (2002b: 88-93) that one need not be a pragmatist to support a pragmatist methodology in ethical deliberation about the environment.

Bowers, C.A. 2003. The Case against John Dewey as an Environmental and Eco-Justice Philosopher.

Environmental Ethics 25 (1): 25-42, Spring

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McDonald, H.P. 2002. Dewey's Naturalism. Environmental Ethics

24:189-208, Summer.

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One could support a pragmatist process on the grounds that it yields results and enables one to get beyond ideological stalemates in economics and environmental ethics.

In the discussion that follows, I will focus on what shape that methodology would take by looking at the constructed nature of truth in pragmatism, the central role of environment in pragmatism and the importance of experimentation within pragmatism. These aforementioned points are central to developing a more inclusive methodology for economic decision-making about the environment.

Pragmatists have a particular understanding of truth. This understanding holds some useful insights for how environmental considerations could be better incorporated into economic decision-making. Historical pragmatist William James highlights how human beings are involved in creating truth and meaning. He describes it in an essay he wrote on Pragmatism's Conception of Truth. James writes: " Truth happens to an idea. It becomes true, is made true by events. Its verity is in fact an event, a process: the process namely of its verifying itself, its veri-fication. Its validity is the process of valid-ation. " (James, 1997: 114)

What is important here to highlight in terms of the discussion of this thesis, is that truth is a process. As humans we are not privy to absolute truths, only truth as understood by ourselves in a particular time and place. This view on truth is core to pragmatism and differs somewhat from some who label themselves pluralists but not pragmatists. Pluralist Moriarty (2006), for example, claims that pragmatism misunderstands truth, i.e.

pragmatists believe that something is truthful because it emerges whereas Moriarty believes that truth emerges from situations because it is truth.

A staunch pragmatist would never agree to Moriarty's conception of truth because they do not believe that there are any foundations or principles on which to base reality. Parker (1996: 22) explains it like this: "Experience can however at any time expose our settled beliefs as false, or reveal an unsatisfactory vagueness or confusion in our concepts. Knowing is therefore an open-ended quest for certainty in our understanding ..."

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Experience is therefore capable of shaking the concepts one uses to describe reality and can force one to change them altogether and/or adopt new ones. This means that to know something in this world is to know it for a time, until some better theory or explanation displaces it.

Norton (2007: 302) echoes this understanding in an explanation of historical pragmatist Pierce's account of truth. He states that for Pierce "truth cannot be made certain in the present" because truth can only be revealed once all the experiments and analysis have been done and inquirers are satisfied, that all has been considered. If one claims something is true in the present what you are really doing is making a "prediction" that it will be accepted as such. Norton recognises that what one claims as truth today might be rejected in future.

Pragmatism's understanding of truth is admittedly controversial and for this reason it has the potential to derail attempts to establish a methodology for ecological economics especially if theorists lock horns over whether there is such a thing as truth and whether it is a worthwhile project to pursue. However, I would like to suggest that it is not necessary to split hairs about whether truth emerges because it is the truth or whether what emerges is called truth. While this might be central to whether you call yourself a pragmatist or not, it is not central to the acceptance of the methodology that is inspired by pragmatism. One need not accept the metaphysical statements of

pragmatism to find its process of acquiring truth useful.

The second aspect of pragmatism that makes it appealing as a methodology for including environmental concerns in economic decision-making is its recognition of the radical interconnectedness of human beings with their environment. Parker (1996: 21) mentions that early pragmatists rarely wrote about environmental issues. However, their theories have direct relevance to the way in which the relationship between human beings and their natural environment are perceived. McDonald states that Dewey's description of the intimate relationship between human beings and their environment is the very basis for an environmental ethic.

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This is because Dewey did not see organisms as separate from their environment but as integrally connected to them for survival. McDonald explains that Dewey understood that all life happens within an environment. To quote historical pragmatist Dewey directly: "The effect upon the theory of knowing is to displace the notion that it is the activity of a mere onlooker or spectator of the world, the notion which goes with the idea of knowing as something complete in itself. For the doctrine of organic development means that the living creature is a part of the world, sharing its vicissitudes and fortunes, making itself secure in its precarious dependence only as it intellectually identifies itself with the things about it, and, forecasting the future consequences of what is going on, shapes its own activities accordingly. If the living, experiencing being is an intimate participant in the activities of the world to which it belongs, then knowledge is a mode of participation, valuable in the degree in which it is effective. It cannot be the idle view of an unconcerned spectator." (Dewey 1997: 210)

McDonald also states that Dewey's philosophy emphasises that human experience is both about the environment and also a part of the environment. While one might perceive natural objects as external to oneself, this does not mean that human beings are separate from their environment, that very human experience is also part of

nature.

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experiences of the human mind emerge from within a body and cannot be separated from it. It must be in a body to operate. McDonald explains it like this: "Mind is not mind unless it fulfils such imperatives of place. Mind is not only within nature, but also of nature, as it arose by natural processes, acts through them, interacts with them and is constituted by them." (McDonald 2002: 197)

Similarly, McDonald points out that values are not something separate from one's environment. They are part of how human beings experience the environment and therefore dependent on the particular circumstances within an environment. The valuing of the environment within the economy therefore happens within a particular set of physical circumstances and is a response to various stimuli in that context. The economy is therefore a reflection of society's value choices within a particular set of environmental constraints and opportunities.

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How is pragmatism's understanding of truth and its emphasis on the radical connectedness of values significant for including environmental concerns in ecological economics? It is because it allows one to question the orthodoxy with which statements like the following are uttered in economic decision-making: "society has no choice but to exploit the environment because it needs to create industry and jobs for people". It allows one to begin questioning the ideological foundations of such economic thinking. Norton (2007: 303) describes ideological commitments as ones that cannot be proved true or false by experience. He states that they are commitments that one imposes upon experience.

If truth is a process and values are dependent on the interaction between human beings and their environment, then this truth mentioned about the economy in the preceding paragraph is not cast in stone but rather the way in which a particular society at a

particular time valued the environment within the economy. Pragmatism helps one to recognise that one's economic reality is really a construction of one's value system that is composed in interaction with one's environment. In this thesis, I propose that the current state of environmental degradation is largely a result of human beings over valuing consumer preferences within the economy at the expense of other ways of valuing the environment.

This brings us back to the dilemma discussed in the previous section under moral monism and moral pluralism where I criticised Stone's pluralism for not providing sufficient guidance about how to prioritise values and Callicott's approach for failing to provide us with an inclusive enough methodology for economic decision-making. I was on the look out for an approach to economic decision-making that enabled me to be critical enough of some of the home truths of the current economic paradigm and inclusive enough to allow for additional ways of valuing the environment within the economy to emerge. In the preceding paragraphs I have provided justification for the usefulness of the pragmatist contextualised process approach to examining truths within the economy.

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I now move on to the third aspect of pragmatist theory, its focus on experimentation as means of generating new knowledge. How does one, once you have analysed the problem within economic decision-making, move forward to develop new value systems and home truths that will move one out of the current environmental crisis.

Pragmatism subjects all values and knowledge systems to the test of experience to test their viability. Dewey refers to this process of testing hypothesis with experience as the experimental method. Dewey (1997: 210) states: "The development of the experimental method as the method of getting knowledge and of making sure it is knowledge, and not mere opinion – the method of both discovery and proof – is the remaining great force in bringing about a transformation in the theory of knowledge." Dewey

describes the experimental method as having two sides: firstly that knowledge is only knowledge once it has been tested without this our knowledge is only hypothesis or proposed experiment and secondly, that the experimental method of thinking is about anticipating future consequences through observing the present.

Dewey (1997: 211) states that the experimental method might be new as a scientific resource, but it is an old practical device used for technical and physical problems. He suggests that it will take some time for people accept it as a method of social and moral enquiry. Dewey is also sceptical of people's willingness to adopt experimentalism because it is often safer for people to hold on to beliefs that have been fixed by authority. Dewey explains why people react in this way: "Men still want the crutch of dogma, of beliefs fixed by authority, to relieve them of the trouble of thinking and the responsibility of directing their activity by thought. They tend to confine their own thinking to consideration of which one among the rival systems of dogma they will accept." (Dewey, 1997: 211)

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In summary of this section then, pragmatism as a philosophy offers economic decisionmakers justification for a method that is both contextual and critical as experimental. It is suggesting that economic decision-making should embrace a process approach to truth, focus on human beings as part of their natural environment rather than separate and see exchange values of the environment within the broader context of other ways in which we value the environment.

Does this mean pragmatism is anti-metaphysics? No, while it is fundamentally critical of metaphysical theories that try to have the final word about how the world is, pragmatism recognises the need for metaphysics. Parker (1996: 24) makes the point that pragmatist Peirce observed that those who claim not to engage in theories about the world, do not avoid metaphysics, they just use other people's ideas about how the world is. Pragmatism acknowledges that one cannot avoid making up theories of truth, like

Callicott's land ethic, but as long as we realise that they are only that, theories of truth that stand to be corrected by experience 11 .

In the section that follows, I will move on to discussing what a pragmatist methodology for including environmental concerns into economic decision-making would look like. I do this using the adaptive management philosophy of environmental pragmatist Bryan Norton.

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However, environmental pragmatist Norton (2007: 302, 303) defends his pragmatic epistemology against claims that it is metaphysical. In doing so he appears to make the distinction between metaphysical claims that do not allow for empirical testing through experience and truth claims that are not metaphysical, because they do subject themselves to the scrutiny of the community of enquirers. Norton makes the claim that his pragmatic epistemology is not an ideological commitment or a metaphysical truth claim, but rather a truth claim that is open for scrutiny by a community of enquirers.

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I choose his approach for two reasons: firstly because Norton's hypothesis that environmental ethics and economics are both guilty of ideological accounts of environmental value offers a convincing explanation for why there is a stalemate between economists and environmentalists, and secondly, because he offers a practical way of bringing this stalemate to an end by advocating a three-pronged adaptive management approach to addressing environmental concerns in economic decision-making.

D. The value of a pragmatic approach to environmental ethics

Norton (1996:105) states that the discipline of environmental ethics, over the past twenty years, has focused on finding a set of principles to guide environmental action. The goal of these studies is to propose and defend a set of principles that is complete in that it is able to generate a single correct answer for every moral dilemma. All moral judgements are linked back to this set of principles for validation.

This search has yielded much fruit with a range of positions that can broadly be categorised into anthropocentric value theories, non-anthropocentric value theories and radical theories. (Hattingh, 1999: 69–77) 12 Anthropocentric value theories are focused on developing arguments for the use-value of the natural environment. In other words, the environment has value in so far as it can provide food, shelter, recreation and spiritual upliftment for humans.

Non-anthropocentric value theories try to extend moral

consideration to include members of the non-human world too. Ethical extensionists or intrinsic value theorists vary in where they place the boundary for moral concern, some let it include at least some animals, others ecosystems and others biospheres.

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For an additional overview of the field of environmental ethics read also Light, A. 2002a. Contemporary Environmental Ethics From Metaethics to Public Philosophy. *Metaphilosophy* 33 (4): 426–449, July. <http://web.ebscohost.com.ez.sun.ac.za/ehost/pdf?vid=3&hid=120&sid=79f4f8a7-74a6-4c56-a1a2e250cf642a74%40sessionmgr109> [22 February 2009].

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Radical environmental theorists investigate the underlying structures in human society and thinking that lead to the current destructive approach to the environment. Radical environmental ethics encompasses a number of different positions: the most prominent of which are deep ecology, eco-feminism and social ecology. (Hattingh, 1999: 69–77) Each of these theories brings to the table different ways of valuing the natural world.

Some intrinsic value theories stretch people's views of morality forcing them to consider the pain they inflict on sentient beings in their slaughtering of animals (animal rights) for meat, others take it even further, suggesting that an ecosystem is an entity that should be morally considerable. Deep ecology, eco-feminism and social ecology represent a whole

new way of looking at human identity, and the effect that this and society's sociopolitical structures have on the environment.

These intrinsic and radical environmental theories have contributed much to environmentalism by articulating the diversity of ways in which people value the natural world. They have influenced and inspired people to preserve wilderness and protect biodiversity. They have assisted in showing the limitations of an anthropocentric, utilitarian approach to environmental value. However, they become unhelpful when it is assumed that anyone of them represents the single value theory to which all value can be traced.

Norton (1996:106) states that it is this assumption that has "locked environmental ethicists into a paralysing dilemma, a dilemma that lies at the heart of most discussions of environmental values." If one subscribes to a monistic approach to environmental ethics then one is forced to think of the environmental valuation either as entirely instrumental or entirely intrinsic. Norton questions the idea that there should be only one kind of value, that is, either utilitarian and instrumental, or intrinsic. He believes that the search for a unified theory in environmental values has not achieved consensus about what inherent value in nature is, what objects have it, or what it means to have such value.

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It is for this reason that environmental ethicists have been unable to offer useful practical advice in controversial problems in environmental management and planning. He states that this approach to environmental ethics has served to narrow the debate in environmental ethics and made it difficult to build bridges across disciplines.

Environmental pragmatist Paul Thompson (1996: 200), in a discussion on water rights, states that a foundational approach to environmental ethics can lead to "stalemates". If the purpose of an applied philosopher in ethical analysis is to ground the arguments of the different parties into recognisable philosophical positions, then all that happens is that

they give people better justification for why they should hold onto their points of view. People do not easily give up their philosophical positions, unless they wish to change their foundational argument.

Sometimes, it might have been better, in terms of finding a solution, if they had held on to their initial vague understanding of their argument. He concludes the paragraph by stating: "If this is what applied philosophy yields, we might be better off with lawyers!" (Thompson, 1996: 200) Instead of trying to understand the point of view of someone else, one is constantly trying to seek bigger and better justifications for one's own theory. This results in the polarisation and the demonising of opponents' viewpoints. It is easier to brand opponents as "money hungry developers" or as "liberal activists with nothing better to do", than to fully consider their viewpoints in a common future. On a policy level, when one's viewpoint is supported by those in power, this can result in a form of domination as one dogmatically forces one's convictions on others with total disregard for their point of view.

Thompson (1996: 200) states that a pragmatist will offer a different approach to that of a foundational philosopher. Instead of asking how they can apply their theory to a particular problem, they will focus on the problem at hand, i.e. that there is a dispute over a particular issue like water use. Working from this problem orientation, they will ask how the problem can be solved in a manner that is in keeping with the values of those involved in the water dispute.

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Environmental pragmatism in this sense turns environmental ethics on its head.

Pragmatism does not start with a theory on the relationship between the environment and human beings and try and impose a solution on a problem but rather the analytical journey begins with the environmental problem, like that of contested water rights, or what to do about an overpopulation of elk in a reserve.

Environmental pragmatism does not offer us a final framework or truth from which all

environmental problems can be solved it rather just suggests a method of inquiry that will help us to resolve contentious environmental dilemmas. To explain the difference, Norton (1996: 107) uses the distinction between two kinds of non-theoretical philosophy: "applied philosophy" and "practical philosophy". He uses the terms to refer to two distinctly different roles for philosophers in the process of public policy formation. In applied philosophy one develops very general and abstract principles and illustrates how they are used by discussing hypothetical cases. Practical philosophy, however, looks for the solution to an ethical problem within the context of the problem as it is articulated. Theory is derived from a case study itself instead of from a set of unrelated principles. Norton describes it like this: "Practical philosophy ... is more problem-orientated; its chief characteristic is an emphasis on theories as tools of understanding, tools that are developed to resolve specific policy controversies." (Norton 1996: 108)

This difference in approach between practical philosophy and applied philosophy points to a deep underlying difference in philosophical theory. (Norton, 1996: 109) It is one that is to be found in the age long search for the foundations of all knowledge, the key underlying concepts from which all reality can be explained. (Norton, 2002: 14, 15) Applied environmental philosophy is still involved in this search, it is still looking for those key principles to which all morality regarding the environment can be reduced. Practical environmental philosophy, on the other hand, has abandoned this search as futile and is satisfied that it is unable to find the ultimate categories of morality to which all environmental problems can be reduced. Instead of searching for these principles, it seeks to solve the problem at hand with the best available ethical tools.

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This debate between a foundationalist environmental ethic and non-foundationalist environmental ethic comes to the fore in the philosophical discussions between Norton and Callicott surrounding the concept of intrinsic value. In an article on differing

approaches to environmental values, Norton (1996: 111) claims that Callicott is trying to rescue environmental philosophy from being reduced to utilitarian cost-benefit analysis by holding on to the concept of inherent worth. He quotes Callicott as asserting that when something is inherently or intrinsically valuable it means it is objective. Norton states that Callicott commits himself to "good old fashioned realism" when he does this. In attributing intrinsic value to "ecosystems" he is offering this as the "Holy Grail" or the final principle to which all environmental problems can be traced back. (Norton, 1996: 111)

Just how one justifies a foundation like the inherent worth of ecosystems, or the idea world of Plato, has been the central issue in the history of modern philosophy and modernism for hundreds of years. The advocacy and criticism of foundationalism has centered around what is the nature of foundational beliefs and what gives them authority and how does one infer other truths from this foundational belief. (Norton, 2002: 14)

Norton traces this whole search for certainty and true knowledge back to Descartes who insisted that for our beliefs to be supported at all it must be supported by deduction from a self-evident base, from a priori reason based foundation. Ever since then, "epistemology became a battleground between 'foundationalist' believers and sceptics". Philosophers like Kant sought certainty in reason. The logical positivists looked for certain knowledge in experience. Both proved futile. Norton supports analytic philosopher Quine's point that it is impossible to use sense data to arrive at certain knowledge about the external world. Language offers no foundation either because there is no point outside our various languages from which we can ground our system of beliefs. Experiences cause us to correct or change our system of belief like when scientists changed from defining whales as fish to putting them in the taxonomic category of mammals. (Norton, 2002: 14, 15)

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It is because of this history of metaphysical thought that Norton

takes such exception to Callicott's approach. Norton is of the opinion that the lesson of modern philosophy has been that foundationalism or essentialism, the view that the world consists of prelinguistically existing entities, is unsupportable. He argues that if Callicott wants to claim that ecosystems have inherent worth and that all environmental problems should be traced back to ecosystem health, then he is proposing a kind of essentialism which would have to be defended against the above mentioned criticism of metaphysical history. (Norton, 2002: 17)

Callicott (2002: 108, 109) insists that he is not supporting foundationalism. He states in trying to expose the conceptual foundations of his ecosystem ethic, he is not proposing self-evident a priori principles, nor is he trying to deduce any absolutely certain moral precepts from it. Instead the land ethic rests on evolution, ecological biology and Copernican astronomy. It is evolutionary theory that provides the link between ethics and social organisation and development. It provides a kinship with other creatures on the "odyssey of evolution". Ecological biology provides the community concept or sense of social integration between human beings, plants and animals. The Copernican perspective is the perception that the earth is a small planet in an immense and utterly hostile universe beyond, and this reinforces our interdependence with all inhabitants of Earth. He states that natural selection has endowed human beings with an effective moral response to perceived bonds of kinship and community, and it is this that makes a land ethic not only possible but also necessary, because humans have acquired the skill to destroy nature.

Norton (2002: 18-20) accedes that Callicott's version of foundationalism is different to the traditional approach. He proposes that Callicott could be engaging in an "explicative foundationalism". It is a weaker form of foundationalism that endorses the view that, for any system of beliefs, it is possible to identify some set of basic beliefs or principles that are not themselves to be justified within the system. These principles are starting points in justifications for non-foundational beliefs.

Unlike strong foundationalism, explicative foundationalism makes no claim on universality of foundational beliefs and principles. Identifying foundations is simply to reveal the structure of the belief system, and to suggest the proper flow of argumentation within the system.

Norton's discussion of Callicott's explicative foundationalism brings to the fore the dilemma that environmentalists engaging in economic decision-making face. They posit alternative forms of valuing the environment that show up the limitations of economic thinking. In the previous chapter, we discussed how environmental economics adopted a price-based utilitarian approach towards the environment that used as its point of departure the consumer preferences, and at best real needs, of individual human beings. I also discussed the limitations and criticisms of this approach, showing how ecological economics attempted to move beyond the confines of these parameters by focusing on the relationship between human need within the confines of the ecosystem. However, ecological economics ultimately remained trapped within a limited form of utilitarianism because its utilitarian approach to valuing the natural world cannot make sense of a concept like intrinsic worth that cannot be properly quantified. However, the same could be said of the concept of intrinsic worth, either an object possesses it or not. If an object does not possess intrinsic worth then it is not worthy of moral consideration. The concept of use-value that is central to the valuation of the environment within economic decisionmaking cannot be made sense of in the theory of intrinsic value. It therefore disregards it when making moral decisions about the environment.

However, what is ironic is that there is a marked similarity between environmental pragmatism's

embracing

of

Darwinian

evolution,

ecological

adaptation

and

experimentation, and Callicott's explicative foundationalism that has its roots in evolution and ecological community. Callicott himself states that the evolutionary biology, ecology, cosmology, philosophical anthropology and moral psychology fits in

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with Quinean theory.

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(Callicott, 2002:109) Their similar "explicative foundational beliefs" are, however, arrived at remarkably in two completely different ways. Callicott starts off with positing his foundations, and environmental pragmatists begin with a problem identification and through experimentation and adaptation resolve it in a way that is in keeping with participants values.

The point I wish to highlight here is one of method. Environmental pragmatism's method enables ethicists to move beyond political stalemates through initiating an experimental, contextual approach when engaging with decision-makers. It is, in my opinion, more likely to achieve consensus than Callicott's explicative foundationalism in that its approach is from the start inclusive in that it acknowledges the validity of their diverse and divergent ways of valuing the environment within a context. Explicative foundationalism on the other hand starts off with a set of principles that it attempts to impose on a situation. Even though these principles end up being very similar to that of pragmatism, the approach is more dogmatic. This is the same point I made earlier in the previous section where I introduced pragmatism.

Norton takes it further by showing that he sees the problem lying in the fact that neither neo-classical economics or ecological economics have a vocabulary

for thinking and talking about environmental problems or environmental values. Neo-classical economics simply expanded commodity values to include public goods, which in itself created problems, since public goods lack the key aspect of exclusivity that is necessary for their pricing and efficient exchange in markets. This gave rise to the concept of "shadow pricing" as a new kind of economic value in contingent valuation. (Norton, 2005: 167, 168)

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Norton describes Williard Van Orman Quine as a philosopher who criticized Cartesian epistemology and who did not believe that certainty about the world could be deduced through reason or through experience. (Norton 2005: 563)

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In ethics, the expansion of moral consideration to other species, ecosystems, etc. meant that one had to apply the concepts like human rights to the non-human world. Environmental ethics also blurred the distinction between moral subject and object by debating which other moral subjects there were in nature. This is despite the fact that the distinction between moral subjects, humans, and moral objects, non-humans is central to traditional ethics.

Norton (2005: 180, 181) points out that both of these approaches are inadequate on their own in public debates about environmental values. What is really needed is a whole new way of speaking about nature and our place as human beings in it. Our failure to communicate effectively about the environmental problems that we have within our economy is a public symptom of the lack of an adequate moral approach in both economics and philosophy.

What should an approach like this look like? In the section that follows we will describe Norton's attempt to bridge the gap between environmental ethics and economics theories with his theory of adaptive management.

E. Norton's adaptive management approach to economic-decision making

In a sub-heading of Norton's book *Sustainability* entitled "Breaking the Spell of Economism and Intrinsic Value Theory", he discusses how economics and environmental ethics dominate the discussion about environmental value. While they value the environment in opposing ways, they are unified in their implicit assumption that monistic value theory is the way in which environmental values ought to be expressed. (Norton 2005: 183) The fact that they both share monism as an ethical basis brings about other similarities. Economists and intrinsic value theorists both believe that there is a dichotomy between instrumental value theory and intrinsic value theory. (Norton, 2005: 181, 182) They use this dichotomy to separate nature into beings or objects that are morally considerable and those that are not. To be morally considerable one has to possess this inherent quality.

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In the case of economics it is bestowed on humans, and in intrinsic value theory, on different aspects of nature. In both cases there is a distinction between instrumental values and intrinsic values.

Secondly, both economics and intrinsic value theory focus on objects and entities rather than dynamic processes and changes in processes. (Norton, 2005: 182) In economics the aim is to protect the interests of individual consumers, and in intrinsic value theory the aim is to protect individual species or ecosystems. Norton points out that this focus on forms rather than flux can be traced right back to Plato and the time of Heraclitus. Plato believed that reality was made of constant forms and Heraclitus that all was constantly in flux. Since Charles Darwin's evolutionary theory, and now the influence of systems theory, the emphasis has swung back to a more dynamic worldview.

Thirdly, environmental values in both economics and intrinsic value are treated without context and therefore expressed in a single unit. (Norton, 2005: 183) In the case of economics, it is expressed in the form of monetary values, and in the case of intrinsic

value theory it is expressed in term of units of intrinsic value like ecosystems or species. This removes the relationship between this particular attribute and the rest of the context in which it operates. This results in an "abstracted, context less and a placeless sense of value" that is able to be transferred across boundaries. It also creates an unnecessary tension between development values and intrinsic values. Communities, when thinking in terms of these monistic theories, are forced to decide between sustaining precious ecosystems and destroying them to feed the people.

Norton claims that if the above assumptions are denied it will have a profound effect on values and policy formation. Norton (2005: 186, 187) states that if one acknowledges, as Callicott does in the end, that valuing is a verb, then the distinction between the instrumental value of nature and the intrinsic value of nature changes status, and they are really just different ways in which the human subject values nature. It is not nature that has value in and of itself but rather humans that give it value in that way. The task therefore shifts from trying to bestow intrinsic value or measure instrumental value on

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nature, to providing good reasons for invoking a particular value, regardless of whether it is instrumental or intrinsic in a given context. When formulating policy this would mean that it would be possible to include both intrinsic and instrumental values as reasons for justifying why one makes certain choices.

Furthermore, if one stops trying to identify which objects possess instrumental or intrinsic worth then the focus could move to tracking development processes that protect the instrumental and/or intrinsic values that the community upholds. (Norton, 2005: 187, 188) One could say things like development path A is more likely to enhance and protect these instrumental and intrinsic values, and development path B those intrinsic and instrumental values. So, the community could choose an option that includes the right mix of instrumental or intrinsic values for their context.

Instead of sticking to monism, one could start from the viewpoint

that "all cultures value nature and natural processes in many ways". (Norton, 2005: 189) Unlike Callicott (1999: 157, 159), who believes we need to sift through the value theories on the environment and discard those that are obsolete, Norton believes we must start with the multitude of ways in which people value the environment. This encourages one to think of environmental conflicts as choosing between multiple goods, not as trying to maximise one particular good, i.e. intrinsic worth or economic efficiency. It tries to create situations where people with diverse values might support common objectives. There is therefore no longer a requirement that all values be commensurable. The emphasis is rather on finding connectivity between the different value theories so as to establish development paths that are commensurate with the variety of values that are upheld.

The process of establishing these development paths in economic decision-making, that include both instrumental and intrinsic ways of valuing the environment, is no easy task. The reason for this is because they present themselves as "wicked problems". Norton (2005:131-133) borrows this term from Horst Rittel and Melvin Webber

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who used it to

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Horst, R and Webber, M. 1973. Dilemmas in a General Theory of Planning. *Policy Sciences*, 4: 155-169 (Norton 2005: 584)

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describe problems with creating sewage and water systems for cities. They distinguished wicked problems from benign problems. Benign problems were mathematical or scientific problems for which it could be seen that there might be a unique solution, like for example, finding the most efficient design for removing sewerage from a city. Wicked problems, however, do not allow for permanent solutions.

Norton (2005: 133-135) lists four characteristics of wicked problems

that are useful for understanding the nature of environmental problems. Wicked problems have controversial problem formulations because value pluralism is present and disputants in wicked conflicts are pursuing different values and goals. If one formulates the problem prioritising a certain value then another value is made less important, resulting in controversy. Secondly, there is no optimal solution that is calculable for a wicked problem. This is because while computer programmes can handle multiple criteria, they cannot tell one how to weight or prioritise the multiple criteria. Wicked problems require that judgement be exercised. Thirdly, it is not possible to repeat wicked problems. They represent a unique combination of interests and limitations and do not follow standard solutions. Fourthly, wicked problems display an open-ended time frame. This is because they are multi-scalar in impact and there is always more information that could be used to alter the perspective. At best, a solution represents a temporary balance between competing considerations and interests.

Norton (2005: 135) writes: "Environmental complexity manifests itself to decision makers as open-ended and multilayered; environmental action must always be seen as directed at goals in one temporal frame but also having effects on larger and slower dynamics. Environmental problems are wicked because, given that participants in addressing the problem have many different interests, unintended and delayed consequences of actions undertaken to serve one interest will result in complaints from persons with other interests who count their interests over longer periods of time. Solutions to environmental problems remain, in this sense, open-ended."

How does one deal with the wicked nature of environmental problems that one finds in economic decision-making? It is not always possible to separate the factual issues from

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the value issues. Norton (2005: 203) is in favour of adopting an approach to moral reasoning based on experience. Experience should tell one whether a certain moral works

or not. If it does not, one changes it. This approach is called methodological naturalism. 15
This methodological naturalism could be achieved by establishing self-corrective processes in economic decision-making. It is not about deducing values from facts but about concentrating on creating fair, correctable economic decision-making processes.
Norton sees the separation between facts and values as artificial. He states: "to separate fact from value, description from prescription, is to do violence to the context in which ordinary language operates." (Norton, 2005: 203)

Norton is convinced that it is philosophers who have developed theories about the nature of ethics and value who have claimed that values are separate from facts and have a different logic. (Norton, 2005: 204) This idealisation is not helpful because it hides the similarities between the generation of facts and values that occur in everyday language. Instead of asking whether values can be derived from facts, pragmatists ask what processes of deliberation are more likely to achieve a proper integration of facts and values in a community's struggle for improved environmental decision-making in the economy?

Norton (2005: 203-205) maintains that in ordinary discourse this gulf does not exist. Individuals and communities talk about environmental problems and uncertainties in ordinary language. Every factual statement in everyday language also to some degree expresses the values of the speaker. All assertions, both factual statements and value statements, are open to the challenge of contrary experience. These challenges occur in a community of truth-seekers who agree to deliberate over how to collectively solve problems like resource degradation and species extinction. In principle, the process of methodological naturalism where every factual or value statement is subject to the

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Norton sees methodological naturalism as an alternative to a priorism or intuitionism in moral reasoning. I agree with Norton here. Basing moral reasoning on a priori categories leads to problems about how one justifies those moral categories. One ultimately has to fall back on subjective experience. Intuitionism

leaves little room for public debate on the motivation for moral action. It also creates no repeatable method for achieving convincing moral arguments. Concerning moral intuition or conscience, Norton (2005: 203) rightly asks how one deals with differing intuitions or moral consciences in moral reasoning.

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criticism of experience, is not about deducing the right answer from unquestionable facts. It is rather about a community of truth-seekers following a process of trial and error to arrive at a workable consensus. It is this process of methodological naturalism that forms the background to Norton's understanding of adaptive management.

The concept of adaptive management originated in the early 1900s with the ideas of scientific management and is linked to many areas of specialisation, for example business management, experimental science, systems theory, industrial ecology and social learning.

(Stankey, Clark and Bormann, 2005:4-6) However, the term adaptive management itself gained popularity with the work of natural resource management scholars Holling, Walters and Lee. Key sources included Holling's book Adaptive Environmental Assessment and Management

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that outlined a potential framework for complex environmental management problems as well as two subsequent books, the Adaptive Management of Renewable Resources

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by Walters, and Lee's book Compass and Gyroscope: Integrating Science and Politics for the Environment.

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The later two books further elaborated on the concepts outlined by Holling. Stankey, Clark and

Bormann (2005: 6) summarise the key tenets of adaptive management as follows: “the importance of design and experimentation, the crucial role of learning from policy experiments, the iterative link between knowledge and action, the integration and legitimacy of knowledge from various sources and the need for responsive institutions”.

Norton’s methodological naturalism resonates with the above mentioned key tenets of adaptive management in the field of environmental resource management. His approach amounts to a theory of action that is infused with values, or put differently, an action focused ethic. This action orientated ethic rests on three key tenets: experimentalism, multi-scalar analysis and place sensitivity. (Norton, 2005: 92)

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Holling, C.S. 1978. Adaptive Environmental Assessment and Management. London: John Wiley.
Walters, C.J. 1986. Adaptive Management of Renewable Resources. New York: Macmillan.

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Lee, K.N. 1993. Compass and Gyroscope: Integrating Science and Politics for the Environment. Washington, DC: Island Press.

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Experimentalism is a commitment to use experience to reduce uncertainty in science and to adjust goals and commitments where experience shows one should. Norton emphasises that values are, much like facts, also subject to the rule of experience. Values should be tested by experience.

Norton (2005: 93) links multi-scalar analysis to Aldo Leopold’s multiple scales of time and space. He says when Aldo Leopold said “think like a mountain” he meant that one should not only consider how the consequences of choices develop on individual, immediate time scales but also on the scales of decades and generations. Nature is therefore understood as a complex, multi-scalar interaction of parts. Norton distinguishes this version of holism from organicism that requires an ontological commitment to an a

priori whole. "Thinking like a mountain" amounts to a method of systems analysis. It requires that we as humans assess the systematic consequences of our actions within the environment as they play out on different scales of time.

Localism or place sensitivity is a commitment to examine each problem in its particular biophysical and social context. Relating this back to Darwinism, Norton (2005: 93) states that Darwinian adaptation is always local. It is always about an organism surviving or perishing in a particular context. On a societal level it is not about discovering static universal truths but rather about whether society has developed institutions and practices that are responsive to their local environment. Localism, when considered in tandem with the principle of multi-scalar analysis, means that the survival of a community takes place against the background of changing systems on many scales. These complex interactions, however, are always interpreted from a local place within the multi-scalar system. Norton makes the point that his conception of localism is not confined to a biophysical location but also involves a community of people. Localism implies both a commitment to the physical particularities of a place as well as the community. It implies participative governance. It is not just a geographic place but also a point in time in the human community.

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Each of these three principles of adaptive management has both a values and a factual aspect. (Norton, 2005: 95) Experimentalism applies to the social values that a community proposes as well as to the scientific management they are conducting. Multi-scalar analysis applies to the impact that the activities of humans have on the generation of present and future environmental values as well as the impact it has on the physical environment now and in the future. Localism as discussed above is about participative environmental governance among local stakeholders as well as about taking the particular physical characteristics of a place into consideration.

This move by Norton is significant because it makes the connection

between the values and the factual state of affairs in an environmental management context. He makes a case for subjecting environmental values to the same process of experimentation that one would physical experiments. This is important because adaptive management, by recognizing that values are an integral part of environmental management, forces people of divergent value orientations within environmental management to begin articulating points of departure. Once they have done this, they are required to subject them to public debate and, later experiential learning to see if they are viable approaches among the other offerings brought forward by other stakeholders. Norton's broadened adaptive management process foregrounds the implicit value dimensions of various management choices. In doing this he is making explicit the hidden and often implicit norms that guide environmental management decision-making.

This move by Norton to use adaptive management techniques on the values dimension of environmental management differs from the approach of scientific adaptive managers who often confine adaptive management to using the scientific method to solve physical management problems. Norton (2005: 94) points out that conservationist Peter Brown criticized him for making this move. Brown, who read a draft version of Norton's book *Sustainability: A Philosophy of Adaptive Ecosystem Management*, said that Norton had conflated adaptive management with public participation. He saw the two processes as separate. However, Norton sees this conflation as necessary for adaptive management to be politically implementable. Norton writes: "Put simply, I understand the scientific

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aspect of adaptive management to be applicable to goal-setting and to social learning about community values as well as about physical processes, so defining a functional adaptive management system for a public management process (unlike Peter Brown's private use of adaptive management) requires also that the management be politically feasible and capable of reflecting community-based ("place-based") values." (Norton

2005: 95)

This process of examining values within adaptive management is crucial to improving the quality of environmental governance. Norton writing with Steinemann (Norton and Steinemann, 2003: 526–528) observes that public involvement, in the conventional form, is often a once off event rather than a dynamic adaptive process that considers changing norms and physical realities over time, especially after project implementation. Norton and Steinemann recognise that individual preferences and perceptions change over time in response to new information, changing information and ongoing community involvement. They suggest that traditional methods of public engagement focus on ad hoc exchanges of information, rather than social learning and communication among individuals. It is understood that this insufficient form of communication can result in the ineffective implementation of decisions within environmental management

Norton and Steinemann make the point that when individuals interact with one another they begin to change their views and learn from each other. They would like to maintain this ongoing learning dynamic within public participation process in adaptive management. Therefore instead of simply aggregating all individual concerns in environmental decision-making and attempting to accommodate them at one time, they suggest adaptive managers should try and preserve the plurality of values in an ongoing process of decision-making. They suggest it is not useful to reduce everything to a single criterion. Instead, they advocate allowing this plurality of values to remain in place so as to allow community participants to beware of the alternative development paths they are constantly choosing between.

