Leveraging public programmes with socio-economic and development objectives to support conservation and restoration of ecosystems: Lessons learned from South Africa

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ABET	Adult Basic Education and Training
CWP	Community Works Programme
CSIR	Centre for Scientific and Industrial Research
DAC	Department of Arts and Culture
DAFF	Department of Agricultural Affairs and Forestry
DCOGTA	Department of Co-operative Governance and Traditional Affairs
DEA	Department of Environmental Affairs
DEAT	Department of Environmental Affairs and Tourism
DHET	Department of Higher Education and Training
DoE	Department of Energy
DoT	Department of Transport
DPW	Department of Public Works
DRDLR	Department of Rural Development and Land Reform
DTI	Department of Trade and Industry
DWA	Department of Water Affairs
DWAF	Department of Water Affairs and Forestry
EF	Eco-furniture Programme
EP	Environmental Programmes
EPIP	Environmental Protection and Infrastructure Programme
EPWP	Expanded Public Works Programme
FIMS	Fire Information Management System
FFA	Forest Fire Association
FTE	Full Time Equivalents
GEAR	Growth, Employment and Redistribution (Programme)
GOSM	Greening and Open Space Management
IA	Implementing Agent
IAP	Invasive Alien Plant
ICMA	Integrated Coastal Management Act
IDT	Independent Development Trust
KPI	Key Performance Indicator
LUI	Land User Incentive
MoU	Memorandum of Understanding
M&E	Monitoring and Evaluation
NDT	National Department of Tourism
NPO	Non-Profit Organisations
NRM	Natural Resource Management

NT	National Treasury
P&P	People & Parks
PES	Payment for Ecosystem Services
PIP	Project Implementation Plan
PMS	Project Management System
RDP	Reconstruction and Development Programme
RSA	Republic of South Africa
SALGA	South African Local Government Association
SANEDI	South African National Energy Development Institute
SANPARKS	South African National Parks
SMME	Small, Medium and Micro Enterprises
SRP	Social Responsibility Programme
ToC	Theory of Change
WE	Wildlife Economy
WfC	Working for the Coast
WfE	Working for Ecosystems
WfF	Working for Forests
WfL	Working for Land
WfW	Working for Water
WoE	Working on Energy
WoF	Working on Fire
WoW	Working on Waste
WWF-SA	World Wildlife Fund-South Africa
YES	Youth Environmental Service

1 Foreword

The Strategic Plan for Biodiversity 2011-2020 recognises that biodiversity underpins ecosystem functioning and the provision of services that are essential for human well-being. The fourth Global Biodiversity Outlook reports that biodiversity is still being lost and degraded at alarming rates. This loss threatens development and poverty eradication gains.

The conservation of biodiversity on its own is no longer a sufficient method; actions for restoring degraded ecosystems need to be strengthened and scaled up to maintain biodiversity and the human systems that depend on it.

Some countries have developed public programmes with socio-economic and development objectives that invest in large scale ecosystems conservation and restoration. These programmes offer individuals employment for a number of days each year (employment guarantee schemes) or on-going employment, as required, on a large scale during times of crisis or stress (short- term employment programmes). These programmes utilise labour intensive approaches for both development needs and ecosystem conservation and restoration goals.

The Conference of the Parties (COP) to the Convention on Biological Diversity (CBD) adopted at its eleventh meeting decision XI/16 to promote ecosystem restoration in an integrated manner, building on existing relevant past COP decisions and existing programmes of work, including activities such as addressing causes of ecosystem degradation or fragmentation, and identifying opportunities to link poverty eradication and ecosystem restoration and giving due attention to the rehabilitation of degraded ecosystems in order to restore critical ecosystem functions and the delivery of benefits to people.