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Norton's (2005: 294, 295) adaptive management approach amounts to the co-operative interaction of public and experts in a shared goal of promoting or protecting a certain environment. These individuals would work together to learn about and discuss openly

the goals and methods of environmental management. This could be done through public advisory committees that include community members, representatives from all stakeholder groups etc. The idea is for the community of stakeholders to work together to reduce uncertainty, adjust environmental goals and engage in management activities that improve local conditions and add to the understanding of environmental values generally.

The concept of community participation that is central to Norton's understanding of adaptive management, requires some clarification because it leaves him open to criticism. He could be criticized for assuming that a community always exists to engage with, that if it does exist that it is functional and not dysfunctional and that a community's opinions or values are always informed. In order to address these possible allegations, I will unpack what Norton means when he talks about citizen's advisory committees. Norton writing with Steinemann (Norton and Steinemann, 2003: 533) explains the nature of his public advisory committee like this: "The committee should be inclusive in membership, encouraging participation of representatives from all stakeholder groups, including scientists, representatives of government agencies, and so forth. What are required of the committee are regular participation and an honest effort to understand and solve problems. It is also helpful if the representative stakeholders on the advisory committee can maintain regular communication with their constituencies."

This concept of community used by Norton and Steinemann above is a construction and very unlikely to exist in the form he envisages in real life. What Norton is referring to here is more like an ideal public advisory committee within a community. Norton and Steinemann (2003: 534) acknowledge this reality and hopes that over time committee members will develop trust, share a common vision and address the needs of competing groups within the community.

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He is idealistic in his assumptions, but I argue that his focus on being inclusive of diverse

points of view, regular meetings and insistence on the setting up of indicators to measure progress towards achieving development paths makes for the best possible chance of success any community initiative might have. In communities where little cohesion exists, I argue this process could facilitate the creation of a community spirit.

Norton's community-driven adaptive management method enables pluralists to resolve a major dilemma in economic decision-making about the environment, i.e. what to do when two value theories like instrumentalism and subjective intrinsic value clash. Instead of trying to convince another party of one's set of values or related facts, the goal in Norton's method becomes trying to find common goals where both sets of values can be upheld when a course of action or development is taken. This set of common goals creates a development path. Then, following a period of experimentation within the development path chosen, the social values and the physical indicators can be reevaluated and action plans adjusted accordingly.

This pragmatic method that Norton labels methodological naturalism is not the product of deduction from unquestionable facts or principles. (Norton, 2005: 203, 204) It is rather a process of contributing towards consensus over time as facts and values are challenged in an open deliberative community. Provided the community is committed to social learning, this method is expected to be able to reduce error and uncertainty. Instead of using deduction based on prior knowledge, the pragmatic method opens up existing knowledge to scrutiny by an increasing number of truth-seekers in different situations. The pragmatic method therefore sees justification as only provisional, both in science and ethics. Therefore in the debate between the environment and the economy, no single set of economic facts or values, be they intrinsic or use-values, has privileged status above others. They are all subject to experiential testing that occurs in social learning.

This idea of open deliberation within a community about values, needs and priorities is not unique to Norton's work but is also reflected in the work of development economist Amartya Sen, who makes the point that the human condition is such

that one's
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understanding of one's own needs and values depends on one's interaction with others. Human beings therefore need public social and political interaction because they need the knowledge and wisdom of others to develop their own values. (Sen 2002: 79)

Similarly, Edgar Pieterse in a discussion on urban development, makes references to the need for epistemic communities to emerge that challenge existing viewpoints and propose alternative approaches to development. He believes the function of these communities that ought to be situated on the periphery of grassroots, academia, civil society, business and government should be to bring understanding to the fore. Pieterse believes these communities should engage with economic roleplayers and economic processes because this will allow for progress in the achievement of social and environmental objectives. (Pieterse, 2008: 150)

The question that emerges in this part of the discussion is how this open-ended process can be accommodated in economic decision-making. Economic decision-making is driven by the market economy where decisions are taken between individual market players. I suggest that it would not be wise to interfere with the operations of the market mechanism itself but rather to include these interactive processes in social institutions that influence decision-making within the market mechanism. Examples of these include the national budgetary processes in a country, agricultural boards, business and trade associations and trade union structures.

In a process of inquiry, individuals will change their beliefs or values in reaction to new experiences. This makes pragmatic reasoning not a matter of logic, but more a matter of psychology and sociology. There is therefore a switch from an emphasis on deducing truth, to encouraging a process that promotes public discussion and deliberation as a necessary basis for choices. Norton's (2005: 150) adaptive management therefore focuses on how people learn, on how consensus is formed, and what

vocabularies people use in public discussions.

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In the pragmatic method, ontological issues of the nature of value and right action are suspended. It is not about doubting every belief and value of the community, but rather about bringing the best science available to bear upon areas of disagreement. Throughout Norton's discussions of his naturalistic/pragmatic method he makes use of Neurath's analogy that the human search for knowledge is like sailing on a boat in need of repair. (Norton, 2005: 107, 152, 153, 279) One has to fix this boat as we are sailing on it. We don't have the luxury of getting off the boat but have to repair it as leaks are sprung, shifting planks around, changing values and adjusting our understanding of facts as we try to stay afloat.

Many of the value clashes that occur in economic decision-making between instrumental environmental values and subjective intrinsic environmental values could be resolved when the question of scale is taken into consideration. Norton (2005: 219) believes that one of the biggest mistakes made by moral monists like Callicott is that they fail to see that human values exist on different scales. He states that Callicott tries to solve the moral dilemma of humans versus nature on a single scale. Norton believes we should first correct the short term way in which humans think by thinking in a multi-scalar level. In this new world, Norton states that value exists on multiple levels and unfolds over different horizons, because it is enmeshed in different dynamics.

These different demands are not in direct competition with each other because they exist on different scales and different dynamics are involved in their production. Norton states: "the consumptive values of human individuals exist on a short term economic scale and are associated with a relatively rapid, individualistic economically organised dynamic, whereas human concern for ecosystems and species ('the mountain') unfolds in a multigenerational frame of ecological change." (Norton, 2005: 219) If Callicott located

individual and multi-generational values on different scales of the system, he would avoid accusations of environmental fascism where ecosystem interests override the values of individuals or the alternative problem, where the needs of individuals are seen to override those of ecosystems. (Norton, 2005: 220)

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Norton (2005: 220, 221) borrows hierarchy theory from systems theory to develop a management tool to help make these multi-scalar decisions. Hierarchy theory has two defining assumptions (Norton 2005: 221): "firstly that all measurement must take place from somewhere within a complex dynamic system that forms an environment" and secondly that "smaller subsystems change faster than the larger systems that form their environment". So what on one scale is an agent, on another scale is a collective agent acting in a larger dynamic. The first scale is the focal scale from which something is being studied. If one moves below a level one is able to observe the component elements of that focal level. If, however, one would like to observe the larger context by which the focal level is being constrained then one goes one above. 19

To illustrate how these focal levels could be explained in hierarchy theory, I will use the example of savannah grassland. All savannah grasslands have two components: trees and grass. These components, trees and grass, exist in a specific ratio in savannah grasslands and form the focal level below the focal level of savannah grassland. They are what constitute it. If elephant numbers increased in savannah grassland and reduced the amount of trees drastically, it would no longer be considered savannah grassland. (Joubert 2006: 64) Alternatively, if carbon dioxide levels in the atmosphere increased drastically in the region and caused trees to grow extensively, then there would be no open space for grass to grow. The area would no longer be considered savannah grassland but forest. This time the change in the savannah grassland would have come from a higher focal level, that of atmospheric conditions.

If I wanted to study the affect of global warming on savannah

grassland, I would need to isolate a few typical savannah trees in a hothouse and increase carbon dioxide levels to test their growth rate. If I did this I would be isolating a smaller subsystem or component of the savannah grassland, i.e. trees, to see how it was affected by increased levels of atmospheric carbon dioxide.

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See Appendix 2a and 2b.

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This would enable me to make predictions about the effect of increased levels of carbon dioxide on savannah grasslands in general. Joubert (2006: 62) records that this was in fact done by South African National Biodiversity Institute and they found that the trees grew robustly.

Using this idea of scale, Norton (2005: 239, 240, 246, 247) introduces a third concept in his understanding of a pragmatic approach to environmental values within economics, that of communal goods. He distinguishes communal goods from individual goods and public goods. He sees communal goods as emerging and being counted on the scale of the community. They exist on a different temporal scale than do individual goods, and they can, in principle, survive many transfers from individual to individual. Unlike public goods, communal goods cannot be divided into individual goods. Norton (2005: 241, 242) explains the difference using the example of Hardin's tragedy of the commons.

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The pastures might be destroyed by individual herders who choose to invest the gains they make in the destruction wisely, like sending their children to college, thereby freeing those children from dependency on the pasture. However, the community would be poorer as the pasture and the opportunities associated with it are destroyed. The way of life offered by the pasture would be destroyed for the future generation. Norton concludes that the community would be poorer.

Norton (2005: 246, 247) suggests that we could consider environmental problems as problems of finding a balance between individual goods and communal goods. Individual goods are well captured by economic analyses and they unfold over a short-term horizon of less than five years. Communal goods on the other hand are longer term and have to do with the kind of community that people would like to live in and what the community will be in the future. These goods will be preserved if the appropriate options and opportunities that have shaped the community and its culture are preserved.

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The tragedy of the commons occurs when people seek individual gain at the cost of shared resources, eventually leading to the destruction of the common resource. (Hardin 1995: 332, 333)

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On one level there is an overlap between Callicott's understanding of the relationship between human needs and ecosystem obligations as the annual growth rings of a tree, added from the outside (Callicott, 1999: 168), and Norton's idea of a multi-scalar environmental reality. Callicott admits that his view is pluralistic in the sense that it involves multiple overlapping and competing community-generated duties and obligations, but it is not pluralistic in the sense that there is more than one metaphysics or ethical framework. (Callicott, 1999: 169) The commonality in their approach is that they both turn towards the "community" as the source of developing alternative ways of valuing the environment within the economy. Callicott sees human beings as having evolved community sympathy through an evolutionary process that has resulted in a sophisticated society with a variety of moral obligations. Callicott's idea of concentric rings also implies some sort of scalar analysis.

However, where Norton and Callicott differ markedly is on how they arrive at the community values. Norton's approach is focused on exploring and facilitating the

diversity of ways in which we value the environment within the community, whereas Callicott aims at developing a comprehensive theory that is able to order the multitude of ways that we value the environment within the community. Callicott (1999: 180) defends ethical monism

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as being more likely to stimulate debate in environmental ethics. This

is because every attempt to develop a coherent ethic breaks new ground in environmental ethics by proposing a new take on things.

However, Callicott (1999:175, 180), while he supports interpersonal pluralism sees intrapersonal moral pluralism that proposes that individuals should select a theory that fits the practical problem at hand, as doing the opposite, stifling debate in moral philosophy. I think Callicott makes a valid point here. In attempting to explain a new theory one develops new understandings and challenges old ways of perceiving morality.

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Wenz (2003: 225, 226, 227) describes Callicott's ethical monism as a form of moderate form of pluralism

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However, I believe one also runs the risk of becoming stuck in the process of formulating the perfect theory, and not being able to move towards practical solutions. It is here where I think Norton's approach can help one become "unstuck" in environmental ethics. Norton does not try and find the perfect theory because his end goal is the fixing of a particular environmental problem rather than the development of a comprehensive theory. As a pluralist, he does not believe that there is one theory that is able to explain a moral problem for all time. Instead, Norton (2005: 272) is open to using the ways in which people currently perceive their situation as a starting point and then working towards common social goals so that action plans can be achieved.

He is not practicing opportunistic moral relativism where all theory is equally valid and you pick one that best portrays your point of view, it is rather a process of trial and error experiential learning that is used to validate moral values. It also involves negotiation with other people and jointly working towards a temporary consensus so as to move towards action.

Norton's ethic (2005: 265, 266) differs from other interactive decision-making theories like game theory. Game theory, which is popular in mathematics and economics, attempts to compute answers for people's preferences. The accuracy with which it can do this assists decision-makers in preventing worst case scenarios. Game theory is able to do this because it has some basic assumptions, i.e. that each player in the game acts as a selfinterested utility maximiser; each player acts in full knowledge of the situation; that the rules of the game are given and non-negotiable and that each player knows the aforementioned rules. Without these "givens" game theorists would not be able to produce the accurate answers they do.

However, adaptive management as described by Norton, would never be able to achieve the level of accuracy in environmental management that game theorists claim for their approach. This is partly because the above-mentioned ground rules of game theory cannot be guaranteed in environmental management situations. Adaptive management decision-making models operate in contexts where it is often impossible to have full
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knowledge of the situation at hand, and one cannot assume that all of the other stakeholders in the decision situations are acting as self-interested utility maximisers. Environmentalists, for example, might be acting out of concern for future generations or the preservation of an ecosystem or species, rather than out of concern for themselves.

Secondly, in game theory the rules written for the game constitute the game. (Norton 2005: 268) However, in adaptive management even the rules of the game are open to

negotiation.

Norton (2005: 268, 269) uses the following example of a watershed partnership trying to reduce sedimentation in a nearby stream. In this example, two factions are arguing about what the biggest cause of the sedimentation is; logging and the logging roads near the stream, or downstream livestock grazing near streams. They set up two experiments whereby a 20 year moratorium was placed on logging and the building of logging roads near streams in exchange for supporting higher cutting ratios in nonriparian areas. Secondly, the government provided an incentive for farmers to adopt best practice grazing near rivers. These two studies will provide scientific information for the community and government to make a better decision in the future about the management of sedimentation entering streams.

Norton's approach to making environmental decisions with multiple values in the economy is illustrated by the following example: if there was a debate between a group of environmentalists and a golf-estate developer on the value of open environmental space in the peri-urban outskirts of Stellenbosch, a large town in the winelands of South Africa, then the social good in question would be open space. The indicator could then be tracked by kilometres squared of open land. The criteria for that open space could be percentage of open land that is fynbos, and percentage of open land that is golfing estate. A multi-criteria analysis could allow for 40% of golf green and 60% of fynbos in the total amount of surface area. This indicator could be easily calculated by aerial photographs that represent the amount of open space available. The two percentages represent different criteria that make up the indicator 'open space area' which are linked to the social good of open environmental space.

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Norton (2005: 269) divides this process of choosing and implementing what criteria to apply into two phases: the action and the reflective phase. The action phase involves implementing the criteria, and in the reflective phase, the social goods, indicators and

criteria are chosen and weights or priorities are placed on the various criteria (percentage of golf greens and percentage of fynbos) to determine their importance. This process could be done in several ways: one could ask experts once off or iteratively to state their preferences and weigh the criteria accordingly, one could ask experts and lay people to state their preferences and weigh the criteria either once off or iteratively.

Norton (2005: 270, 271) favours expert and lay people jointly being consulted for their preferences and weighing the criteria on an iterative basis. This allows for inclusivity of opinion and opportunities for experts to report back on their recommendations which are translated into non-technical language for lay people to comment on. In Norton's (2005: 276) multi-criteria decision-making model experts lose their special status. There is no falling back on once-off input from experts. There is also no experience-independent, best solution that can be calculated algorithmically. Adaptive management dilemmas are not suited to these kinds of solutions. This is because adaptive management situations reflect the "wicked" character we discussed previously in that they represent a diversity of multiple interests and viewpoints that defy one correct answer for all time. Instead, as discussed above, they are interactive even at the level of how preferences should be weighted in a criterion.

Norton (2005: 272) is of the opinion that a community of truth seekers with varied perspectives and values, who are united in their desire for a co-operative solution, do not need a "best solution", and that they are likely to achieve their goal, provided they are open to learning and revisiting their goals through experience. He is sceptical of a decision model that aims at experience independent solutions, and instead advocates slow progress through social learning over time.

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F. Conclusion

I have argued from a theoretical point of view that moral pluralism in the form of

environmental pragmatism as discussed by Bryan Norton offers us a useful way of valuing the environment within economic decision-making. I say this because it develops a way of including immediate individual consumer preferences (the subject matter of neo-classical environmental economics), the longer-term ecosystem valuations (the subject matter of ecological economics) as well as the non-anthropocentric values (the subject matter of intrinsic value theorists) without falling back on a priori, foundationalist arguments.

Using the debate between Callicott and Norton, I call for an ethic that moves away from imposing a set of values on people. The reasons for this are two-fold: firstly, that it is arrogant to tell people how they should value the environment in which they live, and secondly because it seldom works. It is far more useful to start with the ways in which people do value the environment in a particular economic decision-making context and introduce them to the impacts of these values over the long term. Norton's approach is empowering because it starts where people are at, i.e. with their own understanding of the environmental value, and shows them a way of monitoring, improving and possibly adapting their values and economic structures to better reflect the kind of end results they have in mind.

Norton's ethic is able to achieve this by adopting a pragmatic environmental ethic that subjects both facts and values in a particular context to the test of experience. This means that everything is subject to change, including the environmental values themselves that can sometimes become outdated or inappropriate. The contextual focus provides a real-life backdrop against which development paths can be measured and experimented with in the short, medium and long term. This extensive time focus in a specific location, enables one to express the full range of ways in which people value and rely on their environment.

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Moreover, by using an interactive, open-ended multi-criteria decision-making tool, these

various social values can be put to the test using indicators that are sensitive to moral pluralism.

In chapter three, I will demonstrate how effective Norton's adaptive management ethic is by using it to analyse a major economic decision-making tool, the South African national budget. The analysis will involve two distinct phases: a critical phase and a constructive phase. In the first phase, I will use Norton's guidelines of experimentalism, multi-scalar analysis and localism to identify gaps in the budget process, and in the second phase, I will use it to propose constructive changes that could be included in the process to better improve its ability to include environmental considerations in decision-making.

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CHAPTER THREE: DEMONSTRATING THE INSIGHTS OF ENVIRONMENTAL PRAGMATISM ON THE BUDGET PROCESS

A. Introduction

In chapter 3, I test the insights of adaptive management by applying the key characteristics of it in an economic decision-making context – the South African National Budget. I look at the South African National Budget in 2005 (SA Budget 2005) in particular. I have chosen South Africa's National Budget to analyse because it is an economic decision-making tool that has a great impact on the lives of people living within a country. It determines the kind of homes people live in, the roads they drive on, whether there is adequate electricity or access to quality health care and education (Abedian, Ajam and Walker, 1997: 13), and moreover, how much of the wild environment will be available for them and their children to enjoy.

In chapter 2, I argued that Norton's guidelines of experimentalism, multi-scalar analysis and localism that are central to his understanding of adaptive management enable one to combine a spectrum of environmental values within economic decision-making, i.e. exchange values, use values and intrinsic ways of valuing the environment. Adaptive

management achieves this by adopting an approach to economic decision-making that is process orientated. It is focused on establishing open-ended, experimental, multistakeholder, iterative processes and structures that allow for maximum communication between experts, the public and other stakeholders about environmental decision-making. In this chapter, I assess to what degree the South African National Budget process for 2005 is able to accommodate these insights.

In the first section of this chapter, I provide a description of the current budget process and its structures, by closely following the 2002 South African Budget Guide and Dictionary written by Alison Hickey and Albert van Zyl. At the time of writing this

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thesis, this was the most recent written source on the budget process available. I update the text where applicable with information from telephonic interviews with researcher Russell Wildeman at the Institute for Democracy in South Africa.

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It is important to

point out that it was not my intention in this thesis to develop new knowledge about the existing budget process in itself

but rather to demonstrate how an environmental

pragmatist approach could assist in addressing the environmental challenges faced by a budget process like the South African National Budget. It is for this reason that I did not find it necessary to conduct a series of interviews with roleplayers on the workings of the current budget process.

However, what did provide a useful context to the issue of environmental values was a series of interviews that were conducted by myself and Prof Johan Hattingh of the Department of Philosophy at Stellenbosch University in a survey on the ethical issues surrounding decision-making in Cape Town and surrounds in 2004. The survey, among other issues, demonstrated the diversity of ethical values among environmental roleplayers, as well as a lack of confidence in certain

environmental decision-making processes. (Seeliger and Hattingh 2004: 54, 56)
The second section discusses Norton's criteria of evaluation: experimentalism, multiscalar analysis and localism, in relation to budget decision-making process, showing what broad areas of concern these tools of analysis highlight in the current budget process, regarding environmental valuation. In my discussion of the guideline of experimentalism, I show how the current budget process, though embedded in democracy, is not open to environmental pragmatism's contextual understanding of truth but instead relies on political authority to determine truth outcomes. Multi-scalar analysis, as a criterion of economic decision-making within an adaptive management approach, shows how the SA Budget 2005 only operates on one focal level of environmental concerns, that of meeting the immediate market driven and survival needs of South Africa's growing population.

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The book 2002 South African Budget Guide and Dictionary by Alison Hickey and Albert van Zyl that was published by Institute for Democracy in South Africa (IDASA) has not been updated since 2002. IDASA's previous book on the budget was by Abedian, I. Ajam, T. and Walker, L. 1997, Promises, Plans and Priorities. South Africa's Emerging Fiscal Structures. Cape Town: Institute for Democracy in South Africa.

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With the help of the third guideline of adaptive management, localism, I discuss how a local orientation would allow for a more accurate identification of environmental problems and their alleviation.

In the third section, I look at the kinds of changes that these criteria would suggest in the current structure and functioning of the South African National Budget process, what new bodies these guidelines might propose or what new processes they might suggest .

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Some of the suggestions include that the budgetary process needs to be more open to experimental learning, i.e., that it should include ways of

measuring the environmental impacts of decisions in the short and longer term. Other suggestions that are discussed include that local government should have a larger role to play in deciding how revenue is spent and, secondly that there should be improved cooperation between the different spheres of government.

In the fourth section of the chapter, I look at what the likelihood is of having any of these insights taken up in the current budgetary process. I suggest that some of the insights have already been articulated in government documents, while others have been recognised as needs that have yet to be adequately addressed.

B. Describing the budget process

1. Introducing the process

The South African National Budget is the outcome of a negotiation between national, provincial and local government on how the revenue collected by the national government should be spent on addressing the needs of the people of South Africa. Each year this negotiation takes place. The national government raises the revenue through company tax, personal income tax and value-added tax. The provincial government has minimal power to tax. None of their taxes can interfere with local and national taxes. A total of 3.2% of their revenue comes from taxes they collect. The provincial government

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See appendix 1 for proposed new bodies and appendix 3b for proposed changes to the budget process

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is only permitted to borrow money for capital expenditure and they are only allowed to do so domestically. Local government, on the other hand, has extensive powers to tax and they may borrow capital. They receive 92% of their revenue themselves through instruments like property rates, utility fees and levies. However, those municipalities that are not able to collect sufficient revenue to cover their needs rely on national government more heavily. (Hickey and Van Zyl, 2002: 1-6, 18, 19)

All the taxes collected by national government are paid into the national revenue fund. The money in this fund is paid out through two means: statutory appropriations and votes. Statutory appropriations are amounts that government is already committed to by law and do not need to be voted on every year. These are things like the salaries of members of parliament and judges, interest on government loans, the contingency reserve of government for unforeseen costs and money for skills development that is collected via the skills development levy into the National Revenue Fund and then sent to the National Skills Fund. There are also other standing appropriations that are also paid on an annual basis. The rest of the revenue is then available to be claimed through the individual votes or government departments in Parliament. Parliament then votes for these funds to be spent in the various government departments, hence the name votes. (Hickey and Van Zyl, 2002: 6, 11, 12)

2. Who are the main roleplayers?

The Financial and Fiscal Commission is a body of 22 members that has been created by the Constitution. It is regarded as an independent advisory body. Its members, who each serve a five year term of office comprise: nine people each of whom have been elected from the Executive Council of a province; 2 people who have been nominated by the South African Local Government Association (SALGA) and eleven who are appointed by the President.

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The Financial and Fiscal Commission helps to compile the budget by making recommendations on it to Parliament, Provincial Legislatures and the Budget Council. According to Section 9 of the Intergovernmental Fiscal Relations Act 1997 (IGRA), the Financial and Fiscal Commission is required to make recommendations ten months prior to the tabling of the budget. (Hickey and Van Zyl, 2002: 44, 45)

The Budget Council is one of the principal discussion forums in the run up to the tabling

of the budget. They focus mainly on fiscal and financial matters. It consists of national and provincial politicians. Its main members are the national Minister of Finance, the Deputy Minister of Finance, the nine provincial Ministers of Finance as well as Treasury advisors, the Director General of Finance and the Heads of Treasury. The Financial and Fiscal Commission are allowed to attend as observers. The Minister of Finance is legally required in terms of the Intergovernmental Fiscal Relations Act of 1997 to convene the Budget Council twice a year. (Hickey and Van Zyl, 2002: 45, 46)

The Budget Forum is another mechanism for consultation on the budget. It consists of the Budget Council and five members of the South African Local Government Association (SALGA) and one representative from each of the provincial associations. It discusses fiscal and financial matters pertaining to local government. The Minister of Provincial and Local Government can attend meetings as an observer and the Minister of Finance is required to ensure it convenes at least once a year. (Hickey and Van Zyl, 2002: 46, 47)

The Budget Forum is also a mechanism for consultation on the budget. Whereas the Budget Council discusses matters that relate to provinces, the Budget Forum specifically focuses on matters that affect local government. It comprises the Budget Council, and in addition five members of the South African Local Government Association (SALGA) and one representative from each of the provincial associations. The Minister of Provincial and Local Government can attend the Budget Forum's meetings but is not officially a member. Much like the Budget Council, the Minister of Finance is required to convene the Budget Forum twice a year.

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The Ministers' Committee on the Budget (MinComBud) is a technical sub-committee of the Cabinet specifically tasked with budget matters. It is an important roleplayer in the drafting of the budget and keeps track of how it develops. It ensures that the entire document is in line with the overall objectives of government. (Hickey and Van Zyl,

2002: 47)

The Minister and Ministers of the Executive Council of Provinces (MinMECs) are political forums that are convened for sectors that are both provincial and national competencies like health, education, welfare and housing. They comprise the national Minister and the nine provincial Ministers of the Executive Council for the specific sectors. Their job is to keep a watch on what the priorities in each sector are and how they can meet these needs within the provinces. (Hickey and Van Zyl, 2002: 47, 48)

The Budget Council, one of the main discussion forums for the budget discussed above, is supported by the Technical Committee on Finance and the Joint Sectoral Technical Committees (4x4s). These teams of officials discuss policy scenarios for the different sectors, any service delivery problems or other budget difficulties. They are called 4x4s and include four national and four provincial officials out of which line and Treasury officials are also represented. Representatives from each province are not found on every 4x4, however, each province is active on at least one 4x4.

It is their unique task to bring together Treasury and line departments at national and provincial levels. They are permanent bodies that meet throughout the year and take a long term view on the budget as well as on issues that impact on it. There are 4x4s for health, education, welfare, personnel, justice as well as infrastructure and transport. They also focus on improving intergovernmental relations and facilitating information exchange. However, they act in an advisory capacity and have no decision-making power. (Hickey and Van Zyl, 2002: 48, 49)

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Sometimes departments need additional funding for events that could not have been anticipated. The Treasury Committee hears requests for these additional funds. The Minister of Finance chairs the committee which includes a few selected cabinet ministers. It meets in October and its decisions are tabled in Parliament in late October as part of the

Adjustments Estimate to the original budget. (Hickey and Van Zyl, 2002: 50)

Parliament discusses the budget through the Parliamentary Budget Committee, an ad hoc committee that holds hearings on the Medium Term Budget Statement. The Medium Term Budget Statement is released in November and the Parliamentary Budget Committee tables a report on this in Parliament. The Parliamentary Budget Committee comprises 15 members from the National Assembly (9 from the ruling party and 6 from members of the Opposition) and 8 members of the National Council of Provinces (5 from the ruling party and 3 from members of the opposition). (Hickey and Van Zyl, 2002: 50)

3. How is the national revenue divided?

Hickey and Van Zyl (2002: 8) separate the division of revenue into two phases: the vertical and horizontal division. The vertical division divides funds between national, provincial and local spheres of government. About 41% of revenue stays with national government, 56% is earmarked for the provinces and 3% is divided between municipalities. The horizontal division divides the money for provinces between the nine provinces and between the municipalities.

Hickey and Van Zyl (2002: 19) point out that the vertical division of revenue between spheres of government is not based on a technical formula. This is because it is a political judgement based on what the national government prioritises, the responsibilities of each sphere of government and the capacity of each sphere to raise its own revenue. (Hickey and Van Zyl, 2002: 19)

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The revenue is secondly divided horizontally between provinces and municipalities. The Constitution makes provision for each province to get an equitable share of the revenue raised nationally. This is so that the provinces are able to perform the basic services allocated to them. A total of 88.7% of their transfers from the national are received in this way. The remaining 11.3% of money transferred

to provinces are conditional grants. While provinces are able to determine independently from national how their equitable share is spent, over half of their money is spent on salary bills. This means they have limited powers to decide on the allocation of money. (Hickey and Van Zyl, 2002: 21, 22)

The size of the equitable share of each province is determined by a technical formula based on the relative need and different demographic and economic profiles of each province. The formula is intended to be redistributive so that the poorest provinces benefit the most. The technical formula has seven components: education, health, welfare, basic population, backlog, economic output, and an institutional component. Conditional grants to provinces provide funds for particular priorities or interventions defined by the national government. The national department is still responsible for monitoring, compliance and assessment of whether goals are achieved. (Hickey and Van Zyl, 2002: 21-32)

Local government only receives eight percent of its revenue from intergovernmental transfers. Some of these come from provinces but the most significant come from national government. National government transfers funds to local government through equitable share and related transfers, municipal infrastructure transfers and recurrent transfers. The equitable share formula for each local government is based on the number of poor households in all municipalities (referred to as the S-grant) and the infrastructure needed to maintain a functioning administration (referred to as the I-grant). It makes up 57% of the total amount national government transfers to municipalities.

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Municipal infrastructure transfers make up 35% of national government transfers to local government and recurrent transfers that support municipal capacity building and restructuring make up to 8% of national government transfers. (Hickey and Van Zyl, 2002: 34-37)

The budget makes provision for longer-term planning and co-operation between ministries by including 3-year spending plans. This is expected to enhance stability, encourage investment, improve transparency and facilitate programme evaluation. The Medium Term Expenditure Framework (MTEF) is the tool used to determine the spending for the present financial year and the two following years. The Medium Term Budget Policy Statement (MTBS) is the written document that explains the thinking behind the framework. The content of the MTBS includes the macro-economic policy and outlook, the fiscal framework, the taxation policy and implementation, medium term expenditure projections and provincial and local government finance.

It describes the equitable division of revenue between the spheres of government, gives the rationale for that division in terms of the macro-economic context and assumptions that spring from that and provides spending estimates for the next three years. These spending estimates are the starting point for the next year's detailed budget. (Hickey and Van Zyl, 2002: 38-42)

4. The drafting of the budget

The budget process starts a year before the start of the financial year in April but it does not conclude when a new financial year starts. This is because Parliament only approves the budget when the financial year has already started. Similarly, the Adjustments Estimate is only tabled once the year is underway. The start of the budgetary process begins when the political executive uses the government's social, economic and developmental priorities to determine the broad medium-term spending priorities. The MinComBud, the Budget Council, SALGA and Cabinet discuss these priorities at the meetings of the MinComBud, the Budget Council and the Budget Forum.

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recommendations of the Financial and Fiscal Commission are considered. The Financial and Fiscal Commission is expected to have sent this 10 months prior. (Hickey and Van

Zyl, 2002: 51, 52)

Using the previous year's medium term projections, the Treasury can anticipate expenditure for the year and possible shortfall. These projections enable it to make "resource envelopes" for the various departments to begin working within. These "parameters" are then handed down to the departments. (Hickey and Van Zyl, 2002: 53)

The national and provincial departments, between April and August, prepare their Medium Term Expenditure Frameworks (MTEF) from within the "resource envelopes" that Treasury hands down. Specific guidelines and formats are sent by the Treasury in mid April that the national departments must adhere to in the preparation of their budgets. Provincial Treasuries also circulate their own guidelines and deadlines for provincial department MTEF submissions. Each national department and provincial department prepares its own MTEF budget submission in line with government priorities and determines allocations between programmes and line-items. By the end of June both national and provincial departments have submitted their detailed draft budgets to their Treasuries. The national Treasury then composes and returns comments on these submissions within four weeks. During July, the national Treasury visits the provinces. (Hickey and Van Zyl, 2002: 53-55)

In June, national departments include submissions of new and existing conditional grants. Between July and August, the macro-economic and fiscal framework is debated between the three spheres of government. These include discussions about spending growth, debt service costs and inflation projections. The 4x4s, that have representatives from national and provincial treasuries as well as national and provincial departments of the relevant sectors, now step in and identify spending pressures on provinces and discuss the impact of conditional grants. (Hickey and Van Zyl, 2002: 56)

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In early August, the Division of Revenue workshop takes place where the macroeconomic and fiscal framework, the main conditional grants

to province and the spending pressures on each sphere of government are reviewed. The Treasury Director-General heads up the workshop and attending are the national department accountants, heads of provincial Treasuries and local government representatives. "Also in August, the MinComBud meets to consider the macro-economic and fiscal framework and the Division of Revenue (DOR). The MinComBud then takes it to an extended Cabinet meeting on the budget attended by provincial premiers in September." (Hickey and Van Zyl, 2002: 57)

In September and October, the national Treasury meets with separate departments. These are called Medium Term Expenditure Committees (MTEC) and are technical committees that hold hearings on the MTEF budget submissions of the national departments. This also happens on a provincial level in a parallel fashion. The function of the MTECs are to help departments prioritise within the baseline allocations. It is here where the department can discuss options for increasing or decreasing their allocations. Recommendations are made following these hearings that are in keeping with the broad government spending priorities and the division of revenue. The recommendations are made to the national Minister of Finance. The fiscal and macro-economic framework and the Division of Revenue as well as the conditional grants, are considered by Cabinet in October. (Hickey and Van Zyl, 2002: 58, 59)

The Medium Term Budget Policy Statement (MTBS) is published in October and then considered by Cabinet and by early November presented by the Minister of Finance to Parliament. This document sets the fiscal planning framework for the upcoming budget and the two years following. It includes the up-dated macro-economic projections, a revised fiscal framework with taxation and public spending and borrowing. It analyses existing spending plans and summarises the likely implications for service delivery. The Adjustments Estimate for the current financial year, after it has been approved by Cabinet, is also presented at the same time as the MTBS to Parliament. (Hickey and Van Zyl, 2002: 59, 113, 114)

Decisions are made about the medium term allocations to national votes and to provincial and local government in November. The Finance Minister then goes to the MinComBud to present any changes to the three year allocations of the national departments. This is followed by the same presentations to the Budget Council and Budget Forum. The national departments and provincial treasuries now work closely with Treasury to prepare the National Estimates of Expenditure before the budget is tabled in Parliament and the provincial Legislature. At the end of January, the Division of Revenue Bill is shown to the Financial and Fiscal Commission and provincial Finance Ministers and Local Government representatives. Cabinet considers the input of these bodies and approves the Division of Revenue Bill. The Bill is then tabled on Budget Day. About two weeks after the national budget, the budgets of the provinces are tabled. (Hickey and Van Zyl, 2002: 60, 61)

5. The legislative process

The budget speech is delivered in the National Assembly in February by the Minister of Finance, who also tables the national budget in Parliament. Two documents, the Estimates of National Expenditure (ENE) and the Budget Review (BR), are published by the national Treasury. The budget is presented as two pieces of legislation: the Division of Revenue (DOR) Bill that discusses conditional grants and the vertical division of revenue between spheres of government as well as the horizontal division of revenue between provinces and municipalities; and the Appropriations Bill that give departments of government the legal right to spend the money allocated to them. The two pieces of legislation are introduced simultaneously. A memorandum that motivates why the revenue is being divided in the manner it is, must accompany the Division of Revenue Bill. Moreover, the Minister of Finance is legally required to explain why it was decided to accept or reject the recommendations of the Financial and Fiscal Commission. (Hickey and Van Zyl, 2002: 64, 65)

The Constitution makes a distinction between money bills (section 77 bills) and nonmoney bills. The Division of Revenue Bill is not a money bill, but the Appropriations Bill is a money bill. The Constitution only allows the Minister of Finance to introduce money bills to Parliament. The Constitution also distinguishes between ordinary bills (i.e. non-money bills) affecting the provinces (section 76 bills), and bills not affecting the provinces (section 75 bills). Section 75 bills do not affect the provinces and therefore the National Council of Provinces has limited powers in approving them. A section 75 bill voted down by the National Council of Provinces and approved by the National Assembly still goes through. This is significant because the Appropriations Bill and Taxation Bills are section 75 bills and therefore the National Assembly can pass them without provincial consent. However, the Division of Revenue Bill is section 76 legislation, and therefore if it is rejected by the National Council of Provinces it must be referred to a mediation committee. If no consensus is achieved in mediation, then the Division of Revenue Bill must to be passed by a two thirds majority vote in the National Assembly before Presidential approval is sought. (Hickey and Van Zyl, 2002: 65, 66)

Section 77 of the Constitution gives Parliament the power to amend money bills. However, the Money Amendment Bill of 2008, the legislation that would enable Parliament to do this, had not yet been passed. Therefore, the National Council of Provinces and the National Assembly committees have the power to hold hearings on the Taxation and the Appropriation bills and recommend a vote in favour or against the bills, but cannot recommend specific changes. Committees and both houses could only theoretically vote down the entire bill but this is unlikely to occur. However, the Division of Revenue Bill is not a money bill and therefore not covered by section 77. Therefore the National Assembly and the National Council of Provinces can technically amend the Division of Revenue Bill. Hickey and Van Zyl point out that from a political viewpoint

this is very unlikely to occur. (Hickey and Van Zyl, 2002: 68, 69)

After the tabling of the budget, it is sent to the Joint Budget Committee. The Joint Budget Committee has seven days to hold public hearings on the budget and compile a report for the National Assembly. Portfolio Committees hold hearings on individual votes. The
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Joint Budget Committee presents its report to the National Assembly and then the budget is debated for about a week on the floor of the National Assembly. Hickey and Van Zyl point out that most of the time is spent debating the budget on the floor rather than examining it more closely in committee. (Hickey and Van Zyl, 2002: 70)

I have thus completed my description of the budget process, and will now proceed to use adaptive management as a critical tool of analysis on the budget process. I will do this using the three central guidelines of Norton's adaptive management approach: experimentalism, localism and multi-scalar analysis, as the tools of analysis. The aim of this analysis is to test the effectiveness of adaptive management as an approach to economic decision-making.