By 2020, the Strategic Plan for Biodiversity calls for the rate of loss of all natural habitats, including forests, to be at least halved and where feasible brought close to zero, and degradation and fragmentation to be significantly reduced (Aichi Biodiversity Target 5) and for ecosystem resilience and the contribution of biodiversity to carbon stocks to be enhanced, through conservation and restoration, including restoration of at least 15 per cent of degraded ecosystems, thereby contributing to climate change mitigation and adaptation and to combating desertification (Aichi Biodiversity Target 15).

In this context, the Secretariat of the CBD, with the generous financial contribution of the German Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety, has initiated this study with the Palmer Development Group on the potential of public programmes with socio-economic and development objectives to contribute to large-scale biodiversity conservation and ecosystem restoration, and how biodiversity conservation and ecosystem restoration can contribute to poverty alleviation and development.

The objective of the study is to provide best practices and lessons learned to assist countries to understand the potential of public programmes with socio-economic and development objectives to contribute simultaneously to poverty alleviation and development and large scale biodiversity conservation and ecosystem restoration goals.

The study elaborates on how the Government of South Africa developed and designed large-scale environmental restoration and maintenance programmes, starting with the Working for Water programme, including the criteria for success, the enabling factors, and the key principles that can be replicated.

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Executive Secretary
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2 Introduction

South Africa has undergone profound political and social change in the past 20 years since the end of apartheid and the election of the country's first democratic government.

Prior to 1994, environmental governance was both selective and highly fragmented in its application. The apartheid government placed great emphasis on certain environmental aspects, such as conservation and water infrastructure, yet environmental policies and services were formulated within a framework that perpetuated social inequality. The new South Africa was faced with a legacy where environmental resources had been used for the benefit of a minority, and were viewed largely as an extractive resource, with little attention paid to issues of sustainability (Republic of South Africa (the Presidency), 2013).

The peaceful transition from Apartheid in the mid 1990's was accompanied by a complete overhaul of not only the country's Constitution, but also its policy priorities, legislation and regulation. This created a unique moment in time, where there was great willingness to build on best international practice, and to try different approaches.

Shortly after the first democratic elections in 1994, largely due to the insight of a few dedicated individuals, the South African government launched a large-scale environmental restoration and maintenance programme. This first programme became known as the Working for Water (WfW) programme, which focuses on the management of invasive alien plants using labour intensive methods to ensure and restore hydrological functioning. The success of the WfW programme in combining both environmental and socio-economic goals laid the groundwork for a broader public works programme, and under the umbrella of the National Poverty Relief Strategy and later the Expanded Public Works Programme (EPWP), a variety of other Environmental Programmes (EP) have also been developed.

Therefore, environmental programmes with the combined objective of creating employment have been in place in South Africa since 1995 when the government launched the Working for Water programme. Since then the expanding number of sub-programmes have garnered an increasing commitment of funds from the national fiscus.

The environmental programmes in South Africa are broadly divided into two main programmes, Natural Resource Management (NRM) which developed out of the original Working for Water programme, and Environmental Protection and Infrastructure Programme (EPIP), which has evolved out of successive national employment programmes. Within these two main programmes there are currently 14 'sub-programmes' (shown in the table below) all of which comprise public environmental activities with socio-economic and development objectives which contribute to large-scale biodiversity conservation and ecosystem management.

Table 1: The NRM and EPIP sub-programmes

Natural Resource Management (NRM)	Environmental Protection and Infrastructure Programmes (EPIP)
Working for Water	Working on Waste
Working for Ecosystems	Working for the Coast
Working for Forests	Working for Land
Working on Fire	Greening & Open Space Management
Working for Wetlands	People & Parks
Working for Energy*	Wildlife Economy
Eco-Furniture Programme*	Youth Environmental Service

** Note: These comprise the value-added sub-programmes*

This paper explores the evolution of these sub-programmes, starting with the Working for Water programme, their development, performance, and achievements to date. Specifically, it aims to unpack the different historical origins of these sub-programmes and the nature of their design and implementation, and to identify the factors which have facilitated their execution. It attempts to draw out key success factors, shortcomings, and lessons for other countries pursuing similar programmes.