C. Using Norton's adaptive management ethic to critically analyse the budget process

1. Experimentalism and the budget process

The defining characteristic of Norton's adaptive management philosophy is experimentalism. He describes this as "a commitment to constantly use our experience to reduce uncertainty and also to adjust our goals and commitments." (Norton, 2005: 93) An experiment, by its very nature, has three important components. The first of these is that it involves goal-directed activity, i.e., there is a tentative hypothesis that is being tested. All those involved in the experiment are aware of these tentative hypotheses and the whole endeavour is to test or demonstrate their truth claims. The second characteristic of an experiment is uncertainty. It entails an unknown outcome. The tentative hypothesis

could be proved entirely wrong, it could be partially right, it could be entirely correct or it could even reveal the need to reformulate the original hypothesis. It is for this reason that a process of careful observation is used to arrive at its conclusions. It does not rely on authority or conjecture but a process of monitoring and evaluation where the results of the process are compared with the original truth claim.

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The South African National Budget for 2005, like an experiment, has some very clear goals or end outcomes that are determined by the executive. This document describes the intention of the government to grow the economy beyond 4.2 % for the next four years. It discusses the plan of the government to advance social development through reducing crime, providing social grants, clean water, electricity, quality education, health services and houses. The document discusses the need to achieve equity and redistribution by reducing the gap between rich and poor through pro-poor spending, black economic empowerment and promoting African development. Everyone involved in the budget process is made aware of these goals. These goals are written up in the Budget Review and specified in the different departmental votes. (South Africa. National Treasury 2005a: 1-24)

However, the budget process itself, as described in the previous section, is not set up as a tentative hypothesis but rather as a largely unexamined process driven by the authority of the political executive at national and provincial levels, and executed by officials. The outcomes of the projected expenditure are assumed rather than tested. The technical component involves the logistics of distributing the revenue and is facilitated by the Technical Committee on Finance and the 4x4s. The political authority is derived by government policy documents and political budgetary committees like the MinComBud, the Budget Council and the Budget Forum who implement these policies by allocating expenditure to them. While the policies developed, and the outcomes put forward, might be the result of a process of experimental learning, derived

elsewhere, the application of these policies through the expenditure programmes of the department are not designed as an open and tentative process. Put in Norton's words there is no "commitment to constantly use our experience to reduce uncertainty ..." (Norton, 2005: 93)

There are some who argue that the budget is not the mechanism for priority setting and value judgements, but that this is rather the domain of policy-makers who draw up government policy.

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They are of the opinion that the process of policy-making allows for sufficient public participation and evaluation and that the budget process is a more technical process where the political will of the people, as expressed by the Cabinet, is executed. It is not seen as a process that can by its very nature be open to experiential learning, but it is rather a matter of executing prior learning.

However, this argument avoids the obvious value-driven nature of the division of revenue in the budget process. While it is accurate to say that government policy influences expenditure, it is also true that the act of dividing revenue in itself is a value-driven enterprise. Dividing revenue and implementing political will does not take place within separate departments or sectoral think tanks where the diversity of value claims are narrowed. Instead, it occurs within a contested political terrain where political decisionmakers and technical experts are forced to choose between multiple values.

MinComBud, for example, is at the coal-face of implementing government policy in that it is confronted with moral decisions of how to divide revenue between provinces and between spheres of government. It might not appear to be moral decisions because MinComBud's deliberations come guised as technical formulae or conditional grants, but they have significant moral impacts on other people's lives and the environment.

Adjustments to the division of revenue between provinces affect education, health and social service provision in those provinces. Departmental budgetary

spending similarly can significantly impact on people's lives. If the government decides to promote industrial growth and spend less on environmental enforcement, future generations will live and inherit a different kind of future from those of present generations. Political leaders and technical experts involved in budget decision-making directly affect the choices that future generations will be able to make.

The assumption that the budget process is essentially a technical exercise driven by already formulated politically generated policy is conceived from within a monistic framework, i.e. it assumes that economic decision-making occurs in a single value context. It assumes that a decision can be made in a policy document in one context and

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simply implemented in another context without a further value judgement being made. The very contextual nature of truth that is central to Norton's adaptive management, i.e. that contextual truth is dependent on the value and factual claims being made in a particular situation, is ignored in this line of argument. (Norton, 2005: 93, 94)

In the budget process, when the MinComBud, the Budget Council, SALGA and Cabinet discuss spending priorities, they are "making truth", in terms of how "truth" is perceived through the lens of environmental pragmatism. This is evidenced in a very practical way in that these spending priorities have a significant impact on the South African market place, the environment and the social welfare of the citizens of the country. When Treasury uses the medium-term projections of the previous year as the starting point of the anticipated expenditure in the budget for the upcoming year, they are making value judgements about the parameters in which the various departments should organize their spending.

If MinComBud decides to allocate more of the budget to the Department of Trade and Industry (DTI) than they do to the Department of Agriculture (DOA), then they are deciding what kind of economy to promote, i.e. a manufacturing

intensive or an agricultural intensive economy. Similarly, when the departmental heads meet with the programme heads and discuss how these budgetary allocations can best be implemented within their departments they are making implicit value judgements. If the Department of Agriculture decides to allocate most of its expenditure to promoting aquaculture rather than beef production, it is making a decision about what kind of agriculture South Africa will become known for on world markets in the future. This might also have an impact on the landscape and water resources of the country as some cattle farms are down-sized and water becomes more of a priority for aquaculture. If the Department of Minerals and Energy (DME) decides to subsidise wind energy and solar energy and tax the profits of other forms of energy generation, then it will influence the future energy choices of the country.

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The commitment to experience as the only source of reliable truth means that one has to subject the diverse values within an economic decision-making process to the test of experience. This would mean building into the budget process an opportunity to record, measure and evaluate the impact of allocation decisions (i.e. value judgements) on the environment. This would require that factual information was ready at hand about how the current set of expenditure priorities had influenced social, economic and environmental surroundings during implementation.

For example, the Department of Environmental Affairs and Tourism's (DEAT) decision to spend R278.4 million on Marine and Coastal management in 2005 (South Africa. National Treasury, 2005b: 653) needs to be recorded and its impact on existing fish stocks measured. Questions need to be asked about this expenditure and whether it will lead to the planned outcome? What effect did this expenditure have on other variables like the population of perlemoen in the Western Cape? Could this additional expenditure have been better spent in another way like on law enforcement or the development of

another marine reserve in the Western Cape?

Moreover, testing truth with experience cannot be confined to one time period. Norton makes the point that the very tentative nature of environmental decisions is sometimes hidden by the fact that they are often tested in too limited a time period. (Norton, 2005: 93) In order to do justice to a commitment to truth tested by experience, one should think in time cycles that are longer than five years when making decisions about environmental concerns in economic decision-making. This brings us to the second concept that further expands Norton's concept of experimentalism in adaptive management: multi-scalar analysis. In the section below, I will look at what kind of inconsistencies a multi-scalar analysis of the budget process brings to light.

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2. Multi-scalar analysis and the budget process

Norton's second core principle of multi-scalar analysis emphasizes the importance of understanding that environmental problems unfold on multiple scales of time and place. (Norton, 2005: 93) In this section, I will focus on what perspective this insight might have on the budget process. 24

In a table correlating human concerns and natural system dynamics, Norton (2003: 324) distinguishes three time scales: 0-5 years, from 5 years up to 200 years, and indefinite time. He places various human activities within these different time scales. He makes the point that 0-5 year time scale is the scale in which most economic decision-making functions. In this time period, human choices are largely made with an individual focus. I discussed in chapter 1 how the market mechanism functions within this limited time scale by focusing on individual preferences as the preferred instrument to value the environment.

The next time scale, from 5 up to 200 years, is the one in which Norton (2003: 324) places community concerns and intergenerational bequests. It is over decades that cultural practices evolve and behaviour patterns and interactions

with natural systems are entrenched. It is here where much of the cumulative impact of the individual choices made in the market place is felt by communities, e.g. landfill sites filled to the brim with non biodegradable waste because consumers choose non-recycle packaging for convenience. Norton states it is also within this time period where ecological dynamics play out and the interaction of species in communities takes place. Once again if the choices that individuals make, like developers choosing to build on vast tracks of endangered Cape 'fynbos' plant species, are exploitative then impacts like species eradication are possible generational outcomes.

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See Norton's diagrams in Appendix 2a and 2b.

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The third time scale is that of indefinite time, which Norton classifies as the zone that has to do with human species survival. If certain polluting human activities continue unabated for more than 200 years, global physical systems are affected. Global warming is an example of this kind of phenomena. A host of human activities like the burning of fossil fuels and deforestation are causing an increase in the number of greenhouse gases in the earth's atmosphere. These greenhouse gases are trapping heat radiation from the sun, gradually hiking up the temperature of the earth's atmosphere. Scientists are linking these increased temperatures to dramatic floods, droughts, climate changes and possible extinction of species. The earliest recording of accurate temperature readings of the earth's atmosphere began in 1861 (Joubert, 2006: 3), and while this does not quite make the 200 year mark set out by Norton, in principle it reveals how humans over hundreds of years affect the survival of the planet and their own specie.

In Budget 2005, the short term 0-5 year time scale is the focal point. This focal point has very real impacts on longer-term community interests, intergenerational bequests, ecological dynamics and the interaction of species. The focus of Budget 2005 on meeting

the basic needs of South Africans through social grants, extending water and electricity services, quality education and health care and housing (South Africa, National Treasury 2005a: 4) will have some very specific environmental consequences over the long term. Extending water services is a case in point. Water availability and quality is a major area of concern in South Africa's 2006 State of the Environment Report entitled South Africa Environment Outlook A Report on the State of the Environment. The report states that despite a range of management tools being developed less water is available and it is also of a poorer quality than before. This is a source of concern considering that water use is still increasing; almost all exploitable sources are tapped and overall river ecosystems are declining. (South Africa. DEAT 2006a: 3)

The budget process is an attempt to think beyond the short term market choices and plan for a common future for the people of South Africa. It does this by gathering information from a variety of sources and putting in place medium term expenditure frameworks for provincial and national governments. These 3 year plans act as guideline for the planning
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of the budget each year. (Hickey and Van Zyl, 2002: 114, 115). However, what Norton's multi-scalar analysis reveals is that this longer term planning within the budget process is inadequate. It is inadequate, in terms of multi-scalar analysis, firstly because decisions about how to spend on the environment are taken within a too short time scale, i.e. limited to up to three years and secondly because decisions about what kind of industry, agriculture and trade to pursue are taken in isolation from value choices about the kind of environment South Africa as a society would like to sustain and hand over to future generations.

It is the failure to consider both these two above-mentioned aspects of multi-scalar analysis that result in economism

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or the reduction of all environmental value to

economic needs, those operating in a 0 to 5 year time period. This means that lifestyle choices about what, how much, and what kind of environment South Africans would like to sustain, e.g. wilderness areas, wetlands and indigenous species, are only taken into consideration in the Department of Environmental Affairs and Tourism (DEAT) budget and are not related to environmental choices made in the Department of Trade and Industry (DTI). This makes their maintenance and future existence tenuous. Multi-scalar analysis would be able to create a development path that linked short term considerations at a particular time to longer term outcomes over an extended time period. Moreover, it would be able to make an argument for considering the impact of a variety of different choices in a particular time period on each other and on the next focal level, e.g. if one chose accelerated industrialism with reduced social and environmental spending one would develop an economy that was quite different to one based on the opposite.

If the concept of multi-scalar analysis was introduced into the budget process it would require decisions about trade and industry to be taken in due consideration with ecosystem opportunities and limitations. Moreover, multi-scalar analysis requires that the impact of these decisions should be considered over time. To illustrate the combination of these impacts, consider the example of deciding where to locate a refinery. It would have

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A term used by Norton in his book *Sustainability: A Philosophy of Adaptive Ecosystem Management*. He uses it to explain why economists are not able to engage effectively in environmental problem-solving. (Norton, 2005: 166, 180)

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to be done with due consideration for the ecosystem limitations in that area and its ability to absorb air pollution. While it might not appear to be a problem within a two year time period, perhaps when considered over a ten year time period in relationship to other industrial activities in the area, it might push the capacity of an

ecosystem to its limit, causing its collapse, and the endangering of the health of human and other species.

The introduction of a second time scale in budgetary decision-making that goes beyond five years is one of the ways of introducing multi-scalar analysis into the process. This second time scale beyond five years makes room for longer term environmental values, like ecosystem concerns, aesthetic considerations and questions of community identity to enter economic decision-making. In the current budget process these considerations are implicitly made, i.e., all environmental values are reduced to short term considerations. The current process does not allow for the deeper questions of ecosystem identity and community values to be expressed like for example: Does South Africa as a nation want to be known as an industrial nation and a wildlife tourist destination? Are these two long term visions compatible or exclusive?

Over this longer time period one can begin to assess if the short term budgetary considerations one makes in the Medium Term Expenditure Framework (MTEF) are supporting the longer term development path that South Africans as a nation have chosen. This would allow participants in the budgetary process to engage in an experimental process of measuring, over time, environmental decisions and comparing these with the projected outcomes of the development paths chosen.

The third time scale that of 200 years and more, is more difficult to accommodate within the budget, but nevertheless, the insights that this scale of time could bring, could be invaluable. The insights from the fields of history, archaeology, astronomy, climatology, geography and anthropology are those that come to mind when one talks of indefinite time. It would be beneficial to the budgetary process to provide the a-political insights of historians, geographers, anthropologists and archaeologists on past civilisations and eras on the choices made in the budget. Looking at African history, geography and

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anthropology over the past 500 years, would give decision-makers

within the budget a bird's eye view of their values in the budget process as well as the factual states of affairs within the larger scheme of things. A historical or geographical perspective might also serve to show up much of the political manoeuvring that occurs in annual budgets for what is.

How multiple scales of place influence each other, is best explained using Norton's (2003: 521, 522) understanding of hierarchy theory explained in Chapter 2. To recap, hierarchy theory has two principles: that all observations and measurements must be taken from some point within a complex dynamic system, and secondly, that smaller subsystems change at a faster rate than do larger systems that forms their environment. A focal scale is the level of a system that is being studied. (Norton, 2005: 221) If one wanted to understand the driving forces behind one focal level you move one scale down and if one wanted to understand the constraints placed on that focal level you move one up to look at the slower changing environment.

In an attempt to explain the focal point of the South African National Budget in 2005 one would need to look at the focal level below to look at what was influencing the decisions being made. Some of them included: a 3.7% growth rate in Gross Domestic Product, the need for means-tested social grants, the need for clean water, electricity and sanitation health, housing, welfare and education (South Africa. National Treasury, 2005a: 3, 4) The inhibiting focal level, or the issues above SA Budget in 2005, were the African, and global, economy. The Budget Review of 2005 discusses a reform agenda for Africa and records the average growth rate for Sub-Saharan Africa expected to reach 5.4 percent, and inflation expected to average at 9.9 percent. Fiscal deficit in Africa was expected to fall to 0.9 percent. Growth in the world economy accelerated from 2.3 percent to 4.0 percent in 2004, largely due to rapid growth in the United States of America and Developing Asia. The USA's current account and fiscal deficit were regarded as a threat to world growth. (South Africa. National Treasury, 2005a: 27, 29)

This situation above presented an optimistic South African National Budget in 2005, however, what was not taken into consideration in this scenario were some pressing environmental concerns. Among the driving environmental forces within the South African National Budget in 2005 were declining air and water quality, degraded land and communities living close to chemical and other industries. (South Africa. DEAT, 2006a: 7) At the environmental focal level above the South African National Budget in 2005, there was grave cause for concern with climate change expected to affect rainfall and bring increased floods and droughts. There was a general loss of biodiversity and ecosystem functioning being recorded and aquatic ecosystems were declining. (South Africa. DEAT, 2006a: 2, 5, 10)

What I have illustrated with the help of the above descriptions of hierarchy theory, is the sheer complexity of making budgetary decisions under multi-scalar considerations. A particular place at a particular point in time has many variables influencing it. Changes that happen on focal levels below and above affect decisions being made at the time and place under consideration. If one includes, along with the multi-scalar approach, the trial and error reasoning suggested by experimentalism, then one complicates the process even further. It is only with the inclusion of the third guideline, localism, that the resolution of complex environmental problems becomes possible.

3. Localism and the budget process

Norton (2005: 93) makes the point that multi-scalar analysis has to be started from a particular place. Adaptation is always local in the sense that an organism survives or perishes in a particular situation. This changes how truth is perceived in Norton's ethic, since truth is always locally based. It is not about finding the ultimate truth for all times and places but about developing practices and institutions that are sustainable in a particular place. Norton (2005: 94) is quick to point out that it is not that regional and global systems have no impact on local systems, but rather that these impacts occur in a

particular place with specific consequences.

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Similarly, much like multiple scales of place, multiple scales of time are also experienced in a specific situation. Time unfolds in a particular place. In both cases, it is the local community that experiences these changes and interprets them within a biophysical setting.

When Norton refers to the term place, he is also referring to the social context. Norton writes: "I build this aspect into my definition by emphasising the local nature of environmental values and by seeing localism as not just a geographic point but a 'place', which is best thought of as a negotiation between the land and human culture." (Norton, 2005: 94) This negotiation happens between stakeholders in a particular biophysical context. They set goals, observe results and then adapt their behaviour and/or make interventions and/or change their goals. (Norton, 2006: 95) In a country like South Africa, where there is such a diversity of cultures and value systems as well as divergent biophysical limitations and opportunities, achieving Norton's kind of action consensus requires repeated debate and interaction.

When the above lens of localism is focused on the current budget process, a major shortcoming of the budget comes to light. Firstly, the current budget process is not designed to take local values or particular biophysical conditions into consideration too closely. Instead, local and biophysical expenditure decisions are lumped together and dealt with in a single category, local government. The category of "local government" is represented in the Budget Forum through "representatives of organised local government". (Hickey and Van Zyl, 2002: 46) These officials are not representing any local group or particular biophysical issue, they are doing so in the general interest of local government. This is not the kind of localised interaction Norton refers to in his concept of localism. By localism, Norton refers to sensitivity to a particular biophysical condition or place and the specific values that are upheld by locals

in this area.

In the budget process, there is no direct feedback mechanism between expenditure decisions about a particular area and changing biophysical or local values. This lack of feedback or iterative discussion makes expenditure decisions a one-way process – top

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down. The problem with this top-down approach in budgeting is that it does not make for efficient environmental problem solving. If complex, multi-scalar environmental problems have to be addressed in the particularities of a place, then an expenditure decision-making structure, that is insensitive to the particularities of a biophysical place, can easily do one of three things: overcompensate by throwing too much money at a problem; or under compensate by not accurately gauging the importance of the problem at hand; or simply spend money on inappropriate kinds of interventions. It is generally understood that careful and constant observation of an environmental problem is the best way of resolving it.

It is equally important to ensure that those directly responsible for using the expenditure to solve the problem at hand are part of the decision-making process when choosing the kind of remedy needed.

If local wisdom or values have not been engaged with

effectively, several problems arise. Firstly, if a group of people have been left out in the decision-making process they may derail or hamper the implementation of a solution, either on purpose or inadvertently. Secondly, if those spending allotted money to address an environmental problem were not part of the decision-making process they might not be properly empowered to administer the solution. Moreover, they might also not take full ownership of sorting out the problem but rather see it as somebody else's problem, i.e. national government's problem to sort out.

In terms of the budget process, the question that arises is how one includes local values and biophysical challenges in a nationally driven process. It would

be simplistic to suggest that all budgeting should be done at a local level because there are some functions like national defence, water management and international relations which have many advantages at being managed at a national level. The management of water at a local level, for example, might lead to the inappropriate damming of water or diverting it from its course, so that the livelihood of another community downstream is threatened. National co-ordination allows in the cases of services like this for better and more efficient distribution.

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I would suggest that Norton's localism perspective on the South African national budget process would require two major changes: a switch towards the empowerment of local authorities to be involved in as much of their own budgetary decision-making and revenue collection as is possible, and where this is not possible, like in revenue decisionmaking about defence, water management and international relations, that there should be improved information feedback mechanisms between local and national government. The current one-way top-down approach allows for wastage on the ground and uninformed allocation decisions at the top level. The idea behind empowering local government and instituting feedback mechanisms within revenue collection and expenditure decisions is to bridge these gaps in the South African National Budget.

D. Improving the budgetary process with adaptive management
1. Experimentalism and constructing a new budget process 26

Norton's guideline of experimentalism requires that the budget process be able to respond to changing values as well as factual states of affairs. This requires access to timeous and accurate information about biophysical conditions and local values. This information needs to be packaged in such a way that one is able to make valid comparisons. An indicator is one such way of doing this. If one, for example, wants to examine how environmentally sustainable a particular government-subsidised programme is that involves the creation of an industrial plant, then one of the indicators one could use is

greenhouse gases per capita. One could find out how much greenhouse gas per capita this particular plant was anticipated to emit. (South Africa DEAT, 2006c: 112) Another indicator could be change in Gross Domestic Product. How many jobs would it create or what would be its impact on Gross Domestic Product?

Indicators vary depending on the purpose for which they have been created. There are social impact indicators that track changes in community profiles: like change in the percentage of population living below the poverty line; change in gender adult literacy

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See Appendix 3a and 3b.

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ratio; or the change in Gini-coefficient

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of income inequality. Potential economic

sustainability indicators include indicators that measure changes in the economy: like changes in the economic growth rates, and consumer price index. Measuring the health and sustainability of institutions within a country could also be monitored by assessing the change in percentage of people voting; change in the number of corruption cases; and change in government service quality. (South Africa. DEAT, 2006c: 111-113)

If the budget process is to adopt the principle of experimentalism, then the controversial division of revenue among the votes, within the votes and between the spheres of government needs to be open to monitoring and evaluation. As discussed above, the use of indicators is one way of going about this. Much like the budget process itself this is likely to be controversial because choosing indicators will indicate a certain choice of values. A group of indicators would collectively form a development path. It is not a neutral process. For example: What constitutes quality of life to people living in Cape Town might be different from what constitutes quality of life to people living in rural

KwaZulu-Natal. An extended family all living communally with many head of cattle might be indicative of the good life to a rural family living in Zululand, whereas a Cape Town family living in the city centre might consider access to movies and the beach as a sign of the good life.

In Norton's ethic, there is no need to shy away from the qualitative and value-driven nature of indicators or any other means of measuring or monitoring choices within the budget process. In fact, in keeping with adaptive management's contextual understanding of truth, it should be embraced. Instead of suppressing the diversity of ways of valuing the environment, the diversity should be sustained. Norton (2003: 538-542) writing with Steinemann illustrates how this could be achieved in an economic decision-making context. They use the example of a timber company that wishes to change an area from hardwoods to another more commercially viable pine plantation against the wishes of a group of residents in the area. Hardwoods were part of an ecosystem and lifestyle which these residents had come to value over generations. Norton discusses the use of an

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The Gini-coefficient is a measure of the inequality of (usually) income distribution. (Pearce, 1989)

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indicator, like percentage of hardwoods per hectare in the demarcated area, as a solution to the problem. A favourable situation for some residents might be 0% pine trees and 100% hardwoods. However, other residents who work for the timber company that are proposing the change, might be dependent on the pine tree for their jobs.

In order to ensure that both local concerns are accommodated an indicator that ensured that at least 60% of the trees remained hardwoods and 40% pine trees might be a negotiated compromise that satisfied both parties and reflected the economic as well as the aesthetic value. If the number of hardwoods per hectare dropped below a certain number then this would indicate that the 60% hardwood baseline had

been violated.

Key to choosing an effective indicator in an economic decision-making context is finding one that is easily measurable. In the above example, hardwoods per hectare could be counted from an aerial photograph taken annually. In the budget process, therefore indicators could be established for certain desirable social, environmental, economic and institutional ends. These indicators should be easily measurable and easily updated.

If these indicators no longer represented community values, then they should be changed so they do. Everything, within the philosophy of environmental pragmatism, is open to revision, not only factual states of affairs but also values. Indicators in the budget process would therefore be open to revision as political decision-making caused social, environmental or institutional goals to change. Much like in the above mentioned example, if the residents of the community no longer valued hardwoods, the percentage of hardwoods per hectare could be lowered.

Within the budget process, the kind of reflection needed to choose indicators is likely to take some investigation and analysis, both of which are time-consuming activities. The budget process is already a time-consuming process and it is unlikely to accommodate this kind of activity. However, while the budget might not be the place to construct, discuss or redesign indicators, this could take place within other forums that are linked to the budget process.

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There are at least three possible forums I would like to propose that could be utilized for this purpose: an Environmental Commission with the same kind of powers as the Human Rights Commission (Foster, 2008); a Standing Committee for Sustainable Development (Foster, 2008) that had the power to interrogate all national government departments; a Department of Sustainable Development tasked with facilitating and funding local, provincial and national sustainability reports; and local municipal environmental advisory committees that compiled and revised local sustainability reports.

It could be the function of these proposed forums (on which I will elaborate below) to articulate the country's chosen development path and ensure that it is monitored with the appropriate indicators. 28

The Environmental Commission's job would be to protect the integrity of South Africa's ecosystems, rivers, soil, marine environment, endangered and endemic species and key strategic natural resources like the Kruger National Park. The Commission would comprise members of leading environmental institutions in South Africa like the South African National Biodiversity Institute, the Oceanographic Research Institute and also long-standing environmental activist organizations like the Wildlife and Environment Society of South Africa. They could play a Parliamentary watchdog role over the country's natural resources (Foster, 2008) through monitoring local and national sustainability reports and comparing these reports to the country's chosen development path as described in municipal integrated development plans and the South African National Budget. It is envisaged that they could have similar powers to the Human Rights Commission in South Africa (South African Human Rights Commission, n.d.) in that they could: investigate complaints of environmental violations; search and seize documents; hold formal hearings; and litigate on behalf of the environment. The Standing Committee on Sustainable Development is envisaged to have similar powers as the Standing Committee on Public Accounts (SCOPA) in South Africa. (Parliament of South Africa, n.d; Foster, 2008) SCOPA currently acts as Parliament's watchdog over how taxpayers' money is spent by the Executive. It can call heads of

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See list of all the proposed committees in Appendix 1.

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government departments and state institutions to account for their expenditure in the Auditor General's Report, and if necessary, recommend that the National Assembly take corrective action. Similarly, the proposed Standing Committee on

Sustainable

Development could use the National Sustainability Report and local sustainability reports as their “documents of accountability” and call departments in government and state institutions to answer for any failures to uphold sustainability indicators and if necessary recommend that the National Assembly take corrective action. They would also report on the achievements of the various departments in making progress towards selected sustainability indicators that were relevant to their departmental activities.

The function of the proposed Department of Sustainable Development would be threefold. Firstly, to facilitate the generation of sustainability indicators through the funding of local sustainability reports, provincial sustainability reports and national sustainability reports. The proposed department would need extensive data management services and would also be responsible for collating the information from local sustainability reports to form the national sustainability report. Secondly, the proposed department would be responsible for ensuring compliance within government departments with regards to sustainability indicators. This could be achieved with the help of the above-mentioned Standing Committee on Sustainable Development who would report to Parliament on the progress of departments using the local, provincial and national sustainability reports. Thirdly, it is also envisaged that this department act as an environmental protection agency and be responsible for prosecuting transgressions of environmental legislation. It is proposed that they should take over and expand the functions of the current enforcement directorate within the Department of Environmental Affairs and Tourism in South Africa.

The function of the local municipal environmental advisory committees would be to oversee the development of the sustainability reports and sustainability indicators at a local level. These committees would consist of representatives of all stakeholders in local communities including scientific experts in local conditions and local government representatives. They would oversee the compiling of sustainability reports that were

commissioned by the proposed national Department of Sustainable Development as well as the revising of sustainability indicators. They would assist in ensuring that the sustainability reports and indicators represented local values and environmental, social and economic concerns. Norton writing with Steinemann (Norton and Steinemann 2003: 533, 534) emphasizes that these kinds of committees should be inclusive in nature and meet regularly as a committee, and also with the separate constituencies they represent. This will ensure that they remain in touch with local values and are also able to revise indicators effectively.

In this thesis, I suggest that the sustainability indicators generated by the sustainability reports overseen by this local environmental municipal advisory committee also be included in the integrated development plans of municipalities, and be used to guide local development. Additional environmental budgetary committees that could use the information of the above-mentioned sustainability indicators in their deliberations about the budget could include:

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An Environmental MinMec, i.e. a committee comprising the national minister for DEAT and provincial ministers of the environment;

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An Environmental 4x4 or joint technical committee. This committee would specifically look at environmental concerns in intergovernmental relations;

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An Environmental Cabinet Cluster. This Cluster would be a meeting of most national department ministers (most departmental activities have an impact on the environment);

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An Environmental Directors-General Cluster. This body would discuss

the implementation of the deliberations of the Environmental Cabinet Cluster.

Currently, MinMecs, 4x4s and Cabinet Clusters exist for several other joint sectors in the government but not for the environment. However, other attempts have been made in the past, to address the cross-cutting nature of environmental concerns within government with the establishment of the Committee for Environmental Coordination, the environmental management and environmental implementation plans of departments in government and the establishment of DEAT's Ministerial Technical Committee

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(Mintech).

The Committee for Environmental Coordination is a statutory body that was established through the National Environmental Management Act (NEMA) to promote the integration and coordination of environmental functions in government.

The body comprises: the Director-General of DEAT; the directors-general of those national departments whose functions affect the environment; heads of department of provincial environmental departments; and a representative of the South African Local Government Association. One of the main aims of this committee is to ensure that the environmental management and implementation plans of government departments are realized. 29 (South Africa. DEAT, n.d.)

Mintech was set up to facilitate coordination between the national Department of Environmental Affairs and Tourism and provincial environmental departments. DEAT's website states that they have "working groups that meet regularly to discuss and advise on issues of biodiversity and heritage, impact management, pollution and waste management, and planning and reporting". (South Africa. DEAT, n.d.) The problem with the present above-mentioned initiatives, i.e, Mintech and Committee for Environmental Coordination, is that although they make significant inroads into addressing the need to improve intergovernmental cooperation they are not extensive enough. They are not fully informed by local data or values, nor do

they have sufficient feedback mechanisms to allow for the constant correction and revision of data, that experimentalism would require. DEAT admits to the limited success of these initiatives in the following statement on their website: "Despite these institutions and processes and budgetary increases, finances and personnel still appear to be insufficient to cater for the additional demands of cross-cutting cooperative governance. This is certainly the case in provinces and municipalities, and where there is already variable administrative capacity for managing existing programmes."

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All national and provincial departments in the South African government whose activities require environmental management are required by the National Environmental Management Act of South Africa to prepare environmental management plans (EMPs) and environmental implementation plans (EIPs). (South Africa, DEAT, n.d.)

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What is needed to effectively integrate local, national and provincial environmental management and implementation plans with sufficient budgetary expenditure is a process in government departments that incorporates the two phase experimental process discussed by Norton and Steinemann (2003: 534, 535). Their two phase experimental process involves an action phase and a reflective phase. In terms of a scientific experiment, conducting the experiment would be the action phase and the reflective phase would be the evaluation of the methodology and results of the experiment itself. Similarly, within the budget process the action phase would be the use of the indicators in the drafting phase of the budget where it was decided how to divide the revenue between the government spheres and the departmental votes. The action phase would also occur within the departmental votes as they prepared their budgets within the resource envelopes handed down to them. The reflective phase of the budgetary process could take place simultaneously as the proposed bodies, like the Standing Committee on Sustainable Development and the Department of Sustainable

Development and the Environmental Commission, reviewed the indicators over the previous year, both in committee and in the legislative phase of the budgetary process. The legislative phase of the budgetary process provides a more public and open space in which to debate the various development paths and their indicators.

The drafting phase of the budget would be the place where the data derived from the indicators and other techniques of monitoring core environmental values could be used to inform the choices made by the political executive. In the drafting phase of the budget process, these indicators would present the political Executive, who is mandated by the public to set budget priorities, with useful data to guide them in their choice of a development path.

In the meetings of the MinComBud, the Budget Forum, the South African Local Government Association, the proposed Environmental Cabinet Cluster, the proposed Directors-General Cluster, the proposed 4x4 on the environment, and the full Cabinet meetings, they could assess their previous priorities using the data accumulated from the

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indicators (reflective phase) and make any adjustments (action phase) to their planned expenditure where it was revealed this was necessary. Similarly, when the National Treasury presents the "resource envelopes" to the various departments for their votes in mid-April, they could then justify their choices to the departments using the indicators in the resource envelopes they hand down. If these indicators are linked to a GovernmentWide Monitoring and Evaluation system (GWMES) these would simultaneously involve performance monitoring as well.

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If the development paths and management process presented unexpected results, the drafting phase of the budget would give the political executive and the department opportunities to adjust their development paths according to the data presented.