2.1 Historical context: environmental degradation and poverty

Prior to 1994, access to environmental resources for benefit use and sharing was skewed towards the minority with the majority of the population denied access to environmental resources for livelihoods. The right to a clean and healthy environment was not enshrined in a constitutional system, but was nevertheless selectively applied, with "white" areas enjoying a high degree of environmental protection. These rights included proper waste management, good air quality, and well maintained public open space. Black communities were located on the periphery of urban areas, usually adjacent to industrial areas with comparatively lax environmental controls, and suffered negative health impacts accordingly. Also, the strong emphasis on waste management in white group areas, provided through municipalities, resulted in infrastructure such as landfills being located next to black townships. The former "Homelands"[1] were largely rural, with land of low agricultural productivity, prone to erosion, inadequately developed water supplies and far from economic opportunities.

Environmental management was largely motivated by exploitation in relation to mineral resources, and conservation areas which were sometimes declared after relocation of rightful owners. The majority of population did not have access to

[1] The Homeland or 'Bantustan' system sought to assign every Black South African to a 'homeland' according to their ethnic identity. Ten homelands were created, serving as labour reservoirs, housing the unemployed and releasing them when their labour was needed in 'South Africa proper'. After 1994, the homelands were reincorporated into the republic.

national parks nor were they allowed to sustainably harvest wildlife or other biological resources in areas close to them. All of these factors contributed to both a degraded urban and homeland environment for many South Africans, and a misperception that environmental issues, such as conservation, were only relevant to a minority (Republic of South Africa (the Presidency), 2013). These factors have also played an important role in the development of many of the environmental sub-programmes, which are aimed at both addressing this historical legacy, and changing perceptions of "environmental" concerns.

The poverty and development challenges in South Africa are unique because of past policies and the legacy of the former homeland system that entrenched poverty. As a result of the apartheid system, rural South Africa was characterised by "high-density populations living in abject poverty" (DEAT, 2004) and the resulting population pressure depleted the natural resource base in the homeland areas. As a result of all these factors, the relationship between the nature of poverty, its distribution and impact on the environment in South Africa is very complex. Based on this, in much of South Africa, the assumption that environmental degradation can be directly linked to poverty means that an intervention programme which focuses on poverty relief is expected to yield environmental benefits.

Source: Department of Environmental Affairs (NRM), 2013i

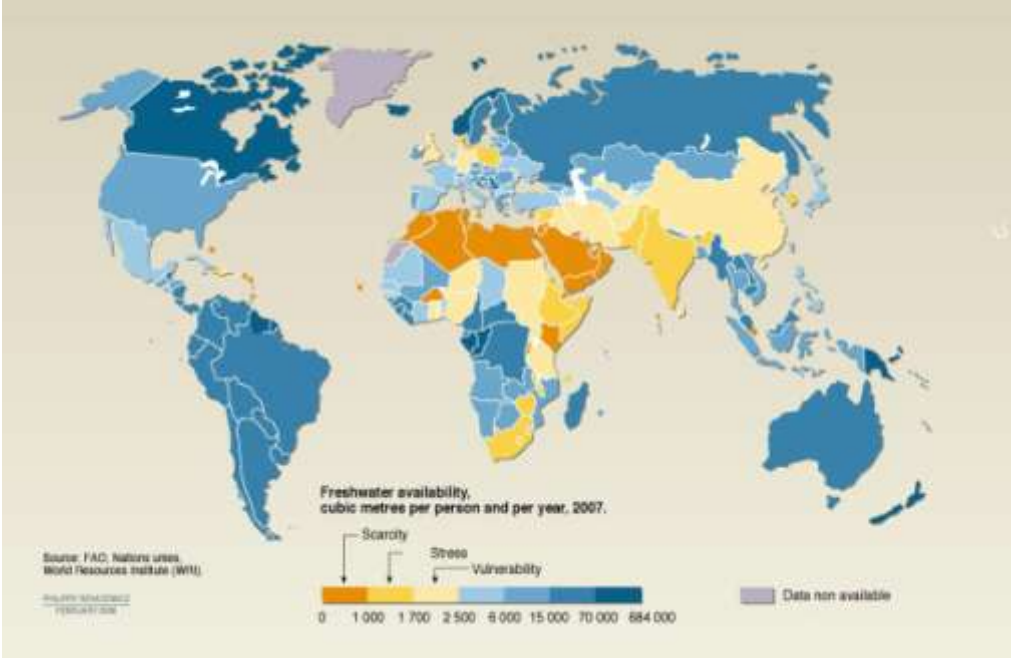
2.2 Geographical context: water scarcity