Thus, there are many opportunities in the drafting phase of the national budget to use indicators:

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Indicators could be used in the meetings of the MinComBud, the Budget Council, the Budget Forum, the 4x4s, the Financial and Fiscal Commission, the Budget Forum, SALGA and Cabinet (with a newly appointed environmental cluster) to justify their prioritization processes for the upcoming year;

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National and provincial Treasuries, when handing down the “resource envelopes” for the upcoming financial year to the departments, could justify the allocated expenditure on the basis of indicators;

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National and provincial departments could determine allocations between programmes and line-items, based on the sustainability indicators and performances of each programme;

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When the National Treasury returns its comments on the departmental submissions it could do so using the information gleaned from the indicators. Similarly, discussions about the macro-economic and fiscal framework could be debated between the three spheres of government using indicators;

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There currently is a Government-Wide Monitoring and Evaluation System in place. The latest version of the strategic framework for sustainable development in South Africa entitled: People-Planet-Prosperity: A National Framework for Sustainable Development in South Africa calls for sustainable development indicators to be linked to the Government-Wide Monitoring and Evaluation System. (South Africa. DEAT, 2008: 51)

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The Medium Term Budget Policy Statement could be justified to parliament using sustainability indicators and articulated development paths;

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In the Budget Review published with the tabling of the budget in February, the government could explain how it had addressed the concerns in the National State of the Environment with the help of sustainability indicators.

The legislative phase offers an important more public opportunity to engage in the reflective phase identified by Norton in his theory of adaptive management. The reflective phase is an opportunity to evaluate the proposed development path, and the indicators monitoring that development path. For example, if the government decided on a development path that advocated a prosperous market-driven economy with a low unemployment rate, it would need a set of economic indicators like a change in economic growth rate, change in the number of exports, change in the Gross National Product and change in the number of jobs available.

However, if the government decided to move towards a development path focused on social equity it might begin to observe indicators like the Gini-coefficient of income inequality more closely and the change in the adult literacy ratio. (South Africa. DEAT, 2006c:111-113) A development path focused on environmental concerns might include the amount of emissions of greenhouse gases as a ratio of Gross Domestic Product or the change in the consumption of ozone depleting gases. Sets of indicators, however, represent distinct development paths in isolation. If only two sets are combined, for example, the economic indicators and the social indicators listed above, then a different development path would emerge to the one that attempted to combine all three, the environmental, social and economic indicators. There are thus a number of possible development paths that could proceed from any one point in time.

The reflective phase of experimentalism, as described above, could occur both

simultaneously and separately from the active phase. It could occur simultaneously in that the debating of sustainability indicators could be a year-long affair in the proposed Environmental Commission and proposed Department of Sustainable Development and

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the proposed local municipal environmental advisory committees mentioned earlier. These forums would create legitimate spaces outside of the budget process to debate controversial value choices and priorities that could feed back into the budget process through the aforementioned additional budgetary committees.

The legislative phase of the budget process potentially provides one with another opportunity to reflect on the development path chosen by government and the subsequent indicators. When the Minister of Finance delivers the budget speech in the National Assembly, and presents that national budget as two pieces of legislation: the Division of Revenue Bill and the Appropriations Bill, Parliament has two opportunities to reflect on the choices made by government. In the case of the Division of Revenue Bill, where government motivates why it divides the money between the spheres of government and the provinces as it does, it is required to do so using a memorandum that explains the rationale for the division to the Financial and Fiscal Commission. (Hickey and Van Zyl, 2002: 64, 65) This could be done even more explicitly with the help of sustainability indicators that motivated the choices that government had made and their anticipated impact on the environment. As mentioned earlier, The Budget Review is the ideal document to discuss the government's prioritization of sustainability indicators. The National Assembly and the National Council of

Provinces, with the help of the

information provided by these regularly updated sustainability indicators, as well as the national State of the Environment Reports, would then be in an even better position to argue for, or against, government policies when they were presented.

The Division of Revenue Bill, because it involves issues that affect

the provinces, is also subjected to the full scrutiny of the National Council of Provinces. This provides a useful second opportunity to look more specifically at provincial sustainability indicators that affect the environment at a provincial level along with a possible provincial State of the Environment Report. The input of the National Council of Provinces is vital because if it is rejected by this structure, it must be referred to a mediation committee, and if it is not resolved at this level, it can only be accepted if it is passed by a two thirds majority vote of the National Assembly. (Hickey and Van Zyl, 2002: 66)

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The Appropriation Bill and Taxation Bills on the other hand are not open to the full scrutiny of the National Council of Provinces because they are money bills and therefore the powers of the provinces are limited. In terms of the concept of experimentalism central to Norton's adaptive management approach, it does not make good sense not to subject money bills and taxation bills to full provincial scrutiny. While it is true that provinces are at this stage unable to levy taxes and their money is allocated via the Division of Revenue Bill, the expenditure of national departments is spent in provinces, and this provides yet another opportunity to scrutinize the environmental, social and economic impact that programmes implemented at a national level have in the provinces. Experimentalism requires that everything is subject to the test of experience: there seems no logical reason why Appropriation Bill and Taxation Bill should be exempt from the double scrutiny of the Division of Revenue Bill. Moreover, in terms of experimentalism this is yet another opportunity for reflection on the choice of sustainability indicators and the current development path.

Moreover, while the National Assembly and the National Council of Provinces are given the power to amend money bills

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by an Act of Parliament, these powers are not yet put into affect. This is because the Money Amendment Bill of 2008 that

will enable this to take place has not yet been passed by Parliament. In effect, this means that Parliament can hold hearings on the Taxation and the Appropriation Bills and recommend a vote in favour or against the bills, but they cannot recommend specific changes. Committees in the National Assembly and the National Council of Provinces could only theoretically vote down the entire bill but this is unlikely to occur. In terms of experimentalism this does not allow for sufficient interaction, discussion or social learning within the process to allow sufficiently valid "truth" to emerge. It could be argued, that until Parliament has the powers of amendment, from an adaptive management point of view that the budget is currently being promulgated or accepted through political authority rather than a democratic process that is sufficiently open to experiential learning.

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The Appropriation Bill and Taxation Bill are money bills. The Division of Revenue Bill is not a money bill. (Hickey and Van Zyl, 2002: 65)

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Currently, it could be argued that the amount of time that is allowed for the scrutiny of the budget in Parliament lends further support to the argument that the budget process is a process of promulgation of already accepted value-based decisions rather than a democratic process that is open to a process of experimentalism. In terms of the current process, the budget is first sent to the National Assembly Finance Committee, then passed to the Finance Committees of each province. (Hickey and Van Zyl, 2002: 70). The Finance Committee has only seven days to hold public hearings on the budget and compile a report for the Assembly. The various portfolio committees hold hearings on individual votes. Following the week of hearings, the Finance Committee presents its report to the whole Assembly and then the budget is debated for about another week on the floor of the Assembly. In total, more time is spent debating the budget on the floor as opposed to scrutiny in committee. The Parliamentary Budget Committee

might see the Medium Term Budget Policy Statement, an indication of budget policy in November, five months before budget day, but it only sees the Estimates of National Expenditure and the Budget Review on budget day. This gives the parliamentary Budget Committee 32 very little time to reflect on the prioritization of the political executive and the departments. Moreover, without sustainability indicators at hand to measure the impact of the programmes of the previous years, it becomes increasingly difficult to make useful and valid suggestions about how the budget could be prioritized.

The problem of insufficient time within the budgetary process to make significant changes in the budget after budget day could be addressed if the Parliamentary hearings of the budget took place more timeously and over a longer time period. I suggest that the proposed Sustainable Development Standing Committee that is anticipated to be tasked with monitoring performance and sustainability indicators, and assisting with interdepartmental and intergovernmental environmental issues, become involved in early November when the Ministry of Finance presents the Medium Term Budget Policy 32

It is important to distinguish the Parliamentary Joint Budget Committee from the Finance Committee. The Joint Budget Committee is an ad hoc committee, that includes the Finance Committee of the National Assembly and the Finance Committee of the National Council of Provinces specifically constituted to listen to hearings on the budget. (Wildeman, 2008)

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Statement to Parliament. This document, which sets the fiscal planning framework for the upcoming budget and the two years following, presents a strategic opportunity for the proposed Sustainable Development Standing Committee to comment on the budgetary priorities. The preliminary comments of the proposed Standing Committee on Sustainable Development could then be fed back to the MinComBud, the Budget Council and the Budget Forum, the whole Cabinet and government departments. At the same time

the Environmental Commission could be given an opportunity to make a submission on the upcoming budget to Parliament. It would also be in a position to debate departmental performance with the Standing Committee on Sustainable Development through its monitoring of environmental indicators throughout the year.

Norton's adaptive management ethic would encourage any process that would allow the diversity of values to be expressed for as long as possible. The reason for this is to be found in how pragmatists see truth as being constructed. Truth is a dynamic process at best a consensus arrived in a context that is framed in a particular time and place. It is always open to change and revision, as different needs and values emerge in any given context. This understanding of truth sees diversity of values and opinions not as a hindrance but as essential to keep the truth claim valid. This is why it is important for adaptive management to always keep feedback action-orientated and open-ended. The action orientation allows for the verification of truth claims and the open-endedness for constant revision.

In the budget process when the government decides how to spend its revenue, it does so amid several different value claims, emerging from different contexts. There are some provinces who might claim they need a greater share of the revenue because they have a greater percentage of the poor in their midst. Similarly, there are some economic sectors who claim they need subsidies, or other special financial incentives to support their activities. There are also certain sectors of the community, e.g. the sick, the aged, the youth, the disabled or mentally handicapped who make very convincing value claims on large amounts of revenue within the national budget.

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In order to ensure that the budget is indeed a truthful reflection of the diverse needs and values of South Africa as a nation, the differing value claims would need to be monitored with indicators to ensure that they are not ignored, or neglected.

2. Multi-scalar analysis and constructing a new budget process

Multi-scalar analysis is concerned about how natural systems unfold over multiple scales of time and place. (Norton, 2005: 92). One helpful way of incorporating multi-scalar analysis in the South African national budget process could be to develop a set of indicators on different focal levels, i.e. 0 to 5 years and 5 to 200 years and relating them to one another, i.e. showing how one set of choices collectively influences and affects those on a higher focal level. This would enable one to monitor how choices on one focal level created opportunities and constraints on another. 33

Currently, the South African National Budget only operates on one of Norton's focal levels, that of 0-5 years. Sustainability indicators mostly operate on the next focal level, i.e. that of 5 to 200 years. I suggest that in order to create a second focal level in the budget process, government should link departmental performance indicators to sustainability indicators. This would enable government to keep track of whether its short term achievements (monitored by performance indicators) were in keeping with its chosen longer term development path (sustainability indicators). For example, if a decision were taken to reduce emissions of greenhouse gases then an appropriate indicator to measure progress in this regard would be the ratio of greenhouse gases to Gross Domestic Product. (DEAT, 2006c: 112) Within the jurisdiction of the Department of Trade and Industry (DTI), there are likely to be several industries that promote various activities that might influence greenhouse gas emissions. The DTI might be achieving particular success as a department in kick-starting such industries through subsidies or trade agreements. They might even be praised for their performance in this regard.

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See Norton's diagrams in Appendix 2a and 2b.

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However, when linked to the government's overall commitment to reducing greenhouse gas emissions, these industries may no longer be seen in a

favourable light.

The monitoring of departmental performances with regards to higher focal level sustainability indicators could be achieved by the aforementioned proposed Department of Sustainable Development. This department could provide the proposed Standing Committee on Sustainable Development with hands on information about the performance of various departments and ministers within those departments in achieving the higher focal level values. The collection of the data for the performance of individual departments would be the responsibility of the individual department with the proposed Department for Sustainable Development being responsible for researching and analysing the relationship between the various lower focal level departmental performance indicators and the higher level sustainability indicators. This invaluable information could be made available to the Environmental Commission and the public when the proposed Standing Committee on Sustainable Development makes their submission to Parliament regarding the Medium Term Budget Statement in November.

All departmental activities within government should be measured in terms of sustainability indicators so as to move away from it being "nice-to-have" additional information when measuring government performance. I suggest that at the end of a government of the day's 5-year term of office, sustainability indicators could be assessed and the political regime given a rating before the general election, to show how sustainably they had developed the economy. Every ten years, a full Sustainability Report could be compiled to show how well government had managed the country's resources and generational bequests.

The creation of a proposed Environmental Cabinet-level Cluster would create an opportunity for departments whose functions affect the environment to address Cabinet. It is also an opportunity for high-ranking ruling party officials to discuss with their heads of departments possible changes to the chosen development path and affected line functions in the light of available performance targets and sustainability indicators.

Another proposal discussed in the previous section was extending the legislative phase of the budgetary process from just a week to a couple of months: beginning in November when the Medium Term Budget Policy Statement is presented and continuing through to February when the budget is officially tabled in Parliament. It could be handled in hearings by the proposed Standing Committee for Sustainable Development. The viewpoints of the Standing Committee for Sustainable Development would have been influenced by consultations with a proposed Cabinet Level Environmental Cluster.

In concluding this section on multi-scalar analysis in adaptive management, it is important to make clear a possible misunderstanding. The use of the multi-scalar analysis in a process like the budget could be perceived as trying to dictate to political parties how to manage the revenue during their term of office. However, this is not the intention of adaptive management's principle of multi-scalar analysis. Multi-scalar analysis, though it refers to higher and lower focal levels, need not imply that the higher focal level values are not open to discussion.

Multi-scalar analysis should be understood in conjunction with the first principle of Norton's ethic, that of experimentalism. Within the principle of experimentalism, all indicators and, indeed all the values they represent, are open to discussion and revision. The visioning process that brings about the identification of indicators is therefore a continual process that must be constantly revisited and adjustments made to indicators to better represent changing values. The ruling political party still has the power to determine revenue spending through sheer representation in the MinComBud, the Budget Council, Budget Forum and the proposed Cabinet Level Environmental Cluster. Through these committees, they would be able to have a direct say as to how these different indicators are prioritised. It is this prioritisation that creates the development path.

What is different about this system, however, is that they would

have to justify the choices they make with chosen indicators. The desirable future, and the indicators that are used to steer the economy towards that envisaged future, would be available for the

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interested public, the proposed Environmental Commission and other environmental watchdogs to discuss during the legislative phase of the budget. Any change in the environment would be observed by the data that is gained through the indicators. If, for example, an increase in the use of wind energy resources leads to a loss of migratory birds in the Western Cape then the community of Cape Town might decide that the use of wind energy ought to be restricted in a particular area and they may choose solar power instead, or revert back to the burning of fossil fuels. The interplay between lower and higher focal levels is vital within adaptive management's understanding of truth as being context bound. Truth, in Norton's understanding of adaptive management, is a dynamic process that changes as the context changes. (Norton, 2005: 93, 94)

Due to the time-consuming logistics involved in promulgating a budget, it is highly unlikely that the current budget process would be able to accommodate a detailed discussion about South Africa's development path or what kind of sustainability indicators best represent this, so this exercise is best left to the local environmental municipal advisory committees, the proposed Standing Committee on Sustainable Development and the proposed Department of Sustainable Development. However, the proposed additional environmental budgetary committees like the Environmental MinMecs, the proposed Environmental 4x4, and the proposed Environmental Cabinet Cluster, the proposed Environmental Directors-General Cluster could use any revised sustainability indicators to influence their decisions in the budget process.

3. Localism and constructing a new budget process

What kind of impact would adopting localism as a principle within the budget process have on the structures that operate currently? Previously, I

suggested a switch towards the empowerment of local authorities to be involved in as much of their own budgetary decision-making and revenue collection as possible, and where this is not possible, there should be improved information feedback mechanisms between local, provincial and national government.

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Currently the intergovernmental fiscal system essentially allows for revenue generation in two places: national and local government, and revenue expenditure in three places: national, provincial and local. (South Africa. Department of Provincial and Local Government, 2002: 5) The national government collects the revenue and allocates unconditional and conditional grants to provinces. Local government collects most of its revenue while also accepting some funds from the national government. As discussed previously, key to ensuring appropriate expenditure on local issues, is the direct involvement of local authorities in the identification and alleviation of problems. In keeping with this assumption, the idea would be, where possible, for each national and provincial government department to assess which of their current functions would best be performed by local government and to go about devolving these revenue collection and expenditure implementation responsibilities.

Currently, national and provincial governments take responsibility for school education, health, welfare and housing. Province is exclusively responsible for provincial roads and traffic, abattoirs, provincial planning and provincial sport. Local government functions involve services like electricity, water and sanitation, municipal and household infrastructure, streets, street lights and refuse collection. (South Africa. Department of Provincial and Local Government, 2002: 1, 2) The environment is the responsibility of all three levels of government.

The ideal situation would be for each local municipality to be responsible for all the above-mentioned functions with national and provincial government only performing

policy guidance, support services and additional funding or expertise when needed. Logistically, this is unrealistic. It is not the undertaking of this thesis to go into all the technical detail concerning which responsibilities are currently suited to which sphere of government. There are very good reasons, among them insufficient capacity at local government level, to keep essential services like education at a provincial level. Geography poses a further limitation with some services like water management that occur over a wide area being impossible to manage effectively at a local level alone.

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The kind of limitations mentioned above suggest that, in cases where the local management of a line function is not advisable or where shared management is advisable, the key to implementing localism in the current budget process is ensuring that there is effective transfer of information about the local peculiarities of places to those making revenue decisions that affect these places. This information is best transferred through the intergovernmental fiscal system. There are numerous intergovernmental forums within the intergovernmental fiscal system that are designed to facilitate co-operation and consultation between the different spheres of government. (South Africa. Department of Provincial and Local Government, 2002: 5)

However, in order to satisfy localism's requirement that local values and biophysical particularities be considered in budgetary allocation, national and provincial government would need accurate and timeous information on the particular nature of local issues. It is for this reason that the generation of local sustainability indicators and local performance indicators for each department and line function within local government is suggested. The generation of these indicators would go a long way to encoding the values of local communities and making known the environmental, social and economic stresses facing them. The proposed local environmental municipal advisory committees that were discussed under the previous heading of experimentalism are the bodies that would be responsible for monitoring these sustainability indicators in

communities and ensuring that were upheld in local municipalities. Moreover, they could suggest revising them if they no longer reflected local values or they could suggest the generation of new sustainability indicators if needed.

To illustrate the point, take the example of Green Space per Capita, an indicator that The City of Cape Town Sustainability Report of 2005 uses. (City of Cape Town, 2005: 13)

This indicator measures the extent of green space within Cape Town per person. Green spaces are defined as formally protected provincial and local areas and provincial and municipal parks and gardens, excluding Table Mountain National Park. This indicator reveals a local value that of green spaces.

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If the indicator was arrived at in a legitimate public participation process, its existence shows that local people in Cape Town value green space and are worried about it being diminished or threatened. The creation of the indicator has made this local value tangible and measurable.

The idea is to encourage all local authorities to develop local sustainability reports to indicate what their local values are and to identify their environmental, social and economic stresses. This information should be arrived at in legitimate public participation processes where indicators that represent local values and desirable biophysical conditions are chosen. These proposed indicators could then be made available for discussion purposes in intergovernmental forums in the intergovernmental fiscal process. Another suggestion is that these proposed local sustainability reports and their data form the basis of proposed national and provincial sustainability reports.

The financing and facilitating of these local, provincial and national sustainability reports could become the responsibility of the proposed Department of Sustainable Development. The function of this Department of Sustainable Development would be to ensure that all national departments had access to local sustainability report data in their

areas of concern. This would mean, for example, that information on local sensitivities regarding air pollution, biodiversity and unemployment would be available to the Department of Trade and Industry when deciding on what kind of industrial development to promote in a specific part of the country. They would have access to air pollution concerns, the availability of water and unemployment levels. No longer would decisions at a national level need to be made in ignorance of local social, economic and environmental conditions. 34

The ability of national and provincial government to effectively monitor the compliance and performance of local government would rely on the accuracy of the information that they received from local government. Local government departments could be required to
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See Appendix 3b for clarity on how the sustainability reports could influence decision-making.

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produce quarterly performance reports to national and provincial government on how effectively their programmes were performing. The national Department of Sustainable Development could monitor how these performance indicators related to sustainability indicators which would include not only environmental indicators but economic, social and institutional ones. This would enable the proposed Department of Sustainable Development to ascertain how much a local authority was contributing to the sustainable development of a particular region. Areas that were managing their resources effectively, could be delegated more responsibility and allowed to begin issuing more taxes.

An example could be if the City of Cape Town decided to offer tax breaks to companies wanting to invest in shoe manufacturing within the city limits. One of the performance indicators for the Department of Economic and Human Development in the City of Cape Town could be number of jobs created by such industries in their municipal boundaries. If their performance indicator had been 300 jobs annually, the

development of a shoe factory that provided jobs for 150 people would significantly improve their performance. However, if the shoe factory's manufacturing processes caused air pollution that significantly increased the city's contribution to carbon dioxide per capita, a national sustainability indicator, the project would be seriously questioned and the City of Cape Town left to consider alternative manufacturing industries that upheld the sustainability targets for a particular that area.

The idea is to have performance indicators and sustainability indicators at each level of government that are facilitated and monitored by the proposed Department of Sustainable Development. The proposed Standing Committee on Sustainable Development could call municipal departments and national government departments to account for any transgressions. They could report to the National Assembly on national, provincial and local government's progress in attaining these performance and sustainability indicators at various levels of government.

The proposed Department of Sustainable Development would also be responsible for aggregating this information and making it available for intergovernmental discussion

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forums like the meetings of the Financial and Fiscal Commission, the Budget Council, the Ministers and Members of Provincial Councils (MinMecs), the Budget Forum, the MinComBud, the joint MinMecs, the 4x4s, Cabinet Clusters, Directors-General Clusters and the Treasury Committee. The proposed Environmental Cabinet Cluster, the proposed Environmental MinMec and the proposed Environmental 4x4 would also find it useful. Other bodies outside that have influence on the national budgetary process that might find this information useful would be the South African Local Government Association (SALGA), the Forum for South African Directors-General (FOSAD), the National Council of Provinces and the President's Coordinating Council.

There are several

opportunities, as discussed previously under the heading of experimentalism, within the drafting of the budget process when this information would come in useful.

The ideal would be for revenue to be largely spent in local government with national and provincial government becoming significantly scaled down. Where this is not possible, national government could retain control, as long as the national government had access to timely and accurate local information as suggested in the sustainability reports. On the revenue collection side, with municipalities located within certain biophysical environments, specific taxes could be implemented that relate directly to the particular environmental issues in a local area. One example of this might be taxes on motor vehicles during peak hours in particularly congested urban areas. This could be introduced within town and city limits so that traffic congestion and pollution limits are limited.

E. How far is the South African National Budget process from adopting the insights of adaptive management?

The South African National Budget process itself might not yet have recognized the need for an adaptive management approach to economic decision-making about the environment, but elements of the above-mentioned adaptive management process are being discussed and emerging within DEAT. One of the key insights that adaptive management's guideline of experimentalism as an approach to environmental decision¹⁴³

making suggests is the need for more information within the budget process. In this chapter, I suggested the use of sustainability indicators that have been arrived at in a community driven multi-stakeholder process overseen by a local environmental municipal advisory committee.

DEAT acknowledges that up-to-date information is not always available and that there is inadequate environmental monitoring. However, it states that steps have already been taken to address these shortcomings. The DEAT website states:

“Serious gaps in environmental data greatly hamper our efforts to make better policy decisions. The current (2006) South Africa Environment Outlook report had to rely on inventory data for greenhouse gases that are more than 10 years out of date. Critical indicators for which we have no adequate data include current land cover, fine-scale spatial information on habitat degradation, and some aspects of water quality, air quality, and carbon emissions. We also do not have reliable data on genetically modified organisms, human vulnerability, or groundwater use and recharge, and we have limited knowledge of some aspects of biodiversity. There is, furthermore, a need for a consolidated and consistent monitoring and evaluation system. Currently, many data-generation exercises, such as the population Census and national land cover assessments, do not coincide with reporting programmes including the state of environment reports. Monitoring is often not carried out at regular intervals, and in some cases is so sparse that meaningful interpretation over large spatial scales cannot be made.”

(South Africa. DEAT, 2007)

Moreover, the DEAT website records that a set of environmental indicators had been published in 2002 for use in state of the environment reporting. These, along with indicators set out in the Millennium Development Goals and the 2004 Johannesburg Plan of Implementation, had been reported on in the South Africa Environment Outlook: A report on the state of the environment. (DEAT, 2007)

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However, it is true that that the sustainability indicators conceived of by DEAT are not seen as part of a community driven process designed to ensure that local, multi-scalar environmental concerns are taken into account in the budgetary decision-making process an ongoing basis. Moreover, nor are these sustainability indicators seen as part of an experimental process aimed at reducing uncertainty within the budgetary process.

While writing this chapter, I used some of the insights suggested by

DEAT in a study in 2006 entitled People–Planet–Prosperity: A Strategic Framework for Sustainable Development in South Africa and applied them within a budgetary context. The study discussed not only sustainability indicators (South Africa. DEAT, 2006c: 111) but also identified the need for a “high level institutional arrangement to enforce sustainable development”. (South Africa. DEAT, 2006c: 105) It said there was a need for appropriate indicators to measure progress towards sustainability and to integrate these into a Government–Wide Monitoring and Evaluation System (GWMES). (South Africa. DEAT, 2006c: 60, 105)

At a departmental level, it suggested the creation of a sustainable resource or an Environmental Cluster equivalent to the other Clusters at Cabinet level. Moreover, it called for further governance measures to embed sustainability on the President’s Coordinating Committee, the Financial and Fiscal Commission and the Forum for South African Directors General (FOSAD). The document also suggests a multi–stakeholder Commission for Sustainable Development that is tasked with improving strategic planning, monitoring and implementation processes. (South Africa. DEAT, 2006c: 105)

I instead suggested an Environmental Commission, much like the Human Rights Commission, and a Standing Committee for Sustainable Development. The reason for my call for an Environmental Commission rather than a Sustainable Development Commission is because I think there is a need to allow intrinsic environmental values a prescribed space in the budgetary process otherwise they will be drowned out by other use values.

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An Environmental Commission that is made up of environmental stakeholders is the most likely place for that to emerge. In a Sustainable Development Commission environmental use values are more likely to be prevalent.

DEAT's document further makes mention

of the creation of a possible Cabinet Level Environmental Cluster. (South Africa. DEAT, 2006c: 105). I took up this suggestion of the document earlier in this chapter. I believe it would make sense in terms of sustainable development for all the ministers of the various departments to be represented on such a forum and the discussion to be focused on how sustainability indicators in each department relate to indicators in other departments and how they cumulatively impact on sustainability.

The suggestions regarding the Environmental Commission and the Cabinet Level Environmental Cluster or the need for a "high level institutional arrangement to enforce sustainable development" are not taken up again in a later version of People-PlanetProsperity: A Strategic Framework for Sustainable Development in South Africa published in 2008. This document was revised with significant changes, and accepted in 2008 by the South African Cabinet. (Beaumont, 2008) I have included a few of the key points that were reported on in the new document that related to adaptive management. Progress had been achieved in the following areas (South Africa. DEAT, 2008: 28)

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Guidelines had been developed by DEAT for including environmental considerations into Integrated Development Plans;

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DEAT and the National Treasury were discussing ways of incorporating sustainable development into the national budget.

The document also recognised the following gaps: (South Africa. DEAT, 2008: 30, 31)

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Government's monitoring, evaluation and reporting system did not measure performance in respect of sustainable development targets effectively;

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There was insufficient collecting and collating of reliable and accurate information at different institutional levels.

By calling for an Environmental Commission I am not seeking to privilege the intrinsic value of nature, only to create a space for issues of biodiversity, conservation and ecosystem limits to be heard within the parliamentary budgeting system.

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Finally, the document (South Africa. DEAT, 2008: 50, 51) recognised the need for the monitoring of sustainable development and thus called for:

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The development of a set of indicators to measure sustainable development;

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The strengthening of the Government Wide Monitoring and Evaluation System by incorporating sustainability indicators;

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A coherent monitoring and review system;

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An improvement in government's capacity to gather and assess statistics.

There is a significant overlap between the progress, gaps and needs mentioned in the revised 2008 version of People–Planet–Prosperity: A Strategic Framework for Sustainable Development in South Africa, and the national budgetary changes suggested by adaptive management in this chapter. This chapter, for example, calls for:

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Sustainability indicators to be generated at a local level and collated nationally;

•

It suggests that these sustainability indicators be included along with the performance indicators in the Government Wide Monitoring and Evaluation System;

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It demonstrates how a process of evaluation within departments would work by comparing performance indicators and sustainability indicators;

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It sets up a sustainable development monitoring process through the proposed Department of Sustainable Development and a proposed Standing Committee on Sustainable Development.

I, therefore, conclude that there is significant evidence to suggest that the insights of adaptive management would have a useful role to play in guiding the implementation of sustainable development in the budgetary process in South Africa. However, a number of significant changes in the structure of the national budget process will first have to take place before this will become a reality.

In my discussion on multi-scalar analysis, I looked at how one could link the 0–5 year time scale in which the budget currently operated to sustainability indicators that operated

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on the 5 to 200 year time scale. The South African government has already initiated a programme called the Government Wide Monitoring and Evaluation System. (The Presidency, 2005) that requires that departments measure the performance of each of their individual programmes through a performance indicator. The fact that this is already a reality and that sustainability indicators are in the process of being formulated means the multi-scalar approach, as suggested previously, is a possibility.

DEAT's 2006 discussion document lists four categories of sustainability indicators: social sustainability indicators that include statistics like change in percentage of population living below the poverty line; environmental sustainability indicators like change in waste recycling and re-use; institutional sustainability indicators like change in number of corruption cases; and economic sustainability indicators

like change in real per capita growth. (South Africa. DEAT, 2006c: 111-113)

In terms of the guideline of localism, sustainability reports are increasingly being done both at local and national level. DEAT's website states: "Several reports on the state of rivers systems and an interim report on the state of our coast have been published, and a national inventory of wetlands is being compiled. South Africa contributed to the Millennium Ecosystem Assessment and recently conducted the National Spatial Biodiversity Assessment. Several provinces and municipalities have produced state of environment reports." (South Africa. DEAT, 2007)

In conclusion of this section, it is my impression that there is general acceptance within government circles that in order for adequate environmental decision-making to take place within government, adequate information in the form of indicators is needed. There is also openness to the need for additional structures to protect the environment. The suggestions for a Multi-stakeholder Commission for Sustainable Development and a Cabinet Level Environmental Cluster have already been aired in the public domain, although they have not been accepted. Elements of an adaptive management process within environmental decision-making are unconsciously emerging. What is thoroughly

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lacking, however, is an adequate framework or philosophical understanding of how the various parts of the puzzle fit together within economic decision-making and within the South African budgetary process in particular. Hopefully this thesis provides some clarity on the possibilities regarding this.

F. Conclusion

In conclusion of this chapter, my interpretation of Norton's environmental ethic for the budget process is a plea for increased resource information to be included in the process so that the choices that are made within the economy are made mindful of the long term environmental and social consequences. This is necessary so that the

government of the day's different development paths can be corrected by experience rather than based on bureaucratic procedures or political whims. In order to achieve this, I suggested Norton's use of indicators as tangible measurements of environmental, social and institutional goods. I stated that indicators should be included in the meetings of most of the actors in the budget process so that all decisions about revenue can be checked against measurable objectives that have been selected in order that the chosen development path be realised.

In this section on multi-scalar analysis, I interpreted Norton's ethic to be proposing that within the current budget process, a second focal level be added so as to ensure that the short term impacts of revenue expenditure, that are currently measured according to short term performance indicators, can now be measured on a longer term focal level. This can be made possible by linking the current departmental performance indicators to longer sustainability indicators. In addition, a Department of Sustainable Development and a Standing Committee on Sustainable Development is suggested to monitor these at all levels of government.

I emphasised that the use of the multi-scalar analysis in a process like the budget is not an attempt to dictate to political parties how to manage the revenue during their term of office, but rather a check for themselves, that they are keeping on their chosen development path. In terms of localism, I stated that Norton's ethic would support a long149

term devolution of revenue generation and expenditure to local government. However, I stated that realistically, it was unlikely that all functions could be devolved. In cases where this was not possible, there was a need to have effective information systems between national, provincial and local government within the intergovernmental fiscal framework. I also suggested that this could be achieved through the commissioning of local, provincial and national sustainability reports that were managed by the proposed Department of Sustainable Development and Standing Committee on Sustainable

Development.

In chapter four, I once again use Norton's three guidelines of experimentalism, multiscalar analysis and localism as critical and constructive tools of analysis on three budgetary votes in the SA National Budget in 2005. These include: the Department of Environmental Affairs and Tourism, Department of Trade and Industry and the Department of Agriculture.

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CHAPTER FOUR: DEMONSTRATING THE INSIGHTS OF ENVIRONMENTAL PRAGMATISM ON THE SOUTH AFRICAN NATIONAL BUDGET VOTES OF 2005

A. Introduction

In the previous chapter, I analysed the national budget process from the perspective of environmental pragmatism. I used Norton's adaptive management guidelines, i.e. experimentalism, multi-scalar analysis and localism to achieve this. I suggested ways in which the process could be adjusted to better reflect the insights that these perspectives bring to light. In this chapter, I continue this analysis by critically looking at three South African national departmental votes within the South African National Budget of 2005 using the adaptive management guidelines of Norton. The departments to be analysed are: the Department of Environmental Affairs and Tourism (DEAT), the Department of Trade and Industry (DTI) and the Department of Agriculture (DOA). 36

I begin by describing the methodology I use to interpret Norton's guidelines for adaptive management within the departmental votes. I then describe the local context in which I will be interpreting the national budgetary votes. I have chosen Cape Town, a city in the Western Province of South Africa. My description of Cape Town is based on The City of Cape Town Sustainability Report of 2005 which has a list of complete indicators included. I selected the indicators that are relevant to the departments under discussion in the thesis.

Two points are important to remember in my discussion of indicators. Firstly, that this is

not a scientific thesis, so my focus is not on developing indicators or testing their

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See Appendices 4, 5, 6 for graphic representations of budget expenditure for DEAT, DTI and DOA respectively. Appendix 7 shows the expenditure allocation of the all votes in Budget 2005.

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viability. I use the indicators merely as markers of a longer-term, local and experimental perspective.

The selection of appropriate indicators is a political as well as a technical process that is worth a thesis on its own. Secondly, both local and national indicators represent a multiscalar perspective. They differ only in the data they represent. The ideal, as suggested in the previous chapter, is if all locally developed indicators had national sustainability indicators that represented the accumulated national data on that particular issue.

Following my description of the City of Cape Town's Sustainability Report of 2005, I move to a discussion of the DEAT, DTI and DOA budget votes respectively. I analyse these votes with the help of selected indicators. I first use these indicators as critical tools to identify gaps or contradictions in the 2005 votes. I then, in the following section, use these same indicators to point out what constructive suggestions could be made about the individual votes under discussion.

B. Developing a methodology for interpreting adaptive management within the departmental votes

Three steps will be taken in developing a methodology for interpreting the value of adaptive management in assessing, and possibly even transforming the departmental votes of DEAT, DTI and DOA and the current spending priorities that characterise them.

The first step will be to spell out the implications that the three components of adaptive management will have for a critical assessment at this level of analysis. The second step will entail some reflection on the role of local indicators at this level of analysis, bearing

in mind that the sustainability indicators that we currently have available on local and national levels have not been generated by processes envisaged by the adaptive management perspective. A third step will entail a brief statement about the procedures that will be followed in the next section to actually execute the analysis and the assessment.

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1. Step 1

Experimentalism is a central concept in adaptive management. It is a commitment to use experience to reduce uncertainty with regard to the management of environmental resources and also the formation of values. (Norton, 2005: 93) In terms of the national budgetary votes, experimentalism would mean subjecting expenditure decisions to the test of experience, rather than merely relying on political authority to determine financial priorities. This would mean that the political prioritization processes that lead to the handing down of resource envelopes to departments would also need to be informed by departmental experimentation processes with expenditure. There would need to be some kind of reporting on what the effects of past expenditure were, especially at a local level.

I have proposed that this be achieved with the use of indicators in the departmental budgetary votes and in the national budgetary process. These indicators that were generated at a local level would provide immediate, updated information that pertained to the particular government programme under discussion. The generation of these localised indicators could be undertaken by local authorities working in conjunction with the proposed national Department of Sustainable Development. They could be generated by local environmental advisory committees working within local authorities and producing local sustainability reports.

In terms of localism, this would involve a national indicator process that was driven by local sustainability indicators. This national indicator process that would be managed by

the proposed national Department of Sustainable Development could represent an aggregation of all the relevant indicators. One could, for example, work out the emissions of greenhouse gases as a ratio of GDP (South Africa. DEAT, 2006c: 112) for Cape Town and other metropolises. The contribution of these individual cities, along with activities in rural areas, would form the basis of the national indicator. When expenditure was identified to address a particular sustainability concern, it would have to be specific about

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what local areas were likely to be most affected. Local and national indicators could then record the impact of these various policies or interventions. Localism would also require that indicators form part of a consultative process. Indicators generated by scientists that have not been through a community or political validation process have no credibility or reason to be prioritised. This is because the choice of indicators that a nation or local authority chooses depicts an underlying sense of values. The concept of experimentalism would require that those values, like factual states of affairs, were subject to the criteria of experience. In other words, they too would need to be tested to see if they still adequately depicted the local or national public's priorities. If the indicators no longer represented the nation's or local authority's interests or values, then new indicators would need to be sought, to match the emerging values. I propose that indicators be obtained through a combination of public participation processes and consultations with scientists and other experts.

Norton (2003: 535, 536) writing with Steinemann suggests a system of evaluating development paths that "encourages the articulation of multiple values and goals, coupled with a process of ongoing discussion, debate, information-gathering, and revision of goals ... " They suggest that citizens and stakeholders be involved in this "ongoing iterative process" to build "trust" and an "expanding database". The outcomes they hope to generate through these processes are measurable indicators. They describe a process whereby an ongoing advisory committee chooses indicators to guide policy and then

reflects on these choices based on the action outcomes. Localism thus requires some process and structures through which local authorities can generate, monitor and revise sustainability indicators. For the purposes of this analysis, the question is then whether such processes, structures and locally generated indicators inform the budget votes of DEAT, DTI and DOA.

Multi-scalar analysis, the third guideline of adaptive management, draws attention to the fact that environmental concerns are played out over multiple scales of time and place. (Norton, 2005: 93). Norton refers to three distinct time periods: the 0 to 5 year time period, the 5 to 200 year time period and the 200 year to indefinite time period. (Norton 154

2003: 68) However, the departmental votes do not reflect this reality and only focus on the 0-5 year time scale discussed by Norton (2003: 68). This 0-5 year time scale is measured by national government departments with performance targets in annual reports. Similarly, the integrated development plans of municipalities also incorporate performance indicators. While these performance targets are able to measure whether departments or municipalities achieve their goals, due to their short term focus, they are not able to inform us about the long-term sustainability of departmental programmes or development plans. What is needed is a second tier evaluation system that represents Norton's 5 to 200 year time period, and that is able to demonstrate the impact of projects and programmes over the longer term. In this chapter, I demonstrate how higher level sustainability indicators like those found in The City of Cape Town's Sustainability Report of 2005 could form the framework for the integrated development plans and budgets of municipalities, as well as the building blocks of national departmental frameworks.

2. Step 2

In the absence of a complete set of national indicators derived from local indicators, as would be ideal, I have simply made use of the indicators that have

been derived from The City of Cape Town's Sustainability Report of 2005 to depict local values. Many of these local indicators could be used as national indicators if they could be aggregated with sustainability reports from other cities and rural areas. My aim was to develop a process that would best reflect a local, multi-scalar and experimental approach to the national budgeting process. In the sections that follow, I will attempt to do this within each departmental budget, starting with the DEAT, followed by DTI and ending with the DOA.

The City of Cape Town's Sustainability Report of 2005 has 32 indicators. These indicators were developed through scientific research and in consultation with key stakeholders. (City of Cape Town 2005: 5) This is not the on-going public participative process envisaged by Norton as expressed in an article with Steinemann (Norton and 155

Steinemann 2003: 535, 536) that discusses the development of community values. If adaptive management were to be fully implemented in budgetary processes this would mean that one would have to establish ongoing elected sustainable development advisory committees at local authority level that were involved with the compiling of the local authority indicators and sustainability reports. However, for the purposes of this thesis, I will use The City of Cape Town's Sustainability Report of 2005, as this ideal report does not exist in reality yet. The presence of indicators, at the very least, suggests that some form of dialogue has occurred with stakeholders.

The City of Cape Town's Sustainability Report of 2005 follows five state of the environment reports that were issued by the City and marks a shift from reporting on the natural, built and socio-economic environment towards "assessing relationships between the biophysical environment, the economy and society". (City of Cape Town, 2005: 4, 45) The indicators are divided into eight categories: air and energy; biodiversity; water; waste; health and safety; infrastructure; education and economy; and good governance.

(City of Cape Town 2005: 3) I select eight indicators out of the five categories: air and energy; biodiversity; water; waste; and education and economy. When analysing DEAT's budget, I use the following indicators as points of reference: waste disposal per capita; landfill lifespan and green space per capita. When analysing DTI's budget, I select the following: the percentage of economically active population that is employed; gross geographic product or the total value of goods and services by sector per annum; and inequality measured by income disparity in households. When analysing DOA's budget, I refer to the unemployment rate and the income disparity statistic.

In the conclusion of The City of Cape Town's Sustainability Report of 2005, the document states that, when the current report was compared with the previous five state of the environment reports, a number of significant changes were recorded. (City of Cape Town, 2005: 45) These included that:

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Murder, rape, commercial and industrial crime rates were down for 2004 which showed more effective policing and law enforcement;

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Coastal water quality had improved;
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Gross geographic product had increased;

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Local Agenda 21 projects and education and awareness programmes had increased;

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Water use had decreased since water restrictions were created in 2001.

The City of Cape Town's Sustainability Report of 2005 also recorded, however, several issues that were a cause for concern (City of Cape Town, 2005: 45):

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Particulate matter pollution had not improved and stayed at the same level since 2001;

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The housing backlog had increased since 2000 with more people moving to Cape Town;

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Informal settlement fires had increased since 2001;

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Unemployment had risen by 10% since 1997;

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Waste per capita had increased by 43% since 1999. In 2004, one person on average produced 145kg more waste than they had in 1999;

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HIV/AIDS and TB had both been steadily increasing.

In the introduction to The City of Cape Town's Sustainability Report of 2005, the City manager said that Cape Town was moving away from its vision of a sustainable city. He said "high levels of population growth, increasing unemployment, associated poverty and high levels of waste generation" were some of the main problems. (City of Cape Town, 2005: 5) In the conclusion of the report, however, the Report stated that the City hoped to improve on these problems through, among other means, The City of Cape Town's Integrated Development Plan of 2004/5 which put forward an action plan for achieving sustainable development. (City of Cape Town, 2005: 45)

The City of Cape Town's Integrated Development Plan of 2004/5, an extract of which was included as an annexure to The City of Cape Town's Sustainability Report of 2005, had 15 goals they set for the year 2020. (City of Cape Town, 2005: 47) Among them were:

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100% improvement in key human development indicators;

- Less than 5% of population in informal settlements;
- Levels of violent crime reduced by 90%;
- Water use and waste production down 30%;
- Access to safe green space within walking distance for all;
- Renewable energy share equal to 10% of energy consumed;
- Double average real per capita income while reducing inequality;
- Unemployment less than 8%;
- Less than 5% of the population illiterate.

In the individual budget analysis that follows, I will make use of the sustainability indicators of The City of Cape Town's Sustainability Report of 2005 and selected 2020 goals of the above-mentioned City of Cape Town's Integrated Development Plan of 2004/5 that were included in the annexure of The City of Cape Town Sustainability Report 2005. I will use them to assess and comment on the budgetary considerations of DEAT, DTI and DOA. It would have been ideal to have a national sustainability report that had been compiled with the help of all the local sustainability reports and the local municipal integrated development plans. This would enable national government to be able to prioritise these indicators and their budgetary considerations within a national budget. However, there is no annual national sustainability report

that has been compiled by collating local sustainability reports, or a list of nationally aggregated sustainability indicators. Therefore, where possible, to gauge how the issue under discussion has been prioritised I shall consult the most relevant source of information, the National State of the Environment Report for 2006 entitled: South Africa Environment Outlook. A Report on the State of the Environment. While this report has come out a year later than the national budgets under discussion, there is considerable overlap in the data used.

Before I proceed with my analysis of the individual budgets in the following section, it is important to point out that my suggestions there, regarding how DEAT's expenditure could be adjusted to better cope with the realities presented by the sustainability indicators of The City of Cape Town's Sustainability Report of 2005 and goals presented by The City of Cape Town Integrated Development Plan of 2004/5, are presented on the

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basis that they are one interpretation, amidst many possible alternative expenditure choices that could be made with these documents as a reference. In the following section, I am developing a process that could take place both within the individual national departments and between the political heads of national departments and the MinComBud, the Budget Forum, the Budget Council and the joint MinMecs. Divergent interpretations could proceed from the same data and goal set. Adaptive management accepts this reality and is not prescriptive about what choices people should make.

3. Step 3

In my analysis of the individual budgets, I will firstly be comparing the Estimates of National Expenditure with what is reported to have been done in the Annual Reports of the departments under discussion. This process does not sufficiently show us whether the departments are fulfilling their mandates over the longer term. I then demonstrate the critical ability of an adaptive management approach to show up inconsistencies and gaps

by assessing the departmental votes in terms of the sustainability indicators of The City of Cape Town's Sustainability Report of 2005 and selected goals of the 2020 goals of The City of Cape Town's Integrated Development Plan of 2004/5. Lastly, I will demonstrate the constructive power of an adaptive management approach by identifying alternative processes and structures that can overcome the problems identified in the critical phase of analysis.

The above-mentioned process encapsulates the three guidelines of adaptive management. It is local in the sense that I will be making use of locally generated sustainability indicators and integrated development goals. It is multi-scalar in the sense that these indicators will be used to assess the programme expenditure in terms of whether the specific aims set by the programme expenditure serve longer term sustainability goals. It is experimental in that this process of analysis is aimed at revising the Estimates of National Expenditure based on local knowledge.

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C. An analysis of the national budgets from the perspective of adaptive management

1. The Department of Environmental Affairs and Tourism (DEAT) 1. 1 Comparing DEAT's Estimated National Expenditure with its Annual Report 37

In this section, I compare DEAT's Estimated National Expenditure with its Annual Report to determine what kind of information is currently available in the budget. It is my hypothesis that this process, though efficient at measuring whether targets have been met, says very little about whether DEAT is achieving its mandate of protecting the environment in South Africa.

DEAT, in keeping with the government's commitment to social upliftment, allocated the largest portion of its R1 723 million budget to Social Responsibility and Projects. This is estimated to amount to more than R414 million. (South Africa. National Treasury, 2005b:

653) The Annual Report for 2005/6 records that more than R390 million was spent.

(South Africa. DEAT, 2006d: 56) They created 1 839 310 temporary job days in the

expanded Public Works Programme and 301 permanent jobs. The overall target set to be achieved was 4 542 500 temporary jobs by March 2009 and 1 350 permanent jobs by March 2009. (South Africa. DEAT, 2006d: 29)

The Tourism Programme, the second biggest priority in Budget 2005, was allocated more than R403 million of DEAT's R1 723 million budget. (South Africa. National Treasury, 2005b: 653, 662) The Tourism Programme has three sub-programmes: Tourism Support, Tourism Development and the Financial Contribution Sub-programme. The Tourism Support Sub-programme is aimed at supporting small and medium sized enterprise development and facilitating investment in tourism.

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See Appendix 4 for a graphic representation of DEAT's estimated programme expenditure for 2005.

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The Tourism Development Sub-programme tracks and monitors tourism performance and provides tourism information to government and industry to inform decision-making. The financial contribution of the sub-programme provides for government's contribution to South African Tourism's (SATOUR) operational budget and international tourism marketing.

Tourism spent more than R384 million. (South Africa. DEAT, 2006d: 54) Tourism's targets for 2005 included a 60% decrease in complaints, 30% implementation of the Black Economic Empowerment scorecard and 400 more transactions achieved by the Tourism Enterprise Programme. (South Africa. National Treasury, 2005b: 664) Tourism Support achieved a 75% reduction in consumer complaints. (South Africa. DEAT 2006d: 25, 26) It is unclear if there was any implementation of the Black Economic Empowerment scorecard, however, the Charter Council for Tourism Black Economic Empowerment was appointed, the budget finalised, the website completed, the tourism self-assessment tool completed and the charter helpline was put in place. A total of 495

transactions were achieved in 2005/6 in the Tourism Enterprise Programme that promotes and facilitates transactions between Small Medium and Micro Enterprises and big business in the tourism industry. This enabled the creation of 6 577 tourism jobs in 2005. There was a direct increase in employment in the tourism sector of 539 017 in 2005.

Third on the list of priorities in terms of spending were the Biodiversity and Conservation Programme on which DEAT allocated R287.9 million to promote and conserve South Africa's biological diversity and cultural heritage. (South Africa. National Treasury, 2005b: 653, 665) It allocated R29.7 million on transfrontier conservation and protected areas, R19.45 million on biodiversity and heritage and R237.16 million on financial contributions to the South African National Parks, the Greater St Lucia Wetland Authority and the South African National Biodiversity Institute.

The national spatial biodiversity assessment was commissioned in 2005. The norms and standards for biodiversity management were being developed. Six community forums had been established for the development of Tshanini, Usuthu Gorge and Richtersveld
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Community Conservation Areas. The Greater St Lucia Wetland Park Area (GSLWPA) had created 300 permanent jobs since April 2005 and 113 658 temporary day jobs had also been created from April 2005. A total number of 473 permanent and 3 968 temporary jobs had been created both by SANPARKS and GSLWPA. A total of 16 separate pieces of land were under contractual appointment. The Giryondo Tourists Access facility was up and running by December 2005. By March 2006, 6 960 people had accessed the facility. A total of 79 009 hectare have been included into the transfrontier conservation areas. A total of R293.19 million was spent for the total biodiversity and conservation budget. (South Africa. DEAT, 2006d: 28, 55)

The fourth financial priority was the Marine and Coastal Management Programme with an allocation of R278.4 million. (South Africa. National Treasury,

2005b: 660, 662) In this programme, DEAT was focused on achieving maximum sustainable yield from our marine living resources so that local and international demand for our fish products could be met without overexploiting the marine resources. DEAT had also aimed to transform the ownership of the fishing industry through the allocation of fishing rights. The measurable indicators in this programme included: 1 voyage per year to Antarctica, Marion and Gough Islands; revenue collected by levies and fees through the Marine and Living Resources Act should exceed total revenue of Fund of over R150 million by December 2005; 40% of allocated fishing rights to broad-based Black Economic Empowerment groups; three new fisheries per year established and 1 officer per 5km of coastline by 2006/7.

All relief voyages to Antarctica, Marion and Gough islands were completed. The final phase of the new Marion Island base was completed. A report on the profitability of small-scale rock lobster and long line tuna fisheries was completed. There had been an improvement in the model used to calculate the effects of levy changes on the profitability of hake fishing. (South Africa. DEAT, 2006d: 23, 53) However, the aim to increase the Marine Living Resources Act's levies and fees contributions to over R150 million was not achieved. The total Marine and Coastal Management budget spent R269.57 million in 2005/6.
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The Environmental Quality and Protection Programme was the fifth priority in DEAT's budget with R196.44 million allocated in Budget 2005. (South Africa. National Treasury, 2005b: 653, 659) This programme focused largely on ensuring that regulations were adhered to and the negative impacts of development mitigated and that pollution and waste management reduced the impact of waste on safety, health and the environment. The newly established Enforcement Directorate, the passing of the National Environmental Air Quality Bill and the plastic bag campaign were some of the past successes of this programme. Targets within the Environmental

Quality and Protection

Sub-programme included a fully effective environmental impact assessment process in place by the end of 2005, and strategic environmental assessments in use by 2007, three voluntary industry waste minimisation initiatives by 2006, and the permitting of landfills with all landfills being permitted by 2007.

It was not clear in DEAT's Annual Report whether a fully effective EIA process was in place. The document stated that an electronic database had been created and co-operation with provinces and other components were strengthened and a fine structure had been imposed. A strategic assessment environmental booklet was published and distributed and a SEA guideline document drafted. Tyre regulations were drafted. A Mercury clean up project had been started with an EIA process. There had been time delays in the voluntary industry waste minimisation initiatives. An implementation plan regarding the permitting of landfills had been completed as well as an audit of the landfill backlog. (South Africa. DEAT, 2006d: 20, 21, 52) A total of R185.29 million of the Environmental Quality and Protection Programme Budget was spent in 2005/6.

The Administration Programme of DEAT was allocated more than R143 million of the 2005/6 budget. (South Africa. National Treasury, 2005b: 653, 654) It involved: policy formulation, provision of administrative, legal and office support services, the managing of personnel and finances, the managing of departmental communication, co-operative government and co-ordinating the international programme including promoting a global sustainable agenda.

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The Administration Programme created the call centre with departmental intranet and a redesigning of the website. A total of 383 employees were hired by DEAT and 166 employees promoted, nineteen employees participated in voluntary HIV testing, an institutional review was initiated and the Legal Services Directorate upgraded to a chief directorate. (South Africa. DEAT, 2006d: 18)

However, the first draft of the National Strategic Framework for Sustainable Development had not been completed as had been planned.

1. 2 Using adaptive management as a critical tool of analysis in DEAT's budget

In this section, I select some of the 2020 goals of The City of Cape Town's Integrated Development Plan of 2004/ 5 and the indicators of The City of Cape Town's Sustainability Report of 2005 that are relevant to DEAT's mandate to analyse DEAT's Budget for 2005. I select them on the basis that they relate directly to the mandate of DEAT, i.e. to protect the environment of South Africa. I use these goals and indicators as critical tools of analysis, in an attempt to assess any gaps that might exist in DEAT's 2005 budget. Formulated in concrete terms, what I would like to determine in this assessment

is

whether

DEAT's

budgetary

expenditures

specifically

address

environmental concerns in Cape Town.

The two issues within The City of Cape Town's Integrated Development Plan of 2004/5 (City of Cape Town, 2005: 45) that related directly to the activities of DEAT were:

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The need to reduce waste by 30%; and

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The need to provide access to safe green space.

In The Cape Town's Sustainability Report of 2005 these items were highlighted with 3 specific indicators:

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Waste Disposal per Capita;

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Landfill Lifespan;

-

Green Space per Capita.

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The need to reduce waste by 30% follows The City of Cape Town's Sustainability Report of 2005 stating that no landfill site in Cape Town had a lifespan extending longer than 18 months. (City of Cape Town, 2005: 23) There were plans for the expansion of the existing four sites but this could not be regarded as a long term solution, because the expanding of existing sites could negatively impact on the ecology of the areas and would reduce the amount of land that could be used for housing or agriculture. What further compounded the problem was that the amount of waste disposed of per capita per year in Cape Town had increased from 513 kg per person in 1999 to 659 kg per person in 2004. (City of Cape Town 2005: 24) This worked out to 1.8 kg per person per day. The total amount of waste disposed of through landfill had also increased from 1 420 000 tonnes to 2 034 837 tonnes in 2004. This was equal to a 43% increase in waste disposal since 1999 and an 18% increase since 2003.

The City of Cape Town's Sustainability Report of 2005 states the following: "These figures simply highlight a growing problem in Cape Town which needs to be dealt with immediately. The most effective way to reduce the amount of waste sent to landfills would be to institute a mandatory recycling system for all residents of Cape Town, integrated into the current solid waste removal system." (City of Cape Town, 2005: 24) The document also suggested regulation within the consumer goods industry to reduce the unnecessary packaging of goods.

The second local issue that related to DEAT's budget was the need to

protect green open space in Cape Town. The City of Cape Town's Sustainability Report of 2005 identified it as important because it kept the air clean, provided recreational space and increased the economic value of the city as a destination. (City of Cape Town, 2005: 13) The relevant indicator was called Green Space Per Capita: The extent of green space within Cape Town, per person was 62m². Green Spaces were defined as formally protected areas (provincial and local) and provincial and municipal parks and gardens.

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This indicator excluded the Table Mountain National Park. The total extent of Green Space was 195 km², 39 km² is part of the Cape Metropolitan Open Space System and 156 km² is part of the nature areas. With a Cape Metro population figure of 3 088 433 in 2004, the Green Space is 12.6 m² of open space per person and 50.5 m² of nature areas per person.

There are five other issues that do not fall within the 2020 vision of The City of Cape Town Integrated Development Plan for 2004/5 but are reported on in The City of Cape Town Sustainability Report of 2005 that directly relate to DEAT's mandate. These include:

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- Particulate Matter Exceedances (Air Quality);
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- Extent of Invasion by Alien Invasive Species;
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- Extent of Natural Vegetation Conserved;
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- Extent of Urban Sprawl;
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- Coastal Water Quality.

Air pollution is a priority in Cape Town because of its negative health effects and because it contributes to the brown haze that hangs over Cape Town. Air pollution is measured using particulate matter exceedances. These exceedances are monitored in Cape Town city centre, Goodwood and Khayelitsha. In Cape Town city centre and Goodwood the UK 24-hour guideline for particulate matter had been exceeded regularly since 1995 and in Khayelitsha, where monitoring only started in 1999, the highest number of exceedances was recorded.

The UK National Air Quality Information Archives state that more than 75 exceedances of the guideline per year represent a moderate to high risk of negative health effects being experienced to sensitive individuals. Those who have respiratory complaints like asthma or who have diseases affecting respiratory systems, like Tuberculosis, are especially at risk. (City of Cape Town, 2005: 7)

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Invasive alien plants pose a great threat to biodiversity within the City of Cape Town. They are also a contributing factor to destructive wildfires and serve to reduce freshwater supplies. The City of Cape Town's Sustainability Report of 2005 estimates that a total of 25 000 hectares of invasive aliens need to be addressed. (City of Cape Town, 2005: 16) This is important considering Cape Town is located within the Cape Floristic Kingdom, one of the smallest of the world's floral kingdoms and one of the richest. (City of Cape Town, 2005: 14) Cape Town has a high proportion of endemic species and endangered species. Urban sprawl and rapid development is further diminishing land available for the Cape Floristic Kingdom to flourish. The average number of undeveloped hectares developed in Cape Town per year increased to an average of 1 232 hectare of land each year from 1998 to 2002. This was almost double previous averages. (City of Cape Town, 2005: 17)

Coastal water quality, measured by amount of faecal coliforms per 100 ml, is another environmental issue highlighted in The City of Cape Town's

Sustainability Report of 2005. Poor water quality was reported at a number of beaches and this could affect environmental sustainability and tourism potential. The report stated the following: "Maintaining our coastal ecosystems is an important part of preserving biodiversity in the City and ensuring that marine ecosystems remain viable in the future. Furthermore, Cape Town's beaches are one of the main tourist attractions of the City, and ensuring that the beaches are clean and do not pose a health risk to users is fundamental to securing this tourist resource." (City of Cape Town, 2005: 20)

Looking at the listed indicators and goals from a national perspective, the executive summary of South Africa's National State of the Environment Report of 2006 recognised biodiversity and ecosystem functioning as a major area of concern. "The general state of biodiversity and ecosystem functioning is not good. While conditions differ for different ecosystems and parts of the country, in general South Africa's biodiversity and ecosystem health are declining. Human pressure on ecosystems is increasing, particularly in areas of high biodiversity." (South Africa. DEAT, 2005a: 11).

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On the issue of marine systems, the executive summary of South Africa's National State of the Environment Report of 2006 said that some places were under threat like the West Coast. Others appeared good but there were gaps in the data available. (South Africa. DEAT, 2005a: 12) On the issue of waste management, South Africa's National State of the Environment Report of 2006 stated that almost 50% of the population were not receiving regular waste collection. While metropolitan municipalities provided a complete waste collection service, remote rural municipalities in many areas did not deliver a service at all. (South Africa. DEAT, 2005b: 254)

Given the above statements, it would be safe to assume that, by and large South Africa's National State of the Environment Report of 2006 reveals that Cape Town's sustainability indicators are supported nationally. Of course there would be variations in pollution

levels in different localities, diverging from national standards and targets, but it could be assumed that the overlap between local sustainability indicators and national goals reveals shared general concerns. What does this say about the current prioritisation of funding within the DEAT budget?

There are many possible interpretations of how DEAT's budget could be prioritised to better reflect the issues highlighted in The City of Cape Town's Integrated Development Plan of 2004/5 and The City of Cape Town's Sustainability Report of 2005. In the section that follows, with the help of the context sketched by the above-mentioned documents and The National State of the Environment Report of 2006, I will analyse the merits of DEAT's budgeted expenditure for 2005. I make three specific critical statements about this budget: firstly, regarding the overall amount spent on the environment in the budget; secondly, regarding the priority given to various programmes within DEAT; and thirdly regarding individual items within the various programmes, highlighted by the locally driven documents, that were overlooked in DEAT's budget for 2005.

The most obvious critical statement is that the expenditure in DEAT's budget does not do justice to the serious nature of the environmental problems that are highlighted in Cape Town's Sustainability Report of 2005. The City of Cape Town's Sustainability Report
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2005 reveals a city headed on an unsustainable development path. The opening address of the mayor states this categorically: "there is an indication that Cape Town is moving away from our vision of a Sustainable City ..." (City of Cape Town, 2005: 4)

Similarly, South Africa's National State of the Environment Report of 2006 reveals the country's environment is in a crisis state. "Increasing air pollution and declining air quality are harming people's health. Natural resources are being exploited in an unsustainable way, threatening the functioning of ecosystems. Water quality and the health of aquatic ecosystems are declining. Land degradation remains a serious problem.

Up to 20 species of commercial and recreational marine fish are considered overexploited and some have collapsed." (South Africa. DEAT, 2005a: 2)

Fundamental change takes time, and drastic measures are required to change direction from an unsustainable to a more sustainable path of development. DEAT's budget allocation, specifically on the matters of biodiversity and conservation (R287.9 million), environmental quality and protection (R196.4 million) and marine and coastal management (R278.4 million), seem paltry in the light of the information about the state of the environment provided in South Africa's National State of the Environment Report of 2006, The City of Cape Town's Sustainability Report for 2005 and the goals aimed at in the 2020 vision of The City of Cape Town's Integrated Development Plan for 2004/5. DEAT has one of the smallest budgetary allocations and one of the primary focuses of that small budget is tourism. Tourism's allocation makes up 23% of the budgetary allocation in the Estimates of National Expenditure. (See Appendix 4) When these abovementioned allocations are considered in terms of all the votes in the Estimates of National Expenditure of 2005, the amounts seems insignificant. (See Appendix 7)

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While there are other departments who focus on environmental issues, for example, the Department of Water Affairs and Forestry, DEAT is the only department specifically tasked with protecting the aforementioned collapsing fish species, declining air quality and threatened ecosystems. The description of South Africa's environment in South Africa's National State of the Environment Report of 2006 should ring alarm bells through the economy,

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bells, that would require a substantial increase in expenditure within DEAT's budget to silence.

The second point of critique highlighted by The City of Cape Town's Sustainability Report of 2005 and the 2020 vision of The City of Cape Town's

Integrated Development

Plan of 2004/5 is the inadequate prioritisation of waste management, and biodiversity and conservation within DEAT's budget. DEAT instead prioritises tourism above these two items. This seems short sighted given that tourism heavily relies on the environment to function. Without a pristine, well-managed environment South Africa's tourism industry would collapse. While it is true that tourism could positively influence biodiversity and conservation, it is biodiversity and conservation that should be the priority, and tourism the secondary budget allocation. Secondly, both the above-mentioned documents call for a 30% reduction in Cape Town's waste generation. This urgency is not reflected in DEAT's budget where waste management is mentioned but not highlighted as a top priority. This is despite The City of Cape Town's Sustainability Report of 2005 mentioning that most landfill sites in 2005 only had an 18 month lifespan left. (City of Cape Town, 2005: 23)

With regard to the individual allocations within each of DEAT's six programmes, there are a number of useful individual items that The City of Cape Town's Sustainability Report of 2005 highlights that could have been taken up at a national level. Firstly, when discussing the indicator on waste disposal per capita, Cape Town's Sustainability Report calls for the consumer goods industry to be regulated so as to reduce the unnecessary

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The executive summary of DEAT's National State of the Environment Report of 2006 states that "the condition of South African environment is deteriorating"; that "increasing pollution and declining air quality are harming people's health"; and that "natural resources are being exploited in an unsustainable way, threatening the functioning of ecosystems". (South Africa. DEAT, 2006a: 2)

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packaging of goods. (City of Cape Town, 2005: 24). Secondly, The City of Cape Town's Sustainability Report of 2005 identifies the need to conserve green space in the City. (City of Cape Town, 2005: 13) This could be extrapolated to Green

Space for all South African cities. Thirdly, it highlights the need to keep a close watch on water quality on beaches, given that beaches are a tourist attraction and a source of important revenue. These are all issues that would have application beyond the borders of Cape Town municipality and could have added value to environmental protection in 2005, if they were seriously considered in the national budgetary process.

1. 3. Using the insights of adaptive management to reconstruct DEAT's budget

If DEAT is to effectively address the issues raised in The City of Cape Town's Sustainability Report of 2005 and The City of Cape Town's Integrated Development Plan of 2004/5 in a manner that is keeping with other national priorities revealed by South Africa's National State of the Environment Report for 2006, then the following interventions are needed:

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DEAT needs to focus its activities on biodiversity management, coastal and marine management and environmental quality;

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Tourism should be a separate department;

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A Department of Sustainable Development that also acted as an environmental protection and prosecution agency should be created;

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A Standing Committee for Sustainable Development should be created;

-

DEAT needs to expand its budget to more than double its current figure.

If DEAT is to overcome the above-mentioned national environmental crisis then the department needs to focus on its mandate exclusively, that is to protect the environment in South Africa. (South Africa. National Treasury, 2005b: 649) I suggest DEAT's

activities be confined to three programmes: Biodiversity and Conservation, Marine and Coastal Management, and Environmental Quality. Tourism should be a separate department. Expenditure within DEAT's three programmes would need to be increased significantly.

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One example of how this expenditure could be put to good use would be the promotion of Green Open Spaces in Cities and the extension and adoption of new areas for conservation. Access to safe Green Space was not addressed at all in DEAT's budget, even though it featured in The City of Cape Town Sustainability Report of 2005 as an indicator. Other areas where extra revenue could be put to good use include improving waste management, air quality monitoring and coastal and marine management.

The proposed separate Department of Sustainable Development would focus on the enforcement of environmental legislation and on the monitoring of sustainability indicators throughout government, at a national, provincial and local level. The rationale behind separating these two functions, i.e., of environmental protection and environmental conservation, is to allow environmental scientists and conservationists to focus their attention on restoring ecosystem health and preventing further collapse, while another department (i.e. the proposed Department of Sustainable Development) goes after perpetrators and ensures that other departments are not transgressing environmental legislation.

The new proposed Department of Sustainable Development would be involved in managing large amounts of data from local government sustainability indicators and integrated development plans. The collection, monitoring and interpreting of this data would become a major function of the proposed Department of Sustainable Development as would the promulgation, revision and implementation of environmental legislation.

However, it would be insufficient just to perform this policing and monitoring function.

The proposed Department of Sustainable Development would also need

to provide some form of incentive to improve departmental programmes in relation to environmental concerns or a disincentive to avoid environmental transgression. Although government departments do not always themselves impact directly on the environment, they do substantially influence the framework within which various sectors of the economy operate. The idea is to influence the economic framework that government is setting so that it is more sensitive to ecosystem limitations and environmental concerns.

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The proposed Standing Committee for Sustainable Development could use the information provided by the proposed Department of Sustainable Development to oversee sustainability indicators in the various departments. It is envisaged that much like The National Assembly Standing Committee on Public Accounts (SCOPA) acts as Parliament's watchdog over the way taxpayers' money is spent by the executive, so too can the Standing Committee on Sustainable Development hold various government departments and state institutions to account for their activities that impact on the environment. They would have the power to call heads of portfolio committees and departments to account for their inability to adhere to locally generated and nationally aggregated sustainability indicators. It is suggested that this committee, like SCOPA, be able to recommend that the National Assembly take corrective action against departments if necessary. (Foster, 2008)

Another way of encouraging sensitivity to environmental concerns in the budget process, could be to make sustainability indicators, as discussed in chapter three, part of the government's departmental performance monitoring system. This would mean that government departments would need to report in their Annual Reports, and to the proposed Standing Committee on Sustainable Development, not only on how they had spent their funds and achieved their performance targets, but also if they had been able to develop any processes or requirements within their sectors that

would result in improved environmental interaction. Disincentives could operate in the form of increased environmental prosecution and implementation of stringent environmental legislation.

In the section that follows, I will follow the same procedure as used above in assessing, from the perspective of adaptive management, the budget of the Department of Trade and Industry (DTI), and making proposals towards restructuring it.

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2. The Department of Trade and Industry (DTI)

2.1 Comparing DTI's Estimated National Expenditure with DTI's Annual Report 39

The Department of Trade and Industry's vision was to create an adaptive economy with "accelerated economic growth", "employment creation" and "greater equity". (South Africa. National Treasury, 2005b: 797) More than R3 billion was allocated to the department to achieve these ends. The department had seven programmes. They are listed in terms of the descending order of allocation priorities: Enterprise and Industry Development at R1.18 billion; the Enterprise Organisation at R986.65 million; Trade and Investment South Africa at R358.1 million; Administration at R250.2 million; Consumer and Corporate Regulation at R117.9 million, and R100.8 million for International Trade and Economic Development. The DTI spent more than R3.59 billion for 2005/6. (South Africa. DTI, 2006: 94)

The Enterprise and Industry Development Programme with a budget of R1.8 billion aimed to assist in developing policies and strategies that promoted competitiveness, equity and enterprise development. The DTI's annual report records (South Africa. DTI 2006: 22) that an industrial policy document was created. Building skills, technology and infrastructure platforms in the economy was achieved by approving 71 projects that contributed towards this goal, supporting 927 researchers, 2 624 students, 401 enterprises (60% of which were Small Medium and Micro Enterprises and 7% of which were BEE), accrediting 106 facilities and revising 524 standards. To increase

the contribution of small business to the economy they created 6 small business support institutions to provide micro-credit through the APEX fund. There was further financial support to small enterprises through Khula Enterprise Finance and a national integrated small enterprise strategy was developed.

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See Appendix 5 for a graphic representation of the estimated programme expenditure for DTI in 2005.

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To further boost the contribution of small enterprises to the economy, the DTI developed a co-operative strategy and created an incentive scheme for co-operatives. To address equity, they focused on black economic empowerment through finalising phase 2 of the Black Economic Empowerment codes of practice. They held a workshop in conjunction with the Association of Women's Business Centres on advancing women's entrepreneurship. (South Africa. DTI, 2006: 22)

The Enterprise Organisation strived for growth, equity and employment creation by providing financial incentives to enterprises. A total of R986.65 million was allocated to this programme in 2005. It was expected to fund three programmes: an incentive administration programme that managed and implemented existing business incentive schemes; a new incentive development that was responsible for developing new incentive schemes like the film industry rebate system; and a business development and aftercare service that assisted Small Medium and Micro Enterprises to access DTI incentives and business networks. (South Africa. National Treasury, 2005b: 814)

The Enterprise Organisation, as part of their plan to develop new incentive schemes, completed the design of a business process outsourcing incentive programme to which R70 million was allocated. Within the six existing incentive schemes: a draft policy proposal was compiled for industrial development zones, ten new critical infrastructure projects were approved worth R8.5 billion (six in mining, 3 in

manufacturing and 1 in tourism), a total of 1 924 small and medium enterprise development programmes with an incentives value of R2.2 billion were approved (42% in tourism, 58% in manufacturing mostly agro processing, metals and chemicals), nine strategic industrial projects were granted with a total incentive allowance of R2.3 billion, a total of 5 feature films, two telemovies, two miniseries and one television series were approved with a film incentive value of R70.9 million and in the export market and investment assistance 547 firms were assisted to the value of R35.3 million.