South Africa is situated at the southern tip of Africa, with a land area of 1.2 million square kilometres. It has an extremely diverse geography and extensive management needs for key environmental resources, including land, freshwater, marine and coastal resources, forests and woodlands, and wildlife. South Africa is blessed with rich biodiversity that is second to none internationally – but this requires the country to effectively manage, protect and conserve its valuable assets. The coastline stretches 2,798 kilometres[2] from a desert border with Namibia, down the cold Atlantic Coast to Cape Agulhas, the southernmost tip of Africa, then along the green hills and wide beaches on the coast of the Indian Ocean, to the subtropical Mozambican border (DEA, 2012a).

[2] Based on the World Factbook methodology. The World Resources Institute methodology results in a length of 3,751 km.

These points are illustrated through the map below (Figure 1) which shows South Africa's freshwater availability being classified as stressed (or marginally better off than complete scarcity).

Figure 1: Global water stress and scarcity



Source: United Nations Environment Programme (http://www.unep.org/dewa/vitalwater/article69.html)

South Africa is a semi-arid and water scarce country, with average precipitation of approximately 500mm per annum, well below the world average of approximately 860mm per year. Only 9% of that rainfall is converted to river runoff (CSIR, Accessed 29 July 2014, www.sarva.org.za/k2c/information/water.php). Rainfall displays a distinct decreasing trend from east to west and is highly variable within and between years with recurrent droughts. This results in highly variable river levels, dam storage and groundwater storage over time.

The majority of catchments in South Africa (12 of 19) use more water than is available on an annual basis. In 2004, 98% of South Africa's surface water yield, as well as 41% of the annual usable potential of groundwater, was fully allocated. This implies that South Africa's total water surplus (or unutilised water yield) is only 1.4% of the country's total water supply. DWAF's baseline scenario for 2025 is that South Africa as a whole is likely to have a water deficit of approximately 1.7%. With a growing population, water scarcity is a huge challenge. In addition, this situation is expected to be exacerbated with predictions of higher temperatures and lower rainfall due to climate change (Blignaut *et al*, 2007).

The amount of surplus water available for utilisation of any kind is therefore declining fast, and water resource and supply management is becoming more difficult. This emphasises the need to find innovative ways to augment the country's water supply, such as the clearing of invasive alien plant species.

2.3 Policy context

The new Constitution, adopted in 1996, introduced a rights-based approach to governance, and enshrined environmental rights and justice in the values guiding environmental policy. Sustainable use of the environment was emphasised as the key overarching principle governing environmental decisions. Section 24 of the Constitution states that:

"…Everyone has the right: to an environment that is not harmful to their health or well-being, and to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that prevent pollution and ecological degradation, promote conservation, and secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development…" (RSA, 1996).

Government is required in terms of the Constitution, through reasonable legislative and other measures, to promote and advance this right. In terms of the Constitution, environmental management in South Africa is a concurrent cross-cutting function across all spheres of government and sectors. Whilst there is a dedicated department for Environmental Affairs, other national departments, provinces and municipalities have functions that implicitly impose environmental responsibility on them.