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Equity issues were also addressed by this programme with 577 firms being assisted to the value of R29 million to improve their management and quality systems, and a total of 214 presentations were made at stakeholder workshops for the support of Small Medium and Micro Enterprises. (South Africa. DTI, 2006: 30)

The third major item on the DTI budget was Trade and Investment South Africa. More than R358 million was allocated to Trade and Investment South Africa that promotes growth sectors in the economy by developing South Africa's capacity to export to various markets as well as increase direct investments in the country. (South Africa. DTI, 2006: 818, 820). The programme promotes investment opportunities through trade missions and exhibitions, export development and promotion, providing training for exporters as well as export credit insurance and customised sector programmes where government builds partnerships with its social partners to overcome obstacles to investment, exports and competitiveness.

Trade and Investment South Africa's Investment Promotion and Facilitation Programme held 7 investment seminars, 7 pavilions, 24 sector specific presentations, 15 inward and 7 outwards investment missions, 30 sector specific briefs and two workshops to discuss the investment promotion strategy and framework. The Export Promotion and Facilitation Sub-programme circulated the national export strategy to all export councils and industry

forums, they published a total of 12 trade lead bulletins with 577 business opportunities, distributed 4000 copies of export publications, 29 national and mini pavilions were held abroad and three in South Africa, 40 outward bound trade missions were conducted and 30 inward bound trade missions organised. In the Customised Sector Programme, which was designed to develop partnerships between government and its social partners, a total of 15 project profiles were endorsed for high impact customised sector projects and a total of 3 sector development strategies were approved with 8 awaiting approval. (South Africa. DTI, 2006: 34)

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The fourth financial priority in the Department of Trade and Industry was Administration. It was allocated R250.22 million of the DTI budget. The office of the Director-General Sub-programme experienced the largest increase from R25.8 million in 2001/2 to R56.23 million in 2005/6. This is because this sub-programme has incorporated the economic research and policy coordination functions. Other functions include the internal audit, monitoring and evaluation, agency management and the strategy unit. (South Africa. National Treasury, 2005b: 802, 803)

The learning centre of the Administration Programme delivered 22 skills programmes to more than 600 employees. Capacity building of the learning centre was extended to 17 foreign economic representatives, 42 marketing officers, 95 new recruits and 29 designated heads of missions from the department of foreign affairs. A total of 27 interns were appointed, seven were provided permanent employment, 115 were furthering their studies through a departmental bursary scheme, and 45 learners were participating in the Adult Basic Education and Training Programme. A business model and memorandum of understanding was drawn up for the secondment of industry experts in the DTI to assist with identified projects and it was adopted by the industry forum. The office of the chief financial officer set up a help desk facility to centralise the receiving of invoices and dealing with enquiries. Information and Communications Technology

set up an IT disaster management plan. Anti-corruption/ethics building workshops were held in DTI for fraud prevention. A compliance calendar was developed by the risk management unit and a risk collaboration database was developed. A total of 99% of senior management had disclosed their financial interests. (South Africa. DTI, 2006: 13)

The fifth financial priority on the DTI budget was Consumer and Corporate Regulation with a budgetary allocation of R117.9 million. The purpose of this sub-programme was to develop and implement legislative and regulatory solutions to facilitate easy access to redress and efficient regulatory services. It has three business units: policy and legislation, regulatory services and enforcement and compliance to achieve these ends. (DTIENE 2005/6: 811) Consumer and Corporate Regulation's Policy and Legislative Development Programme developed the Draft Company Bill, and the Consumer Credit

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Act had been approved by the National Assembly. In the Enforcement and Compliance Programme, a total of 27 reactive investigations were finalised and three reports for company investigations were approved by the DTI national Minister and nine complaints resolved. (South Africa. DTI, 2006: 26, 27)

The sixth financial priority on the agenda of the Department of Trade and Industry was International Trade and Economic Development with R100.8 million allocated to this programme. The programme sought to develop international trade and investment links with key economies globally. It promoted economic development by negotiating preferential trade agreements, supporting a strong and equitable multilateral trading system, and fostering economic integration in Africa within the NEPAD framework. The programme had three sub-programmes: International Trade Development, African Economic Development and International Trade Administration. (South Africa. National Treasury 2005b: 806)

The International Trade Development Sub-programme had a number of

trade agreements either finalised or under discussion, for example: a free trade agreement with the European Free Trade Association was to be ratified, The European Union Enlargement Protocol was signed and ratified; three rounds of technical discussion took place between South Africa and the European Union on a Free Trade Agreement to improve market access; there had been a breakthrough in a five-year negotiation on tariff schedules in the automotive sectors; a free trade agreement with China was under research, India had yet to confirm the mandate to launch trade negotiations with SA; a Free Trade agreement with Mercosur was under discussion; South African Customs Union and US free trade agreement negotiations were being discussed; an India-Brazil-South Africa Summit had been scheduled; and South Africa participated in the World Trade organisation and African Union trade ministerial meetings. A total of 5 technical missions, three presidential missions, one deputy ministerial mission and one business mission were carried out in Africa. There were two ministerial missions to Kuwait, UAE, Bahrain, Yemen and Israel/Palestine.

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A total of 5 agreements were signed, 2 with Bahrain. A memorandum of understanding was underway for economic cooperation with Madagascar. An agreement was signed with Kuwait on bilateral investment promotion and protection. (South Africa. DTI, 2006: 16, 17)

The seventh financial priority for DTI was the Marketing Sub-programme with an allocation of R81.3 million. Its function was to increase public awareness of DTI's products and services. It had three sub-programmes to achieve these ends: brand management, marketing communication and marketing distribution. (South Africa. National Treasury, 2005b: 821) The marketing programme of the department facilitated a hundred events and exhibitions, 18 business forums/workshops, an open day exhibition at the DTI campus, and DTI consumer and business awards. A total of 4 media

engagements are recorded for the year and 60 publications listed but without any mention of titles or readership. The division said they had reached 72 million people through external publications. The Marketing Distribution Sub-programme reports that 626 442 enquiries were handled successfully and 98% of all enquiries were resolved within the 48 hour turnaround time. It also recorded 12 circulation audit reports with user feedback results. (South Africa. DTI, 2006: 36)

2. 2 Using adaptive management as a critical tool of analysis in DTI's budget

In this section, I will select priorities mentioned in the City of Cape Town's Integrated Development Plan of 2004/5 and sustainability indicators mentioned in Cape Town's Sustainability Report that directly relate to the activities of DTI. I use these indicators to develop a critical analysis of the budget process. I also discuss the importance of using other environmental sustainability indicators, that do not directly relate to DTI's mandate but which will affect DTI's programme and stated goals in the long term.

I selected two goals from the City of Cape Town's 2020 vision in The City of Cape Town's Integrated Development Plan of 2004/5 that was annexed in The City of Cape Town's Sustainability Report of 2005. (City of Cape Town, 2005: 47) 179

These selected goals were especially relevant to the DTI's long-term goals of accelerating growth, employment and equity. They were:

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Keeping unemployment less than 8%; and

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Doubling the average real per capita income while reducing inequality.

In The City of Cape Town's Sustainability Report of 2005, the following indicators were relevant (City of Cape Town 2005:37-40):

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The percentage of the economically active population that is

employed;

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Gross Geographic Product or the total value of goods and services by sector per annum;

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Inequality measured by income disparity in households.

In The City of Cape Town's Sustainability Report of 2005, they quote Statistics South Africa having recorded in 2004 that the percentage of economically active people unemployed was 23%. They regarded unemployed people as those people who were not currently working, who wanted work and who had taken active steps to look for work or started some form of self-employment. The statistics showed that unemployment had risen by 10% since 1997. (City of Cape Town, 2005: 37)

Levels of inequality were measured by assessing income disparity statistics. This indicator measured the percentage of households earning below R18 000 per annum, those earning between R18 001 and R132 000 and those households earning R132 001 or more per annum. The statistics showed that in 2004 more than 17% of households earned less than R18 000 per annum or a little more than R12 a day per person; two thirds of households earned between R18 000 and R132 000 per annum; and slightly more than 18% earned over R132 000 or a little over R90 a day per person. The average was R87 811 a year per household, with many households earning far less than this. (City of Cape Town, 2005: 40)

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Unlike DEAT, the top priorities of the DTI budget were in line with these pressing local concerns of unemployment and income disparity. DTI spent the highest proportion of its budgetary allocation on Enterprise Development, i.e. R1.18 billion, with a strong focus on developing small enterprises. In doing this, they created employment opportunities. They promoted the financing of Small Medium and Micro Enterprises

through various channels like the Apex Fund and the Khula Enterprise Finance. DTI also developed the Co-operatives Development Bill and policy to promote the development of co-operatives. They also focused on equity and empowerment by implementing broad-based Black Economic Empowerment (BEE) codes of practice; establishing the Black Economic Empowerment Advisory Council; and promoting skills development among women. (South Africa. DTI, 2006: 22, 23)

However, despite DTI being able to align their goals directly with that of The City of Cape Town's Integrated Development Plan of 2004/5 and three of Cape Town's sustainability indicators, it was not possible to determine whether any of DTI's interventions had impacted on income inequality within Cape Town, or on Cape Town's Gross Geographic Product or its unemployment rate. DTI did not give this kind of feedback on departmental expenditure. It would be helpful, for example, from a local perspective to have had a breakdown of how much of DTI's national funds were actually spent in promoting business in Cape Town, and what types of small and medium size businesses were being promoted. It would be useful to know how all of DTI's programmes had impacted on the three local economic indicators mentioned above. This would enable improved future national government expenditure and intervention. It is true that the connection between some DTI interventions and local economic indicators would often not be able to be conclusively established, but well-researched projections can still be helpful.

This kind of local information would be useful throughout all the sub-programmes. It would be helpful to know, for example, in the Enterprise Organisation Programme how many Cape Town applicants were assisted in the Business Development and After Care sub-programme, what the businesses were and how they had contributed to increased

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income in households. Similarly, in Trade and Investment South Africa it would be

useful to know what Cape Town industries had received export training, and what sectors in Cape Town were being promoted. In the International Trade and Economic Development Programme it would be useful to know what bilateral and multi-lateral trade agreements were likely to benefit Cape Town with its specific competitive advantages and environmental constraints. Moreover, what sectors would benefit from these agreements and how these agreements could assist in addressing unemployment in Cape Town.

Moreover, localised information should not only be made available regarding economic indicators but also for environmental and social indicators within a specific area. When reading a national budget like DTI in the absence of localised data about environmental concerns, it is difficult to gauge if a particular expenditure item had been effective from a Cape Town perspective or not. To illustrate with an example, if DTI wanted to assist Cape Town in achieving its target of reaching a less than 8% unemployment rate by 2020 (City of Cape Town, 2005: 47), then specific environmental indicators would also be needed.

This is because if Cape Town were to decrease its unemployment rate by promoting industries that emitted air pollution this would solve one problem, unemployment, and create another problem, respiratory disease. This follows Cape Town's Sustainability Report of 2005 stating that air pollution is a potential health problem in the City, especially in areas like Khayelitsha where high incidences of Tuberculosis, a disease affecting the respiratory system, are found. (City of Cape Town, 2005: 7) It is for this reason that national government interventions require a thorough understanding of the competitive economic advantages, environmental limitations and social opportunities of different cities and rural areas for them to be successful.

The kind of information transfer called for above would necessitate increased coordination between the City of Cape Town's departments that were involved with industry and trade development and the national government, as well as increased

interaction between the City of Cape Town's Department of Environmental Resource Management and DEAT. It would, in fact, call for greater integration between all departments within local and national government.

In conclusion of this critical analysis of DTI's budget, while DTI's goals are aligned with local goals and indicators it was not possible, due to insufficient local information available in the DTI budget, to ascertain whether the programme expenditure actually resulted in a factual increase in income per capita or an increase in employment or a decrease in income disparity in the City of Cape Town. A reader of the Estimates of National Expenditure of the South African Budget has no way of knowing whether a national budgetary item like the promotion of trade links with China might have resulted in an increase in the Gross Geographic Product in Cape Town, or if it had any environmental impact in South Africa. While it is true that this information might not provide conclusive connections between expenditure allocation and impact, if this information were available it would allow for better researched decisions regarding future national expenditure allocation.

Secondly, DTI does not include longer term environmental considerations into any of its programmes. Adaptive management guidelines require that while decisions should be made from within a local context, the local context should also be viewed out of the perspective of multiple scales of time. DTI's budget disregards environmental considerations and therefore lacks this multi-scalar perspective and instead interprets all its activities in terms of the shorter term social sustainability goals of equity and unemployment and the economic sustainability goal of increased gross geographic product.

In the section that follows, I will reconstruct DTI's budget, bearing in mind that Cape Town's Sustainability Report for 2005 highlighted air pollution, lack of Green Open Space and the need to reduce waste as some of the main areas of concern.

Moreover, I shall also consider The City of Cape Town's Integrated Development Plan of 2004/5 that called for a 30% reduction in waste by 2020 and access to safe green space within walking distance for all. (City of Cape Town, 2005: 47)

2. 3 Using the insights of adaptive management to reconstruct DTI's budget

There are a number of ways in which DTI could include longer term environmental considerations into its departmental programmes. They range from all DTI projects only receiving approval after local environmental impact assessment processes had been completed to the softer option that all DTI expenditure allocation should be subject to locally generated environmental indicators, as well as economic and social sustainability indicators. The department could also provide financial incentives for industry to redesign production systems so that they were beneficial to the environment. In this section, I focus on how DTI's expenditure allocation could better respond to locally generated environmental sustainability indicators, so as to make the DTI more sensitive to the multi-scalar effects of industry on the environment and hereby demonstrate the impact of Norton's adaptive management methodology. A more empirical study of sustainable production processes falls outside the scope of this thesis, but would provide a valuable additional perspective.

The Enterprise Organisation's provision of financial incentives to industrial development zones, critical infrastructure projects and strategic industrial projects could be subject to these projects passing certain environmental standards. A DTI performance indicator that listed how many DTI projects had complied with environmental standards would be helpful. Environmental impact assessments are already mandatory for industrial processes that are likely to have environmental impacts.

It would be even more beneficial if these industrial projects were subject to continuous assessment by the local municipal authority in the area in which

they were situated, for example, to ensure that Cape Town's particulate matter exceedances for air pollution were honoured, an industrial project emitting air pollution would be required to

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continually monitor particulate matter exceedances and report on these findings to the Cape Town municipality. If DTI funded projects that were found to exceed these levels, then the department's performance indicator would be negatively affected.

Similarly, it would be useful for DTI to investigate the possibility of introducing specific financial incentives, like subsidies or tax holidays, to begin environmentally beneficial industries. The City of Cape Town's Sustainability Report of 2005 and The City of Cape Town's Integrated Development Plan of 2004/5 both highlight waste as a serious issue. It would thus be useful for DTI, in response to the IDP goal to reduce waste by 30% in 2020, to begin creating financial incentives for additional companies to begin working in the waste processing industry in Cape Town. This could include tax holidays for recycling companies starting out or even subsidies for the creation of recycling companies. Potential performance indicators to measure the Enterprise Organisation's progress in this regard could be the number of functioning waste industries funded by DTI. The proposed above-mentioned initiative to DTI's expenditure allocation represents an adaptive management approach in that business activities are being guided by locally generated IDP goals and sustainability indicators.

Trade and Investment South Africa's Investment Promotion and Facilitation subprogramme presents further opportunities for the DTI to address longer term environmental issues. If, for example, DTI was aware of Cape Town's desire to reduce waste and focus on recycling, then when the programme hosted trade investment seminars, pavilions, presentations, missions and workshops, they could specify that Cape Town was specifically looking for investment in this area. Similarly, if in terms of trade, Cape Town was specifically producing industrial products that resulted in low emission

levels then DTI could seek to export products from this region to other countries that expressed a need for environmentally friendly goods. A hypothetical example could be a low-emission vehicle. Trade and Investment South Africa could measure its progress in this regard with performance indicators that measured the percentage of South African imported products that were environmentally friendly and the percentage of South African exports that contributed to lower environmental impacts.

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The Administration Programme, that boasts a learning centre that develops training programmes for DTI's (South Africa. DTI, 2006: 13) employees and other government staff, would be the ideal place to begin training staff members in environmental awareness. They could focus on training them to develop national environmental sustainability indicators from local environmental sustainability indicators and also train them to develop performance indicators that related to these sustainability indicators, within the DTI's programmes. Courses in Environmental Impact Assessment and ISO 14000 could be introduced to DTI's more than 600 employees so as to make them aware of the need to assess industrial impacts on specific local environments over the longer term. This awareness raising could be extended to foreign economic representatives, marketing officers and heads of missions. The idea would be to market South Africa's investment potential with all the relevant information about local environmental opportunities and constraints. A possible performance indicator in the Administration Programme could be the number of environmental awareness workshops held among staff in DTI and/or the number of DTI staff trained in environmental impact assessment procedures, the monitoring of sustainability indicators as well as linked performance indicators.

Consumer and Corporate Regulation's Policy and Legislative Development Programme could begin researching how environmental legislation could encourage companies to make use of environmentally sound production and distribution processes. The development of this legislation could be driven by local

sustainability reports. DTI could, for example, if it found that Cape Town's air pollution problem was a national problem, look at ways of developing sector specific environmental legislation that would force companies to reduce emissions. The performance indicator that could monitor progress in the Consumer and Corporate Regulation's Policy and Legislative Development Programme could be the number of successful prosecutions for environmental transgressions in industry.

The International Trade Development Programme could present an opportunity to research how international trade impacted on the environment and investigate possible alternative trade agreements that might better serve the long term interests of the

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environment and ultimately the economy. The environmental topics chosen for research could be done with the help of local sustainability reports. In the case of Cape Town, it might be useful to research alternative energy vehicles since car emissions are one of the biggest causes of air pollution in Cape Town. A series of technical, presidential and business missions could be carried out in Africa, Asia, the United States of America, South America and Europe on a selection of environmental concerns that could be addressed through establishing useful trade links. A possible performance indicator for this programme could be the percentage of South Africa's exports that are environmentally friendly.

The Marketing Programme of DTI could head up the discussion surrounding the use of environmental sustainability indicators in industry by hosting industry events, exhibitions, business forums/workshops, open-day exhibitions, consumer and business awards, media engagements and publications that discussed this topic. This discussion could be informed by local sustainability reports. The division states that in the past they have reached 72 million people through external publications. (South Africa. National Treasury, 2005b: 36) This vast readership presents an opportunity for the DTI to openly

discuss the longer term impacts of South African industries and international trade on the environment. Possible performance indicators for progress made by the Marketing Programme of DTI could be number of awareness raising sustainability events hosted in one year, and the number of articles on sustainability in industry published by the department.

In conclusion, DTI's budget, through the introduction of performance indicators that are directly related to locally generated environmental sustainability indicators, would go a long way to making trade and industry in South Africa more sensitive to local environmental concerns. In the long-term, the outcome of this increased environmental sensitivity would be a more sustainable economy. In the section that follows, I will investigate the impact of an adaptive management approach on the Department of Agriculture's budget.

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3. The Department of Agriculture (DOA)

3.1 Comparing DOA's Estimated National Expenditure with DOA's Annual Report 40

The DOA aimed to lead and support sustainable agriculture and promote rural development through six key strategies: ensuring access to food, eliminating skewed participation and inequity, maximising growth, employment and income, improving the sustainable management of resources and ecosystems, ensuring efficient governance and information systems. The above-mentioned strategies were implemented by nine different programme divisions within the department. A total of R1.68 billion was allocated to the DOA in 2005/6 in the Estimates of National Expenditure of 2005. (South Africa. National Treasury 2005b: 579, 580) A total of almost R1.88 billion was spent. (South Africa. DOA, 2006: 70)

In the Department of Agriculture's Budget of 2005, the first financial priority was the Farmer Support and Development Programme. More than R476.79 million was allocated to this programme that ran five sub programmes: the Farmer

Settlement, Agricultural Finance and Co-operative Development, Food Security and Rural Development, Agricultural Risk and Disaster Management, and the Registrar of Co-operatives. (South Africa. National Treasury, 2005b: 586, 587)

The Farmer Settlement Sub-programme developed a Comprehensive Agricultural Support Programme (CASP) that provided post-settlement support to the beneficiaries of land reform. A total of 542 projects were started and 89 000 beneficiaries assisted by March 2006 by CASP. Agricultural Finance, in an effort to improve community based financial services, established a total of 84 agricultural co-operatives. The Food Security and Rural Development created a Food Insecurity Vulnerability Information Mapping System (FIVIMS) that was piloted in Sekhukune to create a model of food insecurity and to determine a programme of action.

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See Appendix 5 for a graphic representation of the estimated programme expenditure for DTI in 2005.

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Agricultural Risk and Disaster Management disseminated information on climate change and early warning monthly advisories. A drought management plan was gazetted for public comment. (South Africa. DOA, 2006: 32)

Agricultural Production was the second financial priority with R407.6 million being allocated to it. This budget supported the following sub-programmes: Animal and Aqua Production, Plant Production, Scientific Research and Development, Genetic Resources and provided transfers to the Agricultural Research Council. (South Africa. National Treasury, 2005b: 594, 595) Animal and Aqua Production saw the goat milk production scheme expanded to all provinces and the norms and standards for aquaculture compiled as well as support programmes for poultry and livestock developed. Plant Production ensured that guidelines for fruit and vegetable crops were completed. While the Scientific Research and Development Sub-programme distributed more than a 1 000

copies of norms and standards on extension and advisory services to all provinces and received business plans for agricultural advisory services from five provinces, the Genetic Resources Sub-programme prepared the Genetically Modified Organism Amendment Bill that was approved in May 2005. (South Africa. DOA, 2006: 43)

National Regulatory Services was the third spending priority in the DOA. A total of R230.5 million was allocated in the 2005/6 budget for managing the risks associated with animal and plant diseases and pests and for ensuring food safety and bio-safety. (South Africa. National Treasury, 2005b: 599, 600) The bulk of the money was spent on Agricultural Food, Quarantine and Inspection Services in the 2005/6 budget, followed by Animal Health and then Food Safety and Quality Assurance. Food Safety and Quality Assurance was addressed by beginning consultation on the processing of 14 Acts dealing with food control. Plant Health involved improving plant pest risk management systems and revising legislation on norms. Animal Health worked on improving animal disease reporting by empowering provinces to implement the national contingency plan for foot and mouth disease, and organising a Southern African Development Community workshop on Avian flu.

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The South African Agricultural Food, Quarantine and Inspection Services focused on improving border control, national plant production inspection services as well as plant and animal quarantine services. (South Africa. DOA, 2006: 52, 53)

The fourth major budget item was the Sustainable Resource Management and Use Programme with its budgetary allocation in the 2005/6 budget being more than R177.25 million. This programme was divided into the Water Use and Irrigation Development and the Land Use and Soil Management Sub-programme. Water use and Irrigation Development provided access to water resources by providing borehole and irrigation infrastructure and institutional support to people previously excluded from commercial

farming. The Land Use and Soil Management Sub-programme develop and implements policy, legislation and projects supporting sustainable agriculture and providing for the community-based Land Care Programme. (South Africa. National Treasury, 2006b: 597)

The Directorate of Water Use and Irrigation Development developed an underground water atlas, capturing data from more than 210 000 boreholes. This was planned to be used for assessing how much water was available for stock. The Directorate Land Use and Soil Management was developing a soil loss map. A total of 2 000 sites were selected for monitoring and the first progress report was completed. The SPOT 5 Imagery system was piloted in priority soil protection areas like Mthatha catchments in the Eastern Cape. (South Africa. DOA, 2006: 47)

The Administration Programme of the department was the fifth biggest financial priority with a total of R170.48 million being allocated. (South Africa. National Treasury 2005b: 585) They provide leadership through the activities of the Minister of the Department of Agriculture and senior management. Other focuses of the department included financial, procurement, legal and IT services, the internal audit function, human resources management and secretariat services as well as agricultural debt collection. The Annual Report for Agriculture did not report on these services. (South Africa. DOA, 2006: 29, 30)

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The Programme for Agricultural Trade and Business Development was the sixth priority in the budget with a total of R95.78 million being allocated to this programme. It had four sub-programmes: the Business and Entrepreneurial Development Programme, the Marketing Programme, the International Trade Programme and the National Agricultural Marketing Council. (South Africa. National Treasury, 2005b: 590) The Business and Entrepreneurial Programme developed commodity action plans for cotton and grain, and one for fruit was nearing completion. The International Trade Programme produced 29 position papers and reports on opportunities and constraints in

trade. The Marketing Programme distributed 42 200 marketing information booklets to all provincial departments for redistribution to farmers. (South Africa. DOA, 2006: 36)

The Programme for Communication and Information Management, the seventh financial priority of the department, had four directorates: the Agricultural Information Services Directorate; the International Relations Directorate; the Directorate of Education and Training; and the Grootfontein Agricultural Development Institute. (South Africa. National Treasury, 2005b: 602) The Agricultural Information Services Directorate Programme measured its information output in terms of the number of publications it produced and the frequency of website updates. The annual report records that 10 issues of Agrinews were produced and no new information packs were compiled because of a lack of capacity. The International Relations Directorate decided to treat the African Agricultural Development Programme, that offers technical assistance and support in agriculture regionally, as a line function rather than a trust and R5 million was allocated for this purpose.

The Directorate of Education and Training approved the ten-year Agricultural Human Resource Development Review and its suggestions were integrated into the DOA's programmes. The Grootfontein Agricultural Development Institute trained a total of 614 emerging farmers. (South Africa. DOA, 2006: 58)

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The Programme for Economic Research and Analysis was the eighth financial priority in DOA with a budget of R25.59 million being allocated. The programme supported the development and management of national agriculture databases and the collection and analysis of agricultural statistics. It also monitored the economic state of the sector and produced quarterly trend reports. There were two sub-programmes: Production and Resource Economics that provided production and resource economics information; and Agricultural Statistics that provided statistics on agriculture and

food security. (South Africa. National Treasury, 2005b: 592) The Production and Resource Economics Subprogramme released ten reports and the Agricultural Statistics Sub-programme published five statistical reports. (South Africa. DOA, 2006: 39)

The Programme for Monitoring and Evaluation was the smallest item on the budget with R7.96 million being allocated to this component. This programme, which was established in 2002/3, supported the other programmes in their implementation and monitoring of the DOA's strategic plan by undertaking programme evaluations and impact assessments.

It has two sub-programmes: Programme Planning and Monitoring and Evaluation. The

Directorate Programme Planning's aim was to get directorates to use the management by project approach. (South Africa. National Treasury, 2005b: 605, 606)

A total of 25

directorates were expected to be using the management-by-project approach by March

2006, however, it was not indicated if this was achieved. The Annual Report merely

stated that the system was piloted. They piloted the system in the Land Care and

Comprehensive Agricultural Support Programme projects in the Directorate Land Use

and Soil Management. The Directorate Monitoring and Evaluation's aim was to produce

an organisational performance and assessment report. It hoped to achieve this quarterly.

Organisational reports were completed, including the Annual Performance Report of the

department. (South Africa. DOA, 2006: 63)

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3. 2 Using adaptive management as a critical tool of analysis in DOA's budget

In terms of the DOA, whose mission it is to lead and support sustainable agriculture and promote rural development (South Africa. National Treasury, 2005b: 579), there is little in the City of Cape Town's Integrated Development Plan and its goal plan for 2020 that relates directly to this department's activities. If I had been analysing the DOA from the perspective of a rural farming town like Malmesbury in the Western Cape, then many more obvious discussion points might have arisen.

However, there are two sustainability indicators in The City of Cape Town Sustainability Report of 2005 that could be used to motivate for an extension of DOA's mandate to include urban agriculture. These are: the 23% unemployment rate recorded in 2004 and the income disparity statistic that shows that over 17% of households earn less than R18 000 a year. (City of Cape Town, 2005: 37, 40) I suggest that these statistics, when read along with the fact that many of the people who move to urban areas from rural areas have some agricultural skills, point towards the need to develop urban agriculture as an additional way for people to sustain themselves and reduce their vulnerability

Secondly, I wish to make a structural observation about the possibility of combining three of DOA's programmes. The DOA is the department, out of the three discussed in this thesis, that is in the best position to adopt an adaptive management approach. This is because the department has in place several programmes that would enable Norton's experimental approach to budgetary expenditure to succeed. There is a programme that is focused specifically on the sustainable management of resources (Sustainable Resources Management and Use Programme), a programme dedicated to economic research and analysis (Economic Research and Analysis Programme), and a programme that evaluates the overall performance of the department (Programme Planning, Monitoring and Evaluation).

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I propose that these three programmes, if they co-ordinate their activities effectively, could go a long way to creating, interpreting and feeding back the information necessary to make DOA's national budgetary expenditure sensitive to local needs over a short, medium and longer time period. Currently, the activities of these programmes are not sufficiently co-ordinated nor are they extensively enough funded to make the valuable contribution they could.

Thirdly, I suggest that a strong argument could be made that the Sustainable Resource

Management and Use Programme should receive top financial priority within the DOA. I make this suggestion based on the outcomes of The National State of the Environment Report of 2006 that describes South Africa's environment as "deteriorating" with natural resources "being exploited in an unsustainable way, threatening the functioning of ecosystems". (South Africa. DEAT, 2006a: 2) The Report identifies four major environmental priorities: water availability and quality; climate change; human vulnerability; and loss of biodiversity and ecosystem functioning as some of the country's major environmental priorities. 41

In the absence of a fully fledged national sustainability report that is linked to local sustainability reports, one could accept these as important sustainable resource management issues. They also all relate directly to DOA's mandate to lead and support sustainable agriculture and promote rural development. (South Africa. National Treasury, 2005b: 579) In 2005/6 the largest portion of the DOA budget, a total of R476.79 million, went to developing farmers and it is suggested that this expenditure now be shifted to ensuring sustainable agricultural practices. Given the current state of the environment, it would seem foolhardy not to focus on protecting the ecosystems that support agricultural practices in the first place.

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The National State of the Environment Report of 2006 was produced after DOA's 2005 budget, however, the data used to come to these conclusions would largely overlap with those that had been used to draw up DOA's budget. There is thus sufficient justification to use this Report to support the need to make changes in DOA's 2005 budget.

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3. 3 Using the insights of adaptive management to reconstruct DOA's budget

I will begin with discussing the above suggestion that Sustainable Resources Management and Use should be the top financial priority in the DOA. I propose that

additional budgetary expenditure be used to assist the DOA to fund the National State of the Environment Report priorities: water availability and quality, climate change, human vulnerability, and loss of biodiversity and ecosystem functioning. They could do this by investigating how these four top priority issues are reflected in local sustainability reports. Ideally it should have happened the other way around, in that the priorities should have been generated locally first. In municipalities where local sustainability reports have not been completed, they could be commissioned and funded by the DOA as well as other national departments. This would give the DOA detailed information in the form of indicators that measured the amount and quality of water available, climate change predictions and human consumption at a national as well as at local levels. The development of these kinds of indicators, and their availability, would put the DOA in a very good position to assess the impact of farming on the longer term functioning of specific ecosystems. It would enable them to make the necessary policy interventions and develop sustainable agricultural training programmes to steer the agricultural sector on a more sustainable course.

With regard to the suggested structural change to DOA's budget, I propose that the three programmes: Sustainable Resources Management and Use; Economic Research and Analysis; and Programme Planning, Monitoring and Evaluation be included in one programme as three functions so that their activities can achieve better co-ordination. I suggest the Sustainable Resources Management and Use Function be responsible for ensuring that municipalities are informed of the impacts of agricultural activities on the environment. They could develop awareness programmes, suggest alternative practices and conduct training programmes. The Function for Economic Research and Analysis could develop sustainability indicators to ensure that the impacts of agricultural activities on ecosystems are monitored. This should include social and environmental sustainability indicators not only economic sustainability indicators. They could be responsible for

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collecting and processing the information that is needed for these indicators. This Function would also be able to develop national indicators from the data collected. The Planning, Monitoring and Evaluation Function could then take on the task of interpreting how these indicators related back to DOA's departmental performance indicators.

Once could, for example, introduce the above-mentioned process into the Comprehensive Agricultural Support Programme (CASP) of the Farmer Support and Development Programme that provides post-settlement support to the beneficiaries of land reform. This could be achieved by the proposed Sustainable Resources Management and Use Function providing specific information and/or training to beneficiaries through local municipal departments on ecological concerns related to their specific areas like advice on water saving agricultural practices, soil erosion prevention, rotational crops, the use of organic fertilisers and composting techniques. The proposed Economic Research and Analysis Function could assist these municipalities to specifically develop locally-based indicators monitored by themselves on soil quality, water quantity and biodiversity. The proposed Evaluation and Monitoring Function could then take on the task of interpreting how these indicators related back to DOA's departmental performance indicators. They could compare, for example, the change in productivity of land to the amount of training received by farmers in sustainable environmental management practices, to establish precisely how effective CASP was at providing support to beneficiaries of land reform and ensuring sustainable environmental management. Ultimately, this information could be fed back into the departmental expenditure planning processes, the progress reported to the Standing Committee on Sustainable Development and the proposed Department of Sustainable Development.

If each department in government were to follow DOA's model and include within their departments a sustainable management of resources function, a research and analysis function, and an evaluation and monitoring function, then all departments would have

access to local and national statistics relating to the departmental activities as well as a set of sustainability indicators that were specifically related to their sphere of influence. It would then be the task of the proposed Department of Sustainable Development to

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interpret the data on a national level from all the various departments within government and feed this back into the budget planning process that takes place in MinComBud, the Budget Forum, the Budget Council, the Financial and Fiscal Commission, the joint MinMecs and the 4x4s.

Concerns about the inability of the departments to perform as regards to locally generated sustainability indicators could be taken up by the Standing Committee on Sustainable Development. The idea is to introduce an expenditure planning process where departments compare their interventions with local outcomes in the short term as well as over the longer term. If the funds allocated brought no positive change, then the programme intervention would be altered or discarded. In order to achieve this kind of sensitivity to local conditions, all departments operating under an adaptive management approach would need access to local sustainability indicator information as well as aggregated national sustainability indicators. The national sustainability indicators for all the departments would provide the national budgetary decision-making bodies like MinComBud with a means to prioritise the areas most needing attention, whereas the local statistics would enable the national government departments to tailor their individual expenditure allocations to the unique needs of particular municipalities. This kind of accuracy regarding what should be national priorities combined with a sensitivity to local conditions could only be achieved if there were stronger ties between local and national government so as to allow for regular data collection, national aggregation and revision of expenditure.

Finally, I propose that DOA broadens the mandate of the department to include extending agriculture to urban areas. It is an oversight on the part of the

DOA to ignore the potential of urban agriculture as a way of reducing human vulnerability in cities. The DOA could potentially play a significant role in poverty alleviation and reducing human vulnerabilities in Cape Town by supporting food gardens within the city. In the City of Cape Town there are already organisations who promote the development of food gardens.

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One such organisation, Abalimi Bezekhaya, which has been active in urban agriculture for more than 14 years, helps individuals to develop organic food gardens to supplement their diet and provide additional income. (Abalimi Bezekhaya, n.d.) DOA's budget could give financial support and training to these kinds of organisations country wide. Research could also be done into the possibility of extending the activities of these organisations to small scale aquaculture and animal production activities, space permitting.

D. Conclusion

In this chapter, I have demonstrated that adopting an adaptive management approach to national budgetary procedures could have radical long term consequences for the structure and functioning of individual departments. It might even lead to the development of new departments as is suggested in the proposed Department of Sustainable Development and the proposed Department of Tourism. It most certainly would require that all three departments developed some way of evaluating their performance using sustainability criteria. I suggested the need to have a programme in each of them that specifically focused on monitoring the Annual Report performance indicators and their relationship to sustainability indicators. I proposed that the monitoring programme in each department should report back to the proposed Department of Sustainable Development and the proposed Standing Committee on Sustainable Development that could monitor the progress of these sustainability

indicators.

Specifically in the Department of Environmental Affairs and Tourism (DEAT), I interpreted adaptive management to reveal the need to focus more specifically on the protection of the environment. I argued that in 2005 the main revenue focus of the department was on social upliftment and tourism. This was said to be short-sighted because DEAT was the only department that was mandated specifically to look after the more subjective intrinsic concerns of the environment, like biodiversity and national parks.

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The fact that it spent most of its funds on other activities meant that its mandate was being diluted. DEAT needed to focus its activities on biodiversity management, coastal and marine management and environmental quality.