Since 1994, there has been a substantive repositioning of environmental management within government, from a focus on conservation and tourism, to one that promotes the broad integrated environmental management approach. This approach takes into account the need to balance social, economic and environmental issues in order to advance sustainable development. Consequently, the relationship between environmental degradation and poverty is clearly articulated, and there is a high degree of policy coherence around the importance of sustainable development (Republic of South Africa (the Presidency), 2013).

2.4 Social, political and economic context: from the RDP to the EPWP

During 1994, as part of an ongoing transformation process, the South African government initiated a number of strategies aimed at addressing economic and social issues that would improve the living conditions of all South Africans. This included the national Reconstruction and Development Programme (RDP) and later, the macro-economic policy of Growth, Employment and Redistribution (GEAR). The RDP championed the idea of an integrated approach to poverty eradication, economic growth and transformation of the state, within which environmental policies are located (Republic of South Africa (the Presidency), 2013).

The development of the individual environmental programmes occurred within a broader national approach to development and poverty alleviation. The introduction of the RDP in 1995 provided both the social rationale and funding for the original Working for Water (WfW) programme, located within the former Department of Water Affairs and Forestry (DWAF).

The RDP programme has since been absorbed into the various implementing government departments and funding is channeled through National Treasury to the sector departments, earmarked for poverty relief projects and programmes throughout the country, including those with an environmental focus.

The environmental programmes developed within the Department of Environmental Affairs (formerly twinned with Tourism and known as DEAT) have occurred primarily within the framework of a national Poverty Relief Programme (PRP) launched in 1999/2000. In 2003, the DEAT was nominated to lead the Environmental and Culture sector of the national Expanded Public Works Programme (EPWP), coordinated by the national Department of Public Works (DPW). Specifically, the EPWP is an active labour market programme, commissioned by National Government, which sought to draw significant numbers of unemployed persons into the productive sector of the economy by using government expenditure to provide employment opportunities and training, gaining skills while they work and increasing their capacity to earn an income[3].

The DEA environmental PRP was re-launched as the Social Responsibility Programme (SRP) in 2004 under the auspices of the EPWP, later renamed the Environmental Protection and Infrastructure Programme (EPIP) since 2009. EPIP focuses on alleviating poverty through a number of interventions implemented in communities to uplift households, especially those headed by women, while empowering beneficiaries to participate in the mainstream economy in a manner that addresses the environmental management challenges facing the country.

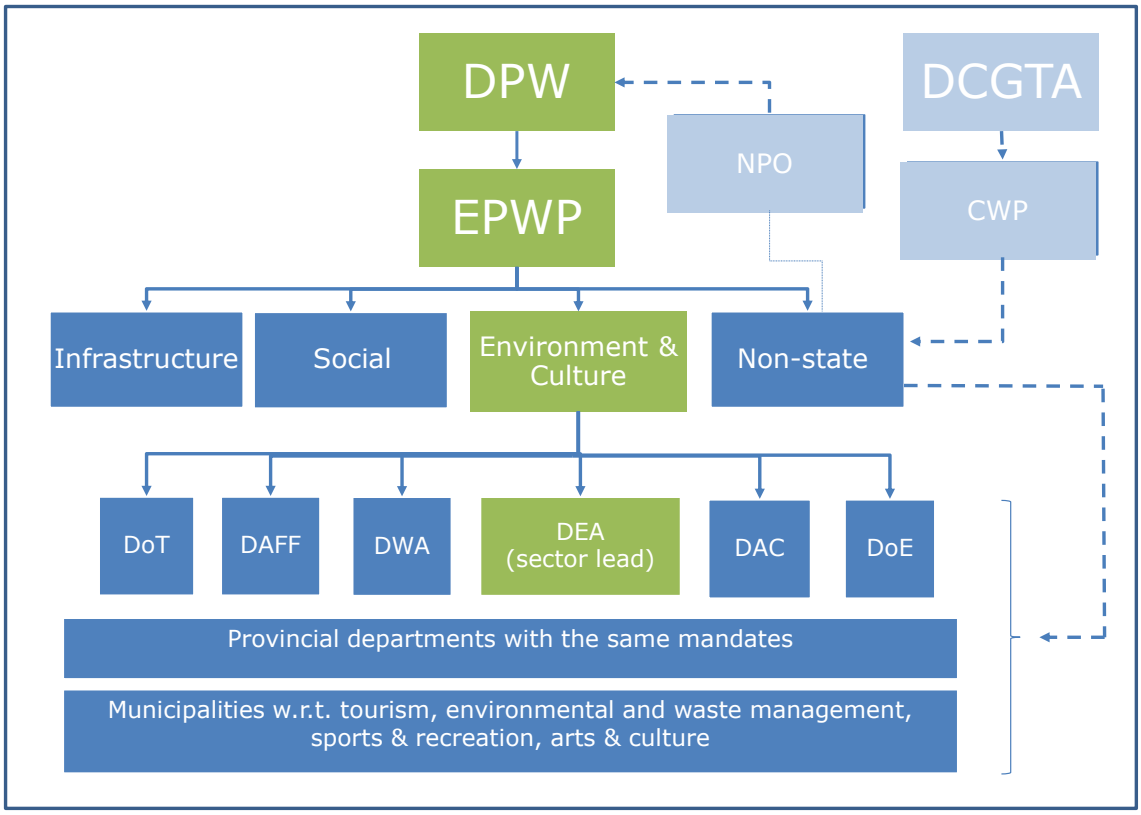
Under the broader EPWP structure, the DEA's Environmental Programmes fall within the Environment and Culture Sector, one of four work sectors identified by the EPWP (see Figure 2 below). This sector is the responsibility of the DEA, working cooperatively with the Department of Water Affairs (DWA), Department of Agriculture, Forestry and Fisheries (DAFF), Department of Transport (DoT), Department of Energy (DoE) and the Department of Arts and Culture (DAC).

EPWP projects in this sector generally involve the employment of people on projects to improve their local surroundings through the provision of a clean and healthy environment. The other EPWP sectors include Infrastructure, Social and the most recently added, the Non-State sector[4].

[3] Expanded Public Works Programme, Draft Sector Plan.

[4] A related but separately coordinated programme is that of the Community Works Programme (CWP) which is located in the Department of Co-operative Governance and Traditional Affairs (DCGTA). It is run through non-profit organisations (NPOs) and comprises a wage subsidy, creating work opportunities under the Non-State sector.

Figure 2: EPWP Contributing sector departments and agencies



Source: Authors recreation based on EPWP Environment and Cluster information.

2.5 Administrative context of the Environmental Programmes

2.5.1 Department of Environmental Affairs (DEA)

The DEA is mandated by Parliament , in terms of Section 24 of the Constitution "to protect, conserve and enhance (South Africa's) environment, natural and heritage assets and resources"[5] whilst contributing to the country's sustainable development, green and inclusive economic growth.

As shown in figure 2 above, the DEA is the lead department in the implementation of the EPWP in the Environment and Culture sector. The twinning of environmental and economic goals is central to the DEA, expressed in the following strategic goals for the department:

- Environmental assets conserved, valued, sustainably used, protected and continually enhanced.
- Enhanced socio-economic benefits and employment creation achieved for the present and future generations from a healthy environment.

[5] (DEA's strategic objectives); DEA Website; Available at: http://www.environment.gov.za/ [Accessed on 2 August 2014]

The actual implementation of the EPWP programmes within the DEA is undertaken by Branch 6: Environmental Programmes (EP). The EP Branch thus has three overarching strategic objectives:

1. Improving socio-economic benefits within the environmental sector;
2. Ensuring ecosystem services are restored and maintained;
3. Providing an improved environmental contribution towards national sustainable development.

The strategic objectives relevant to the Environmental Programmes are elaborated in the form of objective statements and multiple key performance indicators (KPIs) which correspond with each of the strategic objectives. These are reflected in the table below.