In the case of the DTI, the major new focus that I interpreted adaptive management to suggest was the need for increased awareness raising and training within the department itself and in each of their programmes. All programmes within the department needed to be monitored for environmental, social and institutional impacts through the creation of sustainability indicators directly related to their activities. Incentives, in the form of taxes and subsidies for green enterprises, needed to be investigated. DTI's large budget and extensive investment in large scale programmes meant that this department could have a potentially significant impact in ensuring that environmental concerns were taken seriously in economic decision-making both locally, in the rest of Africa and other countries trading with South Africa.

DOA was the department that was most geared to accommodating the insights of adaptive management in that it already had a monitoring and evaluation arm that focused on the sustainable use of resources. I suggested that these functions would be better coordinated in one department and that they should be monitored by the proposed Department of Sustainable Development and the proposed Standing Committee on Sustainable Development. I also suggested there was a need to make

DOA's Sustainable Management of Resources and Use Sub-programme the top expenditure priority. Finally, I proposed the broadening of the DOA's mandate to include urban agriculture.

Despite the radical nature of some of these suggestions, they are not the only interpretations that could be gleaned from the Cape Town Sustainability Report and the 2020 vision of the Integrated Development Plan of 2004/5. They are one among many possible interpretations of the sustainability indicators that I have selected. Adaptive management is not prescriptive about outcomes. Instead, it seeks to create processes that allow for constant re-interpretation.

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In the final chapter, I will draw on my interpretations of the insights of adaptive management in the departmental votes as well as the budget process, to show how effective environmental pragmatism is at including environmental concerns into economic decision-making. Moreover, I will discuss how this thesis has demonstrated environmental pragmatism's ability to move ecological economics beyond its limited focus on use values in economic decision-making. Finally, I will discuss the impact of adaptive management on the debate in environmental ethics between intrinsic value theory and utilitarian environmental values.

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CHAPTER FIVE: THE CONTRIBUTION OF ENVIRONMENTAL PRAGMATISM TO DEVELOPING AN ENVIRONMENTAL ETHIC FOR ECONOMIC DECISIONMAKING

A. Introduction

In this final chapter, I discuss the contribution of environmental pragmatism to developing an environmental ethic that could guide economic decision-making in a specific case study, the South African National Budget of 2005. I demonstrate this by showing how adaptive management's guidelines of localism, multi-scalar analysis and

experimentalism are able to make concrete suggestions about how the budget process needs to be changed to become more responsive to local issues, future generations and non-human species. This is made even more specific, with the help of local and national sustainability indicators derived from the City of Cape Town's Sustainability Report and the 2020 vision of the City of Cape Town's Integrated Development Plan of 2004/5. These indicators and goals were helpful in that they guided the suggestions I made about the programme content and prioritization of expenditure in the DEAT, DTI and DOA budgets.

Secondly, this chapter focuses on the contribution of environmental pragmatism towards developing more sustainable economic decision-making in general. In this section of the chapter, I discuss how environmental pragmatism, as a form of moral pluralism, is able to move beyond the reductionism of ecological economics, i.e. the reduction of all valuation of the environment to monetary terms. I show how adaptive management's guidelines of localism, multi-scalar analysis and experimentalism create opportunities within economic decision-making to encourage a plurality of values to emerge within a context. I illustrate how despite the diversity of values, the prioritisation of environmental values is possible and justifiable within economic decision-making.

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The third level of analysis widens the focus even further by assessing how successful environmental pragmatism is at addressing the philosophical distinction between utilitarian and intrinsic environmental values. I discuss how environmental pragmatism is able to dissolve the ontological distinction between utilitarian and intrinsic values while making an argument for retaining the distinction between the two.

Norton's

understanding of environmental pragmatism achieves this by developing a methodology that is able to bring utilitarian use values and intrinsic values into conversation with one another within particular contexts.

B. The contribution of environmental pragmatism to a sustainable South African national budget process

My reading of Norton's ethical guidelines of localism, multi-scalar analysis and experimentalism suggested a number of major changes to the budget process, in order for it to accommodate contextualized longer term values in an open-ended experimental way.

I suggested that four new bodies be created to facilitate the sustainable development of the South African national budget. They included:

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A proposed Department of Sustainable Development dedicated to the monitoring of sustainable development in the national as well as local government;

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A proposed Environmental Commission, constructed along the same lines as the Human Rights Commission, that included respected research institutions and representatives from civil society organizations involved with environmental protection;

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A proposed Standing Committee on Sustainable Development that monitored the environmental, social and economic impact of all programmes in government with the help of local and national indicators formulated through consultative processes with local municipalities;

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A proposed Environmental Cabinet Cluster tasked with ensuring the effective intergovernmental implementation of government policy on environmental matters with the help of locally generated and nationally aggregated sustainability indicators;

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An Environmental Directors-General Cluster that reported to the national cabinet.

This group of government employee representatives from all departments of government would work together to ensure co-operation on environmental matters throughout government;

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Local municipal environmental advisory committees that are linked to municipalities and that monitor local sustainability reports. Their inputs would also be included in the development of municipal integrated development plans.

There are many reasons for suggesting these additional bodies. Firstly, they will assist with the monitoring and adjustment of the government's locally generated and nationally regulated development path. They will also help with collecting the data on departmental programme successes, failures and environmental impacts and in interpreting how these programmes could be improved. Their joint duties will enable the moulding of South Africa's development path.

Secondly, one of the key aspects of environmental pragmatism's pluralist philosophy is creating spaces within economic decision-making to allow for discussion and prioritization of the different ways the environment is valued in a given context. This process is vital to the development of environmental values within economic decisionmaking. These five bodies would create platforms within and outside the budget process to do that. At present, the environment is largely treated as an externality in the budget, something that can be relegated to one department. These additional bodies will go a long way to making environmental concerns central to the budget process and each department's finalization of their budget priorities. Moreover, these bodies will also contribute to making the budget process less of a closed process driven by a select group of technical experts and politicians to a more open process where the norms and values being used to drive expenditure decisions are made explicit.

At an institutional level this also means that a different style of governance would be required. In order for government programmes to adapt to changing social, economic, institutional and environmental challenges they can no longer operate as isolated units, making use of their own specialized tools of analysis, technical jargon and consultants that are inaccessible to other departments and disciplines. A multi-disciplinary, interdepartmental approach is required to address the prioritizing of sustainability indicators. This kind of approach has already some support in the intergovernmental system with the development of cabinet and directors-general clusters to address interdepartmental issues. An environmental cluster that was able to discuss any interdepartmental issue related to the environment would be one way of introducing this new style of interdepartmental governance.

Extensive data and information gathering systems would need to be included in the budget process to allow the above-mentioned bodies to have informed discussions. These could exist on three levels:

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A programme performance monitoring level within each department to check if they are meeting the targets they have set for themselves. This is already happening in the writing up of the Annual Report in departments;

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A sustainability monitoring programme within each department focused on the collecting and interpreting of relevant local sustainability indicators and evaluating them with departmental performance indicators. This would be a form of self-auditing by the department to see if their programmes were impacting, either negatively or positively, on the long term sustainable development of the South African economy;

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A second level sustainability monitoring process managed by the proposed

Department of Sustainable Development. They would provide monitoring and evaluation assistance to departments on the relationship between local and national performance targets and local and national social, environmental, economic and institutional sustainability indicators. They would also be able to provide a broader interdepartmental perspective on sustainability indicators;

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A third level sustainability reporting process whereby the proposed Standing Committee on Sustainable Development called individual departments to account on their sustainability performance in Parliament and also reported on their success stories and achievements.

The above-mentioned monitoring levels would need the following data to be able to function effectively:

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Local and national departmental performance indicators that are set by the departments within local and national government to perform their mandate;

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Local and national sustainability indicators that are set by bodies moulding the country's development path. These committees would be the previously mentioned, proposed local municipal Environmental Advisory Committees, the proposed Department for Sustainable Development, and the proposed Parliamentary Standing Committee on Sustainable Development. The proposed Environmental Commission would provide input in Parliament on these sustainability indicators;

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Local and national sustainability reports that are commissioned by the proposed Department of Sustainable Development every five years. They could be monitored and revised by the local municipal environmental advisory

committees on a local level and at a national level by the proposed Standing Committee on Sustainable Development to ensure compliance. These local and national sustainability reports would provide an external benchmark against which government departments could measure their progress.

The need for such extensive information and feedback in government programmes and budget processes ties in with environmental pragmatism's reliance on experiential learning to achieve its aims. Truth claims in environmental pragmatism are tested through experience, that is, if experience shows them to be inadequate then new ways are sought to either improve them, or they are discarded. In chapter two, I discussed how environmental values are subject to the same scrutiny and too can be modified or discarded if they no longer make sense of reality to human beings in a given context.

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With the help of the above-mentioned additional bodies and information systems, the monitoring and evaluation of environmental, social, institutional and economic conditions within South Africa now becomes an integral part of the budgetary process. The ideal situation is for every budgetary department at national and local level to have mandated performance targets within their programmes as well as sustainability indicators that have been set with the aforementioned budgetary bodies to ensure the longer term sustainable development of their programmes. Each department would also need to be furnished with a monitoring and evaluation function to ensure that this was achieved.

The costs of this process, both in terms of time spent and resources or expenditure allocated, is anticipated to be considerable. However, without this kind of information it would be impossible to ascertain if programmes were contributing to sustainable development of the economy or not. In a sense, without any form of monitoring or evaluation of the impacts of programmes, one is managing environmental and other

resources through guesswork, political authority or expert opinion, not through experiential learning.

The use of sustainability indicators within the budget process reinforces the idea that the economic system is dependent on the existence of environmental, social and institutional opportunities and challenges. No longer can the environment, specifically, be seen as something that should be taken into consideration after an economic decision is made but rather it is integral to the making of economic decisions. Every department in government both locally and nationally, would in this approach be obliged to demonstrate in their Annual Reports to what extent they had contributed towards sustainable development. It is no longer sufficient just to carry out the departmental mandate; one would also be required to do so in a fashion that is sustainable over the longer term. This would mean, for example, in DTI that it would not be good enough to increase manufacturing through targeted investment or subsidized programmes in the economy, they would also have to do so in a manner that was environmentally sustainable.

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However, perhaps the biggest change in the budget process that an adaptive management ethic could facilitate is over the long term. For revenue collection and expenditure to be sufficiently responsive to the local needs, it must be delegated where possible to local government with national government performing only those functions that cannot be performed by local government. However, this might not always be possible given the inability of some local governments to manage their own affairs. It is thus suggested devolution of powers should take place slowly and at different paces, depending on the capacity of individual local municipalities to perform such functions. Moreover, there will be some functions which are simply not feasible or advisable for local government to manage. Among these functions are national defence, foreign affairs and education. In these cases, the current budget process should ensure that sufficient and accurate local information is available to those who are allocating revenue for

these functions. This could be made available through local sustainability indicators.

The devolution of budgetary power ties in with environmental pragmatism's focus on the context of decision-making being vital to successful economic decision-making. At present, national budgetary decisions affecting local government are context-less, in the sense that they are made without a direct sensitivity to the factual particularities of a place or the local values within an economic decision-making context. Local government is represented in the budgetary process through the Budget Forum (Hickey and Van Zyl, 2002: 46, 47) but it is only required to convene once a year and those representing local government on the body are representing local government as an institution. They are not representing particular geographical areas or specific institutional decision-making contexts.

C. The contribution of environmental pragmatism to sustainable departmental planning in SA Budget 2005

In this section, I discuss what kind of changes adaptive management's guidelines of experimentalism, localism and multi-scalar analysis could make in the individual departmental votes. It must be stressed that these are only some of the changes that an
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adaptive management approach might suggest, there could be many more that greatly vary from these suggestions. Environmental pragmatism would expect this kind of diversity. This is because environmental pragmatism does not look for one true answer but rather acknowledges that there could be any number of development paths that emanate from the three above-mentioned guidelines, depending on the physical, social and institutional context in which they are discussed. I will start off with DEAT in which major changes were suggested. They included that:

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DEAT should not dilute its mandate with other priorities. Tourism should be a separate department. Its main priority should be the environment.

DEAT needs to focus its activities on Biodiversity Management, Coastal and Marine Management and Environmental Quality;

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A proposed Department of Sustainable Development with a monitoring function as well as an environmental protection and prosecution agency should be created;

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A proposed Standing Committee for Sustainable Development should be created;

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DEAT needs to expand its budget to more than double its current figure;

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DEAT needs to develop a monitoring and evaluation arm that is linked to local and national sustainability reports and that feeds information back into the proposed Department of Sustainable Development.

The DTI was the department with the least knowledge about the impact of their programme activities on the environment. However, in terms of the other sustainability indicators raised by The City of Cape Town's Sustainability Report, they were on target. They focused specifically on job creation and black economic empowerment in their programmes and addressed sustainability indicators concerned with income disparity, equity and empowerment in many of their programmes. However, the department had not yet begun to contemplate the impact that its activities had on longer term environmental concerns. It is against this background that the following suggestions were made:

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DTI should begin researching the environmental impact of its activities in each of its seven programmes and look at possible incentives for developing new

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environmentally beneficial production processes and develop performance indicators that match locally generated national sustainability indicators;

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DTI should achieve the above by developing a proposed Sustainability Monitoring and Evaluation Programme within its department that monitors and evaluates how all its programmes affect the environment;

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DTI should focus extensively on environmental training and awareness raising within the department.

The DOA has in place many of the key functions that adaptive management desires in government departments to achieve future orientated, locally-based, de-regionalised programmes. They already have programmes that focus on the sustainable management of resources, a data collection and interpretation programme and a monitoring and evaluation programme. However, greater efficiency could be achieved by:

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Combining three programmes, i.e., Sustainable Resources Management and Use; Economic Research and Analysis, and Programme Planning, Monitoring and Evaluation into one programme as three functions so that their activities are better co-ordinated;

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Significantly increase expenditure in the Sustainable Resources Management and Use fund so as to address the impacts of agriculture on South Africa's deteriorating ecosystems as well as ways of adapting agriculture to cope with changing environmental circumstances;

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Broadening of the mandate of the DOA to include extending agriculture to urban areas. It is an oversight on the part of the DOA to ignore the potential of urban

agriculture as a way of reducing human vulnerability in cities.

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D. The contribution of environmental pragmatism to sustainable economic decisionmaking

I ended the first chapter on ecological economics with the conclusion that it was unable to offer an ethical approach that would be able to include longer-term non-monetary values in economic decision-making in the environment. This is not to say that it had not made a significant contribution. Ecological economics has helped to place economic decision-making within an ecological context and in so doing shown up the real impacts of economic decision-making in the environment. It has moved economic concerns beyond the interests of the consumers to those who are not necessarily players in the current market economy, that is, the poor and future generations.

This outward shift in addressing environmental concerns means that the environment has moved from being considered an externality, as it is in neo-classical economics, towards a potentially more central focus in the economic decision-making process. This also means that economics becomes concerned about the distribution of economic resources, ecosystem limits and the uncertainty and complexity of environmental decision-making. However, my conclusion in chapter one was that ecological economics, despite its potential, remains ultimately trapped in a kind of reductionism. This is because, although it contextualized economic decision-making, when it needed to prioritise environmental values it ended up assessing them on a short-term monetary evaluation scale.

In this thesis, I regard the South African National Budget as a powerful economic decision-making tool of ecological economics. I consider it a tool of ecological economics because it intervenes in the market place, among other things addressing inequalities and externalities. In the case of the DTI, the focus is on addressing Black Economic Empowerment and in DOA and DEAT, both Black Economic Empowerment and environmental externalities are addressed. The South African

National Budget

therefore represents an attempt to contextualize the market mechanism, placing it within an environmental and social context and making it accountable.

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However, South Africa's National State of the Environment of 2006 (South Africa. DEAT, 2006b) shows that it has not been able to significantly stem the increasing deterioration of natural resources in South Africa.

In my analysis of the budget, I show how environmental issues are essentially devalued. They are devalued in terms of financial priority in the budget, in that DEAT's budgetary allocation is one of the smaller budget allocations. Secondly, within the department itself environmental protection and biodiversity are only ranked third, with tourism and job creation being the main financial thrust of the budget. Thirdly, although all the different departments in the budget could not function without the environment, very few of their programmes are monitored for environmental impact. I showed how the DEAT and the DOA had not comprehensively analysed the impact that their programmes had on the environment, while the DTI had not even considered it. The overall picture this creates about budgetary decision-making and the environment is that, although the environment is considered, it is not central to the economic decision-making process but remains an externality.

In chapter two, I discussed how this stems from the reliance of ecological economics on cost-benefit analysis to incorporate environmental values into decision-making. Although the cost benefit analysis in ecological economics extends beyond the desires of those members of current generation who are privileged enough to be players in the market economy and also includes broader social concerns like job creation for poorer communities, it still amounts to reductionism. When ecological economics attempts to contextualise the market system by placing it in an ecological and social context it moves towards a multiple value context. However, it does so by still relying on moral monism, a

moral theory that is characterized by a reduction of all values to a single principle or point of reference.

Environmental pragmatism, a form of moral pluralism, provides ecological economics with a way out of this conundrum. It does so by examining in detail the context in which environmental decision-making is taking place. However, this does not restrict one to
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present circumstances but incorporates how circumstances change over medium to long time periods. It also allows for constant revision and adjustment towards the particularities within the local context, so as to allow for adaptation. Norton's adaptive management develops conceptual tools for contextualising exchange values amidst other forms of valuing. They are: experimentalism, localism and multi-scalar analysis. (Norton, 2005: 92, 93)

Localism means that budgetary decisions need to be as area sensitive as possible. In the context of the South African National Budget this means that budgetary spending needs to be devolved as far as possible to local government where local issues are best heard and decision-making is put in the hands of the affected community. Multi-scalar analysis means that micro decisions needs to be taken mindful of the macro impact that these smaller choices have cumulatively for current generations as well as for the likely cumulative impact on future generations. Experimentalism means including more information through locally generated sustainability indicators so that the facts and values could be adjusted to suit changing environments and local contexts.

Introducing multi-scalar experiential learning into economic decision-making within a context means allowing use values within the market mechanism to be influenced by social and environmental values and facts. Individuals within the market place already adjust their supply or demand according to the demand and supply of other products respectively. However, when use values in the market are put in a social context where certain aesthetic, religious or intrinsic values enjoy higher

priority then use values can be modified or changed to better reflect the ideals of society.

It is generally true that economic values are predominantly short-term and environmental values are of a longer time frame. However, these short term economic values and longer term environmental values are inextricably linked to each other, especially over longer term periods. Norton's adaptive management is able to explain how they are linked, and how to influence them favourably. Short-term economic needs are linked to longer term environmental concerns through a hierarchical relationship that recognizes that what

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happens accumulatively on one level has an effect on the level immediately above it. Therefore, a series of short-term economic choices that results in the creation of an industry that generates a large amount of pollution will, for example, have an impact on long term sense of place values in a given area, as well as ecosystem concerns.

In order to avoid unwanted accumulative environmental consequences this approach sketched above, that Norton refers to as adaptive management, suggests the creation of management processes that have the concepts of experimentalism, multi-scalar analysis and localism incorporated in them. This is expected to allow for the construction of development paths that represent the manifestation of certain values and desirable economic, social, environmental and institutional consequences. Adaptive management means that economic decision-making can no longer be taken in isolation from other immediate social, environmental, institutional concerns, nor can it be taken in isolation of the longer term values of the same. In order to achieve this, adaptive management seeks out social learning spaces within institutions influencing economic decision-making so that short-term environmental values can be influenced by longer term values.

The spaces for social learning created by Norton's adaptive management within economic decision-making also allows for the possibility of new technologies to develop

within the economy. When economic decision-making no longer takes place in isolation from environmental and social values, then it is highly likely that positive technologies and production processes that add value to the social and environmental context will emerge as developers seek to work within the social and environmental values of a particular place.

The current approach of ecological economics to pricing aspects of the environment can create anomalies where prices are placed on attributes of the environment that are irreplaceable. An example of this might be the decision to cost the value of a domestic pet to a single octogenarian with no living relatives. This would be tantamount to placing a monetary value on a family member. Similarly, the decision to cost the value of the future existence of the cheetah, an already endangered specie, also seems morally

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inappropriate, in the sense that it calls into question whether we as human beings should be allowed to determine which species are allowed to continue living in the world. By converting all environmental values into monetary values, it trivializes environmental values making them equal to normal everyday utility calculations when, in fact, they entail deeper existential values.

However, values within a context also influence one another. What people see as priceless or sacred would influence what we would be willing to exchange in the market place. Values are themselves contextualized in this interaction. The decision to only focus on the exchange value of items that are priceless or sacred can also be an act of misvaluation. This is because it is the very nature of these objects or relationships that they are priceless or sacred that they cannot be exchanged. Any act of exchanging them would mean that they could actually be substituted or replaced by something else.

Many intrinsic value theorists would argue that there are certain aspects of nature that have this characteristic and therefore should not be exchanged or priced. Environmental pragmatists would avoid this kind of categorical decision about

objects or relationships in the environment. They would prefer to state that within certain contexts some people might see aspects of the environment or relationships within the environment as nonexchangeable. In other contexts or times in history that same way of valuing those objects or relationships might not be relevant. Norton's environmental pragmatist ethic approaches the market mechanism within a particular social, environmental and institutional situation, forcing it to see exchange value in relationship with other values operating at a particular point in time and over time.

There are numerous opportunities or contexts for multi-scalar experiential learning in economic decision-making. The national budget is potentially a very powerful public sector context through which experiential learning could influence use-values in the market place.

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It is a value-driven conversation between different levels of government, about how the country should spend the revenue collected from its citizens. (Hickey and Van Zyl, 2002: 2) When these roleplayers allocate expenditure they are prioritizing certain values above others and thereby influencing the parameters within which the market operates.

In this thesis, I looked at possible ways of including the three guiding principles of Norton's adaptive management approach (experimentalism, multi-scalar analysis and localism) into the budget so as to make space for multi-scalar experiential learning. In order for these guidelines to be followed, several aspects of the national budgeting process needs to be changed. Firstly, it needs over time to devolve sections of the budgeting process to local authorities so that local values and local environmental, social and economic facts could be taken into consideration when prioritizing spending. Secondly, the national budgeting process needs to become far more information intensive, with performance indicators available for every programme as well as sustainability indicators to show how, if at all, government interventions impacted on

long term environmental, social and economic concerns. Thirdly, the budgeting process needs to open itself up to longer and more intense parliamentary and local advisory committee scrutiny so as to allow for the constructing of new environmental, social and economic truths, following the experiential learning produced by the information rich indicator process.

Another platform for influencing the budgetary process and ensuring that it would be more exposed to non-use values would be through the management of government departments and their respective mandates. The core business of government departments and their interaction with the private sector result in significant impacts on the environment, the economy and society. I propose that if one were to implement the concepts of multi-scalar analysis, experimentalism and localism in their management process, this too would have a significant influence on economic decision-making within South Africa.

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When economic decision-making is extended not only in terms of context, i.e. from the market to the whole of society including non-market players, but also in terms of time, from this year to 500 years, the kind of decisions that are made take on a different shape. Add to this the fact that the process is open-ended and information intensive so that one can learn from failures, then what you essentially have, as described by Norton, are adaptive management development paths, rather than ad-hoc decision-making. These development paths are measured by environmental, social and economic indicators which monitor certain key statistics or data.

In this thesis, I linked local indicators within The City of Cape Town's Sustainability Report of 2005 to programmes within the budget process of The South African National Budget of 2005. These indicators represent some of the possible road-markings for the development path that the South African National Budget of 2005 could have prioritized. The proposed Standing Committee for Sustainable Development and the

proposed

Department of Sustainable Development with its enforcement directorate or agency would be the custodians of this development path and they would assist in formulating the prioritization of these indicators and using them as a way of monitoring the activities of all the departments.

Norton's adaptive management could also be applied to Environmental Impact

Assessments (EIAs), a process that also involves the incorporation of environmental values in economic development processes. Much to the anger of many environmental activists, EIAs often lead to the go-ahead on development at the long term expense of the environment. This is because, once all the values have been taken into consideration, instead of a pluralist, open-ended pragmatist process being followed, a cost-benefit analysis is completed which measures costs in terms of monetary value at today's market prices against today's benefits for the developer and the surrounding community.

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While this often leads to jobs for locals in the short-term and some mitigating measures towards the environment, it also often results in a significant long-term loss in biodiversity, wilderness or open space for future generations and other species. Hence the cry from environmentalists that is substantiated by South Africa's National State of the Environment Report of 2006, that South Africa is destroying its natural heritage.

The approach of an environmental pragmatist ethic to development in local authorities

would be a useful way of ensuring that Environmental Impact Assessments were not conducted in a manner which favoured short term costs and benefits for present generations. It would require, however, a number of changes in the decision-making processes of local government. What is required is setting up processes within their decision-making bodies that are information intensive, multi-scalar and experimental so that environmental considerations could become central to their decision-making, rather

than mere externalities that required some form of mitigation. Local authorities would need to ensure that they set up development paths which are in turn monitored by appropriate indicators, and this would guide their decision-making for or against development proposals. This would go a long way to addressing the current ad-hoc and sprawling development that takes place in many local authorities that are driven by the need for short term revenue.

What I have attempted to demonstrate in this thesis, through the analysis of the South African National Budget of 2005, is the ability of environmental pragmatism as an ethic to make environmental considerations a central part of economic decision-making. Essentially environmental pragmatism relies on democratic institutional mechanisms to achieve its ends. It requires the setting up of social learning spaces within institutions through the use of guidelines for localism, multi-scalar analysis and experimentalism. These institutional guidelines are a way of contextualizing economic decision-making without doing away with the market mechanism or the satisfaction of consumer demands.

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Environmental pragmatism as an environmental ethic does not call for the eradication of the market mechanism. It just recognizes, as Sagoff (2004: 99) does, that all price gives us is the exchange value of an object and that not all environmental goods can be exchanged or can be priced.

E. The contribution of environmental pragmatism to resolving the debate between intrinsic and utilitarian values in environmental ethics

In the first chapter of this thesis, I make the point that this is first and foremost a philosophical thesis, the purpose of which is to demonstrate the value of environmental pragmatism for economic decision-making. Why then, one may ask, have I devoted half the thesis to a case study like the South African national budget that looks like it falls within the field of public management or policy studies. I analysed the national budget, a

potential ecological economic tool, to show what environmental pragmatism could do both critically and constructively to address the inability of ecological economics to address environmental concerns effectively. In order to do this, I needed to conduct a detailed case study and show what tangible changes might result in a budget from this new approach. I asked how it would in practice result in economic decisions that were less harmful to the environment. In showing these tangible changes, I demonstrated how Norton's methodology with its central guidelines of experimentalism, localism and multiscalar analysis, could facilitate a process that was able to address the full range of environmental values within economic decision-making.

In the conclusion of the first chapter, I argued from a theoretical point of view that moral pluralism in the form of environmental pragmatism as discussed by Norton offers us the best possible way of valuing the environment within economic decision-making. I argued this because it offers us a way of including immediate individual consumer preferences (the subject matter of neo-classical environmental economics), the longer-term ecosystem valuations (the subject matter of ecological economics) as well as the nonanthropocentric values (the subject matter of intrinsic value theory) without falling back on a priori, foundational arguments that insist that certain aspects of the non-human

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world have inalienable value. Intrinsic value's ontological move requires a top-down approach where an environmental ethic or set of moral guidelines is imposed on a situation by experts in environmental ethics, or those "in the know".

Environmental pragmatism, though sympathetic to the need to valuing the natural world for its own use, advocates only the use of democratic, bottom-up procedures to arrive at an environmental ethic so that people identify with the environmental values expressed, largely because they are aware of it being a construction of their own.

More importantly, although environmental pragmatism does not dissolve the distinction between use-values and intrinsic values in environmental ethics

entirely, it removes its ontological significance. To our knowledge, the act of valuing remains an entirely human activity. The act of valuing is in itself performing some kind of use for human beings and so strictly speaking all human values are use values. However, it does not necessarily mean that humans need be the only objects of value. Humans are able to value aspects of the environment, if not the whole of the environment, for itself. Norton's adaptive management shows how all values are essentially contextually constructed. We might value an estuary ecosystem because it provides for our very most basic needs, water, but we may also value it for its aesthetic appeal or its historical meaning. Similarly, cows might be valued as a source of protein but also for their religious significance. Placing the concept of intrinsic value on objects to prevent their being used by humans could be a choice made by a community of humans, but it has no ontological significance.

The rejection of the notion of objective intrinsic value (as discussed in Chapter 2), has some significance in environmental evaluation. This is because an argument could be made that one of the reasons why environmental ethicists developed the concept of intrinsic value was because the use value of the market mechanism was destroying other environmental values that people held dear. (Norton, 2005: 164) If the environment simply had a basic resource value, we would hypothetically have no interest in whether the Kruger Park was transformed into a drive-through zoo or remained a wilderness. But

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most of us do, and therefore the question becomes: how do we keep non-use values alive in economic decision-making? How can we prevent someone writing out a cheque to transform the Kruger National Park into a drive-through zoo?

Intrinsic values are just another kind of valuing in that something is valued more for its existence rather than for any direct use. Norton takes pains to point out that intrinsic value is not something that belongs to the object itself, it is rather seen in relation to

human beings. (Norton, 2005: 187) This shifts the objective of environmental ethics from trying to establish if an object or ecosystem possesses intrinsic worth to providing justifiable reasons why nature should be valued in a specific way in a specific context. (Light, 2003: 234) In this way, it is possible to include both use values and intrinsic values as reasons for choosing a certain development path over another.

The notion of objective intrinsic value can be used to provide a metaphysical justification for why some moral objects in nature should be "untouchable" and should not be able to be exchanged in the market place. However, environmental pragmatism is not in favour of attempting to give aspects of the natural world some kind of special significance or status outside of human evaluation. Environmental pragmatists are of the opinion that while humanity is doomed to create metaphysical assumptions and theories about reality, these cannot be given any special status, outside of them being our understanding of reality within a certain context at a point in time. Put differently, all evaluations of the natural world are human constructions and are influenced by the context and era from which they have emerged. Environmental pragmatism asserts that specific intrinsic value theories and economic valuations of the environment, if they are set up as the only way of valuing the environment, amount to a form of reductionism that is an oversimplification of reality.

However, it is important to separate Norton's refusal to support objective intrinsic worth with the inability to formulate a temporal understanding of intrinsic worth in a particular time and place. Wilderness areas, biospheres and ecosystems could all be ascribed subjective intrinsic worth by being protected by legislation. This legislation in a sense

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ascribes subjective intrinsic worth to the natural world as it is perceived by the society at that point in time. It is a form of context bound subjective intrinsic worth in the sense that it is focused on maintaining the integrity of the wilderness state rather than meeting the

immediate needs of human beings. It is true that this is still addressing a need of human beings. However, this need is distinct from food and shelter and more focused on spiritual or sense of place needs. One could describe these human needs as ranging from entirely human-centred to being other directed.

Policies, approaches and ways of behaving towards nature reflect somewhere on this scale. They remain anthropogenic in that it is always human beings doing the valuing, but they are either more focused on meeting immediate human needs or more focused on understanding, nurturing or appreciating nature and human beings' connectedness with it. It is this connectedness that ecological economics attempts to recreate but is unable, to because it remains too closely aligned to the market mechanism. By focusing largely on serving the basic needs of human beings, other needs like the sense of belonging, spiritual significance and sociological aspects of our physical environment are discarded and one is left with an impoverished approach to the environment.

Environmental pragmatism, by acknowledging the creative, constructed dimension of our involvement with the natural world, allows for inspirational as well as basic needs to be recognised. It does not attempt to establish these inspirational aspects as more important or less than the needs for food and shelter, but rather assesses them contextually. The guideline of multi-scalar analysis allows them to interact within different time scales, showing how they are connected or disconnected. Experimentalism allows for adaptation of these values to fit the new multi-scalar perspective and localism creates the timebound context in which these values play out. These interactions, in adaptive management, allow for a variety of possible integrated development paths that are created as a result of a process guided by experimentalism, localism and multi-scalar analysis.

Norton (2005: 132–140) speaks about the wickedness of environmental problems, that there are often a plurality of values at play in an environmental dilemma that do not lend
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themselves to a simple analysis of either use values or intrinsic

value. If we do a costbenefit analysis of the monetary value of South Africa's aforementioned Kruger Park, while the sum of money may be astronomical, any attempt to do this would be reductionist in that it is impossible to place a monetary value on an experience of wilderness, or a sense of place. Norton's adaptive management seeks to move beyond reductionism by essentially shifting the focus of environmental ethics from what should be regarded as intrinsic and what should not, to looking at the multiple ways in which we do value the environment in a given context. The result is an inclusive approach, the direct opposite of reductionism. It is a process whereby more and more ways of valuing the environment in a given context are exposed and discussed.

It was one of my criticisms of environmental economics that it was not able to capture all of the ways in which people value the environment because of the centrality of the market mechanism in its decision-making process. By placing the market at the centre of economic decision-making, only environmental concerns that reflected the interests of paying consumers were being addressed. Ecological economics goes significantly beyond the consumer and places the market mechanism within ever widening social and environmental contexts. However, when it needs to tally up and make a decision, it equates them all on the same monetary scale that is gleaned from market-related prices that are determined by the short-term interests of consumers. This is a form of reductionism. Norton's adaptive management seeks to keep the diversity of values at play and therefore replaces the market mechanism at the heart of institutionalized economic decision-making with revisable development paths that are locally inspired, future directed and experimentally maintained. By placing revisable development paths at the centre of institutionalised economic decision-making one moves away from whimsical, ad hoc economic decisions made in the market place that are out of context and often ecologically detrimental.

Norton's adaptive management with its guidelines of experimentalism, localism and multi-scalar analysis guides the process whereby the variety of values within a context

are made explicit and through which development paths can be created. Localism means
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that all the ways in which local people in a given environment perceive and interact with the environment need to be taken into consideration. Multi-scalar analysis means that the values and physical realities are looked at not only as interacting on one level or during one time but over generations and on macro scales. Experimentalism as a guideline also creates a potential avenue through which intrinsic values could surface within expenditure decisions in the national budget. In a purely utilitarian approach priorities are weighed according to short term cost/benefit analysis. An estimate is made of the foreseeable costs and benefits and those decisions that are projected to bring the least costs and highest benefits are chosen. Within an adaptive management approach, a different course of action would be followed.

Firstly, localism is useful in describing the decision-making framework. All the implicit values and factual considerations are brought to light through its focus on the context. Secondly, multi-scalar helps to describe these values and facts both in the short term and longer term. Then, thirdly after this broadening and deepening of the decision-making context has been completed, decision-makers attempt to reduce uncertainty through experimentation. This introduces a degree of open-endedness into the process which allows for alternative forms of valuing to emerge and older or inappropriate forms of valuing to be broken down. This acknowledgement of the very constructed nature of the interaction of human beings with the natural world allows for increased responsiveness to changing physical contexts as well as changing values. There is a greater likelihood, in this kind of process, of intrinsic values being able to influence utilitarian values and vice versa. This interplay of values could, for example, lead to very different production processes in industry as it becomes more sensitive to people's sense of place values. It might even lead to a decision not to go ahead with a development at all, or alternatively, to completely alter a management style or procedure so that it is

beneficial to the local environment.

The breadth and depth of this interpretation of context means that there are many values and desirable social, economic, environmental and institutional states of affairs that could be pursued at any one point in time. The creation of development paths or plans of action
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represent the prioritization of this multitude of values. If, for example, the value of wetlands is a priority, then the protection of these endangered water bodies will be reflected in the amount of expenditure allocated to preserving them in the budget.

Norton's third guiding principle of experimentalism creates a way of negotiating oneself around these values and development paths, adapting and changing values and corresponding development paths or plans of action as economic, social and environmental states of affairs change.

This is not to say that one does away with the market mechanism within economic decision-making, and it does not mean that short-term market values or interests are not considered or not useful. They are often the first points of entry within economic decision-making. However, under Norton's guidelines of experimentalism, localism and multi-scalar analysis they are considered within the larger time frames and bigger development paths and are themselves open to revision. Environmental pragmatism creates spaces in institutionalized economic decision-making like national budgets or environmental impact assessments to allow for a plurality of values, that is, both marketdriven and longer-term ecosystem values, to interact with one another in a decisionmaking context.

In my analysis of the South African National Budget of 2005 I showed the implications of taking these guidelines seriously. It did not amount to a planned economy where the authority lay in a centralised state or the overburdening of all economic decisions with lengthy committee meetings. Rather environmental pragmatism advocates seek as many opportunities as possible within economic decision-making to ensure that the most

extensive range of values as possible are discussed. In fact, it advocates a decentralization of authority, openness to correction through experience and a bid to consider the implications of decisions over longer time periods. This allows space for aesthetic, religious and sense of place values that could not be appreciated in a short-term economic decision-making context were the individual consumer, company, developer or city council's immediate needs were taken as the main point of reference. However, it does not give intrinsic value claims the ability to categorically stop all development. Intrinsic

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value claims cannot be used as red flags in economic decision-making; they too are up for discussion and revision and too could be discarded. There is no guarantee that they will not be considered inappropriate by the community in a given context.

When the centre of the economic decision-making process is a community driven, future generation orientated, adaptive vision, neither monetary evaluation nor intrinsic value claims necessarily have the final say. In this kind of economic decision-making it is the community interaction that has the final say. The emphasis is on the process of value formation. In the case of the national budget, it would be the proposed local municipal Environmental Advisory Committees, the proposed Environmental Commission, the proposed Standing Committee on Sustainable Development, the proposed Department of Sustainable Development, the proposed Environmental Cabinet Cluster and the proposed Directors-General Cluster that would be active in the discussion, revision and formation of values informing the chosen development path at that point in time. In the case of environmental impact assessments this would happen in the public participation processes.

Previously, I showed how DEAT, although it was the department in the national budget that could be most expected to protect the intrinsic value of nature, did not prioritise existence or intrinsic values. Most of the budget was focused on utilitarian use values.

Expenditure was prioritized in the following descending order of priority: Social Responsibility and Projects, Tourism, Biodiversity and Conservation, Marine and Coastal Management, Environmental Quality and Protection and finally Administration costs. There was consideration of intrinsic values in some programmes. The Biodiversity and Conservation Programme revealed an intrinsic valuation of nature in keeping certain species alive regardless of their immediate transformative use-value for human beings; the Biodiversity and Conservation Programme was also concerned with keeping the natural world untouched simply because of its value as wilderness (apart from its tourism value); and the Environmental Quality and Protection Programme also upheld intrinsic values in focusing on developing legislation that could protect and enforce environmental standards like air quality.

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But, how is an adaptive management analysis able to include more intrinsic evaluations of nature in the decision-making context of the budget? An analysis of DEAT's budget with localism as a guideline accentuated two values upheld by the City of Cape Town that could have been reflected in this department's budget: the need to decrease waste generation and the need for more green open space in Cape Town. The waste issue was an immediate short term need that if not addressed could create immediate ecological and social problems within Cape Town. The city's waste dumpsites were almost full (In 2005 no landfill in Cape Town had a remaining lifespan of longer than 18 months) and waste disposal had increased by 18% since 1993. (City of Cape Town, 2005: 23, 24) There thus existed a strong utilitarian justification for improving waste management policy and spending money on creating adequate waste dumpsites as a matter of urgency. This issue would have been addressed even within a monistic neo-classical economic framework because of its urgency.

However, Cape Town's need for green open space was a more intrinsic environmental concern that was not reflected at all in DEAT's national priorities. While it was true that

it also represented a utilitarian recreational use value as well as a utilitarian property value for the city, open natural space in the city is also largely enjoyed for its own worth. I made a case for why it should have been included in the national budget despite it being a local authority competency. The point I wish to make here is that if urban open space remained a primary concern of the people of Cape Town, localism as a guiding principle would provide a way of highlighting its importance and justifying its possible inclusion in budgetary expenditure at a national level. This is, of course, if it could be shown, through local sustainability reports, that it indeed was a common problem in most towns and city centres.

Multi-scalar analysis, or the commitment to follow the systematic consequences of our acts as they play out on different scales of time and place (Norton, 2005: 93), offers another opportunity to include intrinsic values within the economic system. A multiscalar analysis of DEAT's Biodiversity and Conservation and Environmental Quality

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and Protection Programmes would reveal the connection between current economic activity and biodiversity and conservation, both on land and in marine and coastal areas, and therefore ultimately on intrinsic values. With the assistance of indicators that measured the economic impacts (use values) on protected areas as a whole or on specific endemic or endangered species (intrinsic values) inside and outside of protected areas, DEAT would be able to monitor the impact of use values on intrinsic values.

Institutes like the South African National Biodiversity Institute could provide DEAT with the necessary research data on endangered species and the threats to them. DEAT's marine and coastal management's programme already has much data on fish stocks for the issuing of permits and this kind of information could simply be extended for the protection of non-commercial endangered species. The subjective intrinsic value sustainability indicators of multi-scalar analysis would include indicators like the percentage of South Africa's coastal waters that are protected; the

change in the fish stock of protected fish (South Africa, DEAT, 2006c: 113) and other marine species; the percentage of polluted coastal waters.

Adaptive management's multi-scalar analysis provides one with an opportunity to investigate the relationship between utilitarian use values and intrinsic values. If society in its pursuit of utilitarian use values exploits natural resources beyond a certain point then it begins to affect some intrinsic values like sense of place values, or wilderness values, or specific species that require certain environmental constants or limited levels of contamination or pollution to survive. Multi-scalar analysis provides a justification for the protection of intrinsic values by establishing the connection between micro level economic decisions and their impact on the macro level environment.

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This is precisely the focus of adaptive management, rather than attempt to reduce valuation to either intrinsic or human use values, to look at the connections between these ways of valuing the world and what common action they would support. (Light, 2003: 234) The interplay of values might in some instances result in adopting different production or management processes that better suited the social and/or environmental context.

In DOA's budget, the guidelines of adaptive management similarly revealed the utilitarian focus of the department towards the environment with no mention of subjective intrinsic value. However, the guideline of multi-scalar analysis, that had the potential to be highlighted in the Sustainable Management of Resources and Use Programme with their monitoring of agricultural resources, could assist the department in recognising the impact of increased agricultural activity on other ways of valuing the natural environment. To illustrate using a fictive example, the Agricultural Department of the local authority of Stellenbosch could monitor how increased viticulture in the winelands town of Stellenbosch could lead to critically endangering some species of fynbos. A

debate about how much land should be zoned agricultural and how much should be left as fynbos in the Stellenbosch municipality would amount to be a debate in which utilitarian use values are being placed against a more intrinsic appreciation of the natural world in its more pristine state. If adaptive management's interplay of values was allowed to proceed, it could also lead to different agricultural growing and management processes in viticulture within the confines of the local authority as farmers and environmentalists discussed solutions, or it could lead to a percentage of land on farms being set aside for fynbos. The interaction of roleplayers and their viewpoints would give rise to a plethora of possible solutions.

In the Department of Trade and Industry budget, where the environment is unquestioningly accepted as a resource, adaptive management's guideline of multi-scalar analysis would be able to trace the impact of trade and industry decisions on the broader environment. This could be achieved by showing how localised trade and industry decisions impact on the broader environment both in the present and future, through the
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use of indicators like the increase in heavy industry versus the quality of air in the City of Cape Town. This would show how shorter-term use values ultimately impact on longer term intrinsic values.

Similarly, to the DOA example above, this interaction between shorter-term use values and longer term intrinsic values could give rise to many possible solutions, some might advocate different industrial production processes and/or management systems, others might suggest relocating industries or others still, pursuing alternative industrial projects in that same. The outcomes of such an interplay of values are unpredictable.

In conclusion of this section, environmental pragmatism removes the ontological significance of objective intrinsic valuation without doing away with the need to look beyond immediate human needs to protect the environment. This is because, while all

acts of evaluation are anthropocentric and utilitarian in some sense, intrinsic values encourage us to look beyond ourselves as human beings to the non-human world as well as future generations. Norton's adaptive management with its emphasis on accommodating both economic use values and intrinsic values simultaneously encourages people to adapt their short-term economic decisions to better suit their long term values.

However, it is important to point out that I defend Norton's adaptive management on the basis that it provides a methodology with which to allow for the full range of environmental values in economic decision-making. It is not necessary for protagonists of intrinsic value to accept pragmatism as an ethical theory in order to engage in Norton's epistemic communities, they merely have to agree to the process of engagement with those who share opposing viewpoints and commit to arriving at joint solutions or visions. ⁴² This would prevent environmental pragmatists from trying to convince others that environmental pragmatism was the only ethical solution to all problems in

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This viewpoint is in keeping with Andrew Light's idea of defending a methodological environmental pragmatism on a public policy level and only entering into meta-ethical debates within the academic context of environmental ethics as a discipline. Light discusses within the context of bioethics with references to environmental ethics. I am applying it here in relation to environmental ethics specifically. (Light, 2002b: 80, 91-93)

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environmental ethics, an approach which would go against the philosophy of pragmatism itself, which is to allow truth claims to emerge within particular contexts.

F. Criticisms of Norton's environmental pragmatism as an approach to economic decision-making

In this section, I will defend Norton's environmental pragmatism against criticisms:

firstly that it might develop into a form of centralised planning within the economy; secondly that it overcomplicates decision-making; thirdly that Norton's approach is focused on processes rather than outcomes, and therefore cannot ensure that environmental concerns will be given priority status in economic decision-making; and finally that Norton's somewhat idealistic understanding of the concept of community and his ignorance of power relations makes his methodology difficult to implement.

Firstly, I will respond to a concern that could be raised that Norton's version of environmental pragmatism, as discussed in this thesis, could lead to an economy that is centrally planned, i.e., an economy whose means of production and distribution are controlled by the state.

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This concern arises from the fact that Norton advocates the need for environmental advisory committees that set goals and indicators that would attempt to direct decision-making within the economy. The idea that the freedom of choice of individual consumers within the market system might be restricted by the decisions of these advisory committees could be seen as a potential red flag for some economists who fear the perils of communism. However, while this might theoretically pose a problem to a dogmatic supporter of neo-classicism, Norton's environmental pragmatism does not seek to replace market forces with community structures run by environmental groups that dictate the needs of individuals. I believe that what Norton is likely to warn against is exchange value, as determined by the market, being the only yardstick that is measuring the value of the environment. Norton is after all equally critical of environmental ethicists who attempt to reduce all valuing of the environment

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Pearce (1989:327) defines a planned economy as follows: "an economy where the crucial economic processes are determined to a large extent not by market forces, but by an economic planning body which implements society's major economic goals."

within the economy to expressions of intrinsic value. (Norton 2005: 180, 181) The emphasis in Norton's advisory committees is on inclusivity, attempting to get experts (economists, scientists etc) and community stakeholders, who are also consumers I might add, to sit around the same table. These local advisory committees are aimed at creating spaces for public debate in environmental management alongside the prevailing consumer instinct of individuals.

What does that mean in practical terms in the economy? It means that vested business interests and community-driven environmental concerns have to be weighed together in specific contexts. Processes need to be created within economy that allows private enterprise and communal interests to search for joint solutions. Environmentalists should continue to try and influence market values through social structures like local and national budgets. Business should continue to find environmentally sensitive ways of making profits. It would be equally unwise to remove private ownership and initiative from the economy as it would be to ignore communal concerns and the interests of future generations within the economy. Norton's adaptive management seeks to create long term development paths with sustainability indicators that reflect both business interests and communal interests.

The second point of potential criticism is that Norton's environmental pragmatism, as expressed in adaptive management, overburdens decision-making with too much information, i.e., it results in information overload and is just too complex. I argue that decision-making in information rich, technology-driven economy with mounting environmental and social concerns is an already complex task. Norton's approach, in fact, helps to simplify it by proposing a methodology that makes explicit the values that underpin environmental decision-making within the economy. This space is created within the environmental advisory groups that allow for the diversity of values and

solutions to be expressed and debated. It is a space where values have the opportunity to grow and adapt.

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Another perceived limitation of Norton's understanding of environmental pragmatism, is that it is not able to guarantee that environmental concerns will be taken seriously in economic decision-making. Norton's potential paths for sustainable development also have the potential to be unsustainable development paths, depending on the localised response to a given set of circumstances. At best within this philosophy, one can attempt to influence, lobby and gather support for one's own point of view and substantiate this with experimental or empirical evidence. Increased information about the environment or an increased responsiveness to the environment does not necessarily mean a greater appreciation of nature for its own sake. It could result in an increased awareness about how to transform nature or exploit it even further.

However, while there are no guarantees that Norton's insights will be able to protect all aspects of the environment, this is not a weakness that is unique to environmental pragmatism as an approach to environmental ethics. There are no guarantees that any ethical approach no matter how convincing will result in a complete change of practice on the ground. In fact, Norton's adaptive management approach, I argue, stands a better chance than intrinsic value theories from being heard and therefore adopted in economic decision-making. This is because it is not focused on promoting a particular vision of what should be protected, but rather about making an argument for a particular process that is necessary to continue to allow environmental concerns to be heard in economic decision-making. This is precisely what is needed at this point in time, that is, a process that will break through the ideological impasse that prevents environmental concerns being fully heard in economic thinking.

In this thesis, I have demonstrated the power of Norton's process approach with the possibilities it opens up within the South African National Budget

Process as well as individual budgets. Norton's insistence on iterative, information rich systems that rely on experience drawn from local contexts understood within a multi-scalar framework inspired the following: the creation of a proposed Department of Sustainable Development; a proposed Environmental Commission, a proposed Standing Committee on Sustainable Development; a proposed Environmental Cabinet Cluster and; local
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municipal environmental advisory committees. It also provided insights into how to alter individual budgets so they could better accommodate environmental concerns. To illustrate with an example: it demonstrated the need for retraining in the Department of Trade and Industry and the need for an increased focus on waste management in the Department of Environmental Affairs and Tourism as well as a new focus on urban agriculture in the same department.

If I had taken Callicott's approach of proposing "a univocal ethical theory embedded in a coherent worldview that provides ... for a multiplicity of hierarchically ordered moral relationships ..." (Callicott 1999: 168) I might have arrived at a similar plethora of possibilities. However, Callicott's approach is unlikely to be heard within the budget process without an environmental pragmatist process in place like the one suggested in this thesis. Callicott's views would need to be "sold" to key stakeholders in the National Budget Process. Some would buy it and some not. His efforts would be on the conversion of the stakeholders to his point of view, followed by concerns about ensuring their compliance. While conviction through force of argument is a reasonable goal, it is likely to fall on deaf ears given the ideological focus of economic thinking regarding environmental issues. Callicott's viewpoints, without the methodological process suggested by Norton, has limited application within the budget process.

But perhaps one of the most potentially serious concerns regarding Norton's approach is one about his focus on community participation as an integral part

of environmental decision-making. He could be criticised for an unhealthy idealisation of the concept of community as well as, in places where community does not currently exist, the orchestration of a community, or worse still, it being coerced into being. There is a real danger of this occurring if one interprets Norton's understanding of community too strictly, i.e. a group of people who live in the same place and share the same vision of the good life. It is unlikely that this still exists in many urban areas.

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Holly (2007: 343) raises this concern in her critique of Norton's book, *Sustainability: A Philosophy of Adaptive Ecosystem Management*.

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She questions whether some places

still have a particular way of life worth preserving. Referring to Gainesville in Florida, she states that a large percentage of the population, which is made up of students and professionals, are mobile and only few families have roots in the place. Big apartment blocks and business complexes makes the relationships between people impersonal. She asks whether Norton's ideas about cultural and social sustainability are always applicable in towns like these today. Norton (2007: 400) himself responds to Holly's concern by claiming that the mobility of people need not result in a loss of place values because people could value many places. Moreover, he defends his community/expert driven process claiming that despite the obvious pitfalls of community engagement, this approach remains an improvement on the top down and one size fits all management strategies that exist.

However, I do not think that Norton's defence of his argument is adequate. I would argue that Norton's approach to community participation does not necessarily need a community to exist prior to the process of participative engagement. The act of developing a citizen advisory committee itself builds community

through a process of social engagement.

Environmental issues are in fact, great opportunities to build community. Neighbours who normally barely greet one another, are quickly mobilised as a community when it is in their interests to do so. Communal issues like factory pollution, burst water pipes and fly infestations get neighbours talking, lobbying the local municipality and looking for common solutions.

Holly (2007: 337, 348) and Hickman (2007: 371) suggest that Norton is being somewhat idealistic about the engagement of stakeholders in environmental decision-making. Holly states that Norton assumes that “frivolous and troublemaking” people do not engage in environmental decision-making. Hickman wonders whether Norton’s expectations regarding community interactions are not “overly sunny”. I think their concerns are

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Norton, B. 2005. Sustainability: A Philosophy of Adaptive Ecosystem Management. Chicago: The University of Chicago Press.

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justified given that Norton (2005: 278–290) in the aforementioned book Sustainability: A Philosophy of Adaptive Ecosystem Management looks to Habermas for a procedural framework to build an ideal speech community where participants accept certain rules of interaction in their quest for joint problem solving.

He is searching for an ideal situation when he calls for stakeholders in environmental decision-making to share a commitment to community problem-solving that allows for claims and counterclaims by participants and the testing of claims through experience. This is further emphasised when he requires that they should be first committed to the process of communication and truth seeking and secondly to their initial points of view. In Searching for Sustainability, Norton and Steinemann (Norton and Steinemann 2003: 534) describe this in more details when they talk about stakeholder

interaction where people trust each other enough to share a common vision of central questions and problems and to be able to jointly choose between policies. They go even further suggesting that members of stakeholder advisory committees should also be in an ideal speech communication relationship with their respective constituents so that the decisions they take in these stakeholder advisory communities also enjoy broad support.

Norton (2007: 402) acknowledges that he is being idealistic. He defends this by stating that he was asking the question "what if" we assumed trust and a willingness to cooperate in environmental decision-making. He says his recent book *Sustainability: A Philosophy of Adaptive Ecosystem Management* is entirely hypothetical, it applies only to processes where participants are committed to an inclusive process of truth seeking and where they use environmental science to test claims and find appropriate solutions.

Norton (2007: 404) also admits that his work does not address political and economic power relationships but that it rather proposes a "rational process that is possible – but hardly guaranteed." He also acknowledges that if powerful forces within the economy and politics refuse to participate in the manner of an ideal speech community then his inclusive, experimental process will fail. He says it will also fail if participants in environmental decision-making decide to attack each other.

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The likelihood of the above happening, especially in South African politics, given the tender age of the country's democracy, is very likely.

Political parties are more

concerned with scoring points off their counterparts than committing towards a deliberative, inclusive process that uses environmental science to test the effectiveness of policy decisions in environmental problem solving. However, I do not think that Norton's adaptive management approach is therefore to be discarded. In fact, if anything, the realities of power plays within politics, makes it all the more

imperative to set up with institutional arrangements that create mandatory spaces where social learning can take place. It strengthens the argument for putting in place deliberative decision-making processes or protocols that would allow for effective engagement in the midst of power politics.

In this thesis, I demonstrated what form these institutional spaces could take within the South African National Budget. I showed what an ideal budget process would like if it took on board Norton's guidelines of experimentalism, localism and multi-scalar analysis. In the section on the budget process I used Norton's guidelines to do the following:

- To justify increasing the time which Parliament had to discuss budget priorities and comment on them;
- To motivate for a Department of Sustainable Development that monitored departmental performance in term of sustainability indicators;
- To advocate for local advisory committees at local government level;
- To propose an indicator driven budget system;
- To propose an Environmental Commission so as to include environmental activists and researchers in the budgeting process;
- To propose a Standing Committee on Sustainable Development that monitored the environmental, social and economic impact of all programmes in government with the help of local and national indicators formulated through consultative processes with local advisory committees at municipal level;

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- To propose an Environmental Cabinet Cluster and Directors-General Cluster tasked with ensuring the effective intergovernmental implementation of government policy on environmental matters with the help of locally generated and nationally aggregated sustainability indicators.

The power of Norton's environmental pragmatism lies in the justification its guidelines provide for developing ideal decision-making processes. It might not be able to guarantee that this process will always be followed even if it is mandated but

it does at the very least provide a vision and a methodology for achieving it. Moreover, it provides justification for a host of institutional arrangements that allow for open, deliberative debate and experiential learning within economic decision-making. I submit that these gains could be supported even if one remained critical of some aspects of Norton's pragmatism.

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CONCLUSION

In this thesis, I set out to test how effective environmental pragmatism was at developing an environmental ethic for economic decision-making. This question arose following an attempt to understand what it was within economic decision-making processes that was preventing sustainable development from being implemented effectively. Why, despite all the lip-service that the concept of sustainable development receives within society worldwide, was environmental degradation continuing and in some cases, like in South Africa (South Africa. DEAT, 2006a: 3), getting worse?

What kind of ethic was

misleading our economic decision-making processes?

In chapter one, I highlighted some of the problems of treating the environment exclusively as an externality that could be costed into the functioning of the market mechanism in economic decision-making. I looked at how ecological economics addressed many of these issues by placing the market mechanism within social and ecological contexts. While this presented useful insights, ecological economics remained reductionist because it subjected most of these additional contextual factors to monetary evaluation and therefore relied on "use-value" to make decisions about the environment.

In chapter two, I discussed the need for a form of moral pluralism which was able to take on board intrinsic evaluations of the environment as well as use-values. I made an argument for adopting environmental pragmatism as a way of achieving

this, because it offered both the plurality of values that was necessary to achieve a viable ethic as well as a means of prioritising these sometimes clashing values. Environmental pragmatist Bryan Norton's adaptive management approach provided useful methodological insights to achieve these two ends. Norton's concepts of localism, multi-scalar analysis and experimentalism provided a way of showing how different ways of valuing related to each other and how their prioritisation lead to the creation of different development paths that were tentative and open to correction through experience.

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In chapter three, I demonstrated how effective Norton's guidelines could be at analysing the South African National Budget of 2005. Due to the enormity of the budget document, I chose only three budget votes to analyse: that of DEAT, DOA and the DTI. These departments all largely confined themselves to utilitarian evaluations of the environment, with some hints of intrinsic value emerging within the DEAT budget. Norton's guidelines of localism, multi-scalar analysis and experimentalism were designed to produce a variety of analyses of the budget, depending on what mix of values were selected by a community as priority.

My analysis was undertaken using indicators derived from The City of Cape Town Sustainability Report of 2005 and the 2020 vision of the Integrated Development Plan of the City of Cape Town in 2004/5, and it also referred to South Africa's National State of the Environment of 2006. The analysis revealed the need: to increase the size of the DEAT budget but reduce their focus to only those programmes concerned with the more intrinsic valuation of nature like biodiversity and conservation; to extend the DOA's mandate to include urban agriculture and to increase expenditure on the sustainable management of agricultural resources; and to ensure that all the DTI's programmes were sensitive to environmental impacts and incentivised ecologically beneficial production processes. Moreover, it was suggested that all departments should use sustainability

indicators as well as performance indicators to measure the impact of their programmes on the environment.

However, perhaps the biggest contribution of environmental pragmatism lies in its bottom-up approach to environmental issues within economic decision-making. Unlike Callicott's approach, which is one of seeking to provide a single, coherent metaphysical argument for how the environment should be valued, (Callicott, 1999:169) Norton's approach does not impose valuations on a situation. Its focus is rather on creating a process that is inclusive, that is, setting out to acknowledge the variety of ways in which people currently value the environment in a given context and working from there towards jointly agreed development paths.

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Norton's approach sets up processes within decision-making structures that allow participants to arrive at their own conclusions and test them with experience. His route is the long, bumpy road of social learning. This approach is arrived at through trial and error (experimentalism) in real-life contexts (localism) with the consequences judged over short and longer time periods (multi-scalar analysis).

It could be argued that the tentative nature of Norton's adaptive management takes much of the authority out of the concept of intrinsic worth and therefore the ability of environmental pragmatism to prevent the exploitation of the environment within economic decision-making. This is because many environmentalists morally justify their protection of the environment based on the fact that certain parts of the environment possess inalienable intrinsic worth and therefore are non-negotiable and cannot be exchanged for money in the market place or valued in terms of their use. However, in an environmental pragmatist philosophy, nothing has that kind of inalienable worth, not even human beings. All forms of valuing, even the way in which humans value each other, is open to being reviewed or reconsidered by the participants in a decision-making structure. Environmental pragmatism relies only on democratic

decision-making
structures and institutions to achieve its ends.

Why, given the humbleness of environmental pragmatism and its unwillingness to force conclusions on society, should we engage with it? The answer is a pragmatic one. At this point in history, society needs to develop a methodology to move beyond the ideological stalemate that has occurred between environmental ethics and economics. In order for economists to receive the wisdom of Callicott's communitarian ethic, and environmental ethicists to acknowledge the contribution of market solutions to environmental problems, an open deliberative process needs to be created that will encourage these stakeholders to commit to joint development paths.

An environmental ethic attempting to guide

economic decision-making has to work with human beings' self-interested economic interests, not against it. Norton's adaptive management guidelines of experimentalism, multi-scalar analysis and localism provide us with a way of doing just that.

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Norton's ethic encourages economic decision-makers, through the slow process of trial and error learning, whether in budget processes or in environmental impact assessment, to make choices amidst a plurality of value choices that are reflected over short and longer term time scales. The possibilities of this approach are endless and the development paths are as numerous as the prioritisation of values that are possible. The limitations are linked to the limitations of democratic decision-making to bring about effective change in society. This is a topic worthy of another thesis.

One could also ask what unique contribution environmental pragmatism makes towards environmental ethics as a discipline. I believe it demonstrates just how valuable a pragmatist methodology could be for the facilitation of ethical deliberation about the environment in society. Without an effective process whereby new ethical theories can be

heard and tested within real life contexts, ethical deliberation about the environment remains isolated to academic journals and is unable to infiltrate public decision-making processes. The strength of Norton's adaptive management guidelines of experimentalism, localism and multi-scalar analysis is that they create a platform for an influential conversation between environmental ethicists and stakeholders in real life environmental management problems.

The beauty of this pragmatist platform is that you do not have to be a proponent of pragmatism to make use of it. Pragmatist inspired methodology has merely provided the operational rules of conversation for ethicists to engage with other environmental stakeholders on matters of environmental concern. This methodology, when institutionalised in contexts like the South African National Budget process, creates the much-needed opportunities for ethicists to engage with and influence public policy making on the environment. The value of environmental pragmatism, as discussed in Norton's adaptive management approach, is that it finds this as yet undiscovered path through which the accumulated wisdom of more than 40 years of environmental ethics can be channelled into real life environmental management contexts. Up to date this has not been achieved.

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Finally, then one could also ask the question what unique contribution has the analyses in this thesis made towards environmental ethics as a discipline? I liken the task of this thesis to that of Galileo and the telescope. Galileo did not invent the telescope (Laney, 2008), someone else did. He merely turned it to the heavens and in doing so made some amazing discoveries.

Similarly, in this thesis, I did not invent Norton's adaptive management ethic. He did. I did not improve on it by providing a thorough critique of it or environmental pragmatism for that matter. Instead, like Galileo, I merely turned it towards something I do not think Norton himself would have

contemplated possible – the South African National Budget. In doing this I demonstrated the power of his methodology to influence public deliberation on the environment in South Africa, and potentially elsewhere too.

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Appendix 1

ADDITIONAL BODIES REQUIRED IN AN ADAPTIVE MANAGEMENT BUDGETARY PROCESS ENVIRONMENTAL COMMISSION

The Environmental Commission's job would be to protect the integrity of South Africa's ecosystems, rivers, soil, marine environment, endangered and endemic species and key

strategic natural resources like the Kruger National Park. The Commission would comprise of members of leading environmental institutions in South Africa like the South African National Biodiversity Institute, the Oceanographic Research Institute and also long-standing environmental activist organizations like the Wildlife and Environment Society of South Africa. They could play a Parliamentary watchdog role (Foster, 2008) over the country's natural resources through monitoring local and national sustainability reports and comparing these reports to the country's chosen development path as described in municipal Integrated Development Plans and the South African National Budget. It is envisaged that they could have similar powers to the Human Rights Commission in South Africa (South African Human Rights Commission, n.d.) in that they could: investigate complaints of environmental violations; search and seize documents; hold formal hearings; and litigate on behalf of the environment.

THE STANDING COMMITTEE ON SUSTAINABLE DEVELOPMENT

The Standing Committee on Sustainable Development is envisaged to have similar powers as the Standing Committee on Public Accounts (SCOPA) in South Africa. (Parliament of South Africa, n.d.; Foster, 2008). SCOPA currently acts as Parliament's watchdog over how taxpayers' money is spent by the executive. It can call heads of government departments and state institutions to account for their expenditure in the Auditor General's Report, and if necessary, recommend that the National Assembly take corrective action. Similarly, the proposed Standing Committee on Sustainable Development could use the National Sustainability Report and local sustainability reports

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as their "accountability reports" and call departments in government and state institutions to answer for any failures to uphold sustainability indicators and if necessary recommend that the National Assembly take corrective action. They would also report on the achievements of the various departments in making progress towards selected

sustainability indicators that were relevant to their department's activities.

THE DEPARTMENT OF SUSTAINABLE DEVELOPMENT

The function of the proposed Department of Sustainable Development would be threefold. Firstly, to facilitate the generation of sustainability indicators through the funding of local sustainability reports, provincial sustainability reports and national sustainability reports. The proposed department would need extensive data management services and be responsible for collating the information from local sustainability reports to form the national sustainability report. Secondly, the proposed department would be responsible for ensuring compliance within government departments with regards to sustainability indicators. This could be achieved with the help of the above-mentioned Standing Committee on Sustainable Development who would report to Parliament on the progress of departments. Thirdly, it is also envisaged that this proposed department act as an environmental protection agency and be responsible for prosecuting transgressions of environmental legislation. It is proposed that they should take over and expand the functions of the current enforcement directorate within the Department of Environmental Affairs and Tourism in South Africa.

LOCAL MUNICIPAL ENVIRONMENTAL ADVISORY COMMITTEES

The function of the local municipal environmental advisory committees would be to oversee the development of local municipal sustainability reports. These committees would consist of representatives of all stakeholders in local communities including community activists, scientific experts in local conditions and local government representatives. (Norton, 2003: 533) They would oversee the compiling of sustainability reports that were commissioned by the proposed national Department of Sustainable
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Development as well as the revising of sustainability indicators so as to ensure that they represented local values and environmental, social and economic concerns. They could

use these reports to make representations to Parliament regarding matters that they believe might have been left out in budgetary decision-making.

AN ENVIRONMENTAL MINMEC

This would be a committee comprising the National Minister for DEAT and nine provincial ministers of the environment. Much like other MinMecs, (Hickey and Van Zyl, 2002: 116) this would be a political committee supported by departmental officials who focus specifically on environmental issues throughout national and provincial government departments.

AN ENVIRONMENTAL 4x4 OR JOINT TECHNICAL COMMITTEE

This committee would specifically focus on environmental concerns in intergovernmental relations. It would consist of four provincial departmental officials and four national departmental officials. Their job would be much like other 4x4s, that is, to examine trends in environmental spending and model the effects of new policies. (Hickey and Van Zyl, 2002: 103)

AN ENVIRONMENTAL CABINET CLUSTER

This Cabinet cluster would be a meeting of most ministers of national departments. (most departmental activities have an impact on the environment) and focused on the implementation of environmental policy.

Cabinet cluster committees are aimed at

reducing the fragmentation of governance and improving implementation of policy. (South Africa. Department of Provincial and Local Government, 2002: 9)

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AN ENVIRONMENTAL DIRECTORS-GENERAL CLUSTER

This body would discuss the implementation of the deliberations of the Environmental Cabinet Cluster. They would be held accountable to Cabinet.

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Norton's depictions
Appendix 2a

In this diagram Norton shows how global values can be traced back to individual values.
Or put differently, individuals values are formed in communities that are in turn influenced by global values.
(Norton 2003: 70)

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Norton's depictions
Appendix 2b

Norton and Steinemann's diagram A shows how individuals experience their environment as a mixture of choices and constraints. Norton and Steinemann's diagram B shows how when individuals make certain choices and discard others, it influences the future generation's options and choices.
(Norton and Steinemann 2003: 524)

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Appendix 3a
CURRENT BUDGET PROCESS
GOVERNMENT POLICIES
CONFERENCES

CABINET MEETINGS

April
POLITICAL EXECUTIVE
MinComBud
Budget Council
Budget Forum

TECHNICAL PROCESS
National Treasury
4x4's

Division of Revenue
DOR

Resource
Envelopes
Guidelines

Estimates of
National Expenditure

National Departments
Provincial Departments

February
Parliament

Under a month
National Joint Budget Committee

Start of
Financial Year

In this diagram, I show how the current budget process is driven by the Political Executive and implemented by the Treasury. It allows less than a month for discussion on the budget in Parliament before the start of the financial year. It offers no way of tracing the direct impact of national and provincial budgetary expenditure on local municipalities or communities.
(Graphic design: Brandon Booth)

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Appendix 3b
ADAPTIVE MANAGEMENT BUDGET PROCESS
GOVERNMENT POLICIES
CONFERENCES

CAB
INET MEET
INGS

April

SI

Environmental
Cabinet Cluster

SI

Environmental
MinMec

SI

Environmental
4x4

SI

Environmental

Directors-General
Cluster

POLITICAL EXECUTIVE

MinComBud
Budget Council
Budget Forum

Sustainability
Indicators
(SI)

National Treasury

Resource
Envelopes
with SI

4x4's

Guidelines
with SI

TECHNICAL PROCESS

SI

SI
Estimates of
National Expenditure

Division of
Revenue
DOR

National Departments
Provincial Departments

Department of
Sustainable Development

November
Parliament
(November to February extended time)

SI

Provincial IDP's

National Joint Budget Committee
Provincial Sustainability
Reports

SI

SI
More than
3 months

SI

Municipal Sustainability
Reports
Municipal IDP's

Environmental
Commission

Standing Committee
on Sustainable
Development
Local Municipal
Environmental
Advisory Committees

February

Start of
Financial Year

In this diagram, local municipal environmental advisory committees oversee sustainability reports and sustainability indicators at municipal level. The proposed Department of Sustainable Development then collates this data to create provincial and national sustainability reports and indicators, which are then used throughout the budgetary process to justify expenditure. The proposed Standing Committee on Sustainable Development use the sustainability indicators to hold government departments accountable and the proposed Environmental Commission use the sustainability indicators to hold the political executive accountable. Parliament's discussion of the budget is extended to more than 3 months
(Graphic design: Brandon Booth)

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Appendix 4

Department of Environmental Affairs and Tourism's Estimated
Programme Expenditure
of 2005/6

Administration
8%
Social Responsibility and
Projects

25%

Environmental Quality and
Protection

11%

Marine and Coastal
Management

16%

Biodiversity and
Conservation

17%

Tourism

23%

(South Africa. National Treasury, 2005b: 653)

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Appendix 5

Department of Trade and Industry's Estimated Programme Expenditure
for 2005/6

Trade and Investment South
Africa

12%

Marketing

3%

Administration
International Trade and

8%

Economic Development

3%

Enterprise and Industry
Development

38%

The Enterprise Organisation

32%

Consumer and Corporate
Regulation

4%

(South Africa. National Treasury, 2005b: 800)

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Appendix 6
The Department of Agriculture's Estimated Programme Expenditure for
2005/6

Programme Planning,
Monitoring and Evaluation

0%

Communication and
Information Management
Administration

6%

10%

National Regulatory Services

14%

Sustainable Resources
Management and Use

11%

Agricultural Production

24%

Farmer Support and
Development

27%

Agricultural Trade and
Business Development

6%

Economic Research and
Analysis

2%

(South Africa. National Treasury, 2005b: 583)

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Appendix 7
South African National Budget's Total Vote Appropriation for 2005/6

Correctional Services
Sport and Recreation South
Africa

Defence

Independent Complaints
Directorate
Justice and Constitutional
Development

Social Development

Safety and Security

Agriculture
Communications
Environmental Affairs and
Tourism
Housing
Land Affairs
Minerals and Energy
Science and Technology
Trade and Industry
Transport

Labour
Health
Education
Arts and Culture

Water Affairs and Forestry
The Presidency
Parliament

Statistics South Africa
South African Management
Development Institute
Public Enterprises
Public Service and
Administration
Public Service Commission

National
Treasury

Foreign Affairs
Public Works

Government Communication
and Information Services

Home Affairs
Provincial and Local
Government

(South Africa. National Treasury, 2005b: iv)