Table 2: Environmental Programmes Branch strategic objectives and KPIs

Strategic Objective	**Objective statement**	**Key performance indicators**
1. Improved socio-economic benefits within the environmental sector	Contribute to sustainable development, livelihoods, green and inclusive economic growth through facilitating skills development, employment creation and infrastructure development	a. Number of Full Time Equivalents (FTEs) created
		b. Number of work opportunities created
		c. Percentage of targeted beneficiaries benefiting from projects under implementation
2. Ecosystem services restored and maintained	Restoration and maintenance of vegetation structure and function in order to contribute to ecosystem services	d. Number of wetlands under rehabilitation
		e. Number of hectares of invasive alien plants treated/cleared
		f. Area (ha) of land restored and rehabilitated
		g. Number of Kilometres of accessible coastline cleaned
		h. Number of fire suppressed

Source: Department of Environmental Affairs, 2013a

3 The development, design, implementation and evaluation of the Environmental Programmes

To capture the evolution of the EP in South Africa, one has to begin with an account of the Working for Water programme. This provides the backdrop for the political success of the environmental programmes.

3.1 The evolution of the Working for Water programme

3.1.1 The history of invasive alien plants in South Africa prior to 1994

Terrestrial ecosystems in South Africa include savannas, grasslands, arid shrublands, Mediterranean-climate shrublands (fynbos), deserts and forests, all of which harbour well-established populations of invasive species. Many of these ecosystems have been significantly transformed through invasion by alien woody plants. These include pines (Pinus species) and hakeas (Hakea species) in fynbos shrublands, Australian wattles (Acacia species) and eucalyptus (notably Eucalyptus camaldulensis) in riparian areas, and mesquite (hybrids of several species of Prosopis) in arid areas. Many of these species have been extensively propagated, widely distributed, are predisposed to local environmental conditions, and have been in the country for a long time (up to 300 years in some cases).

Invasive alien plants (IAPs) are introduced into an environment where their natural enemies do not occur. They are therefore able to grow faster, mature earlier, and produce many more seeds than indigenous species. They are able to out-compete indigenous vegetation, resulting in the replacement of the natural vegetation with dense infestations of invasive alien trees that impact negatively on water resources and on the ecological integrity of ecosystem in South Africa.

Of equal concern to South Africa, IAPs invade grazing lands, reducing their value to stock farmers, by replacing palatable plants - in a country where raising livestock on natural pastures is still the most widespread form of land-use. It is estimated that in South Africa 9.6 million ha of DWAF priority licensing catchment areas and 7.5 million ha of land-based conservation priority areas are infested with IAPs. They invade at an annual rate of 5% doubling their impact every 15 years[6]. IAPs also increase the intensity of fires and exacerbate environmental damage due to providing a higher amount of flammable material, or fuel load, than indigenous vegetation (Marais, 2004; van Wilgen *et al*, 2008).

The negative impact of invasive alien species was noticed early on in South Africa. In some areas, where pines and gums had intentionally been planted in groves in the 1860's, it was noticed anecdotally by 1909 that streamflow had been reduced as a result of the growth and spread of these rapidly spreading IAPs in the catchment area (Marais, 2004). Attempts were made as early as the 1930's to use active mechanical control of invasive species.

Most attempts at controlling IAPs were ad hoc and largely unsuccessful. The first successful control programmes were introduced in the 1970s and 1980s, in the fynbos regions of South Africa. These programmes were aimed largely at clearing watershed areas of invasive pines, hakeas and wattles, and they involved the

[6] Common Ground evaluation, 2003.

mapping of invasive plants, and scheduling mechanical clearing in conjunction with prescribed burning. The introduction of these carefully planned operations had the desired effect of making considerable progress towards achieving clearing targets. However the momentum of co-ordinated clearing programmes declined drastically in the late 1980s, and invasive alien plant control programs fell behind, and cleared areas were under threat of re-invasion (van Wilgen *et al*, 2010).

3.1.2 Growing recognition of the impact of invasive alien plants on water supply (post 1994)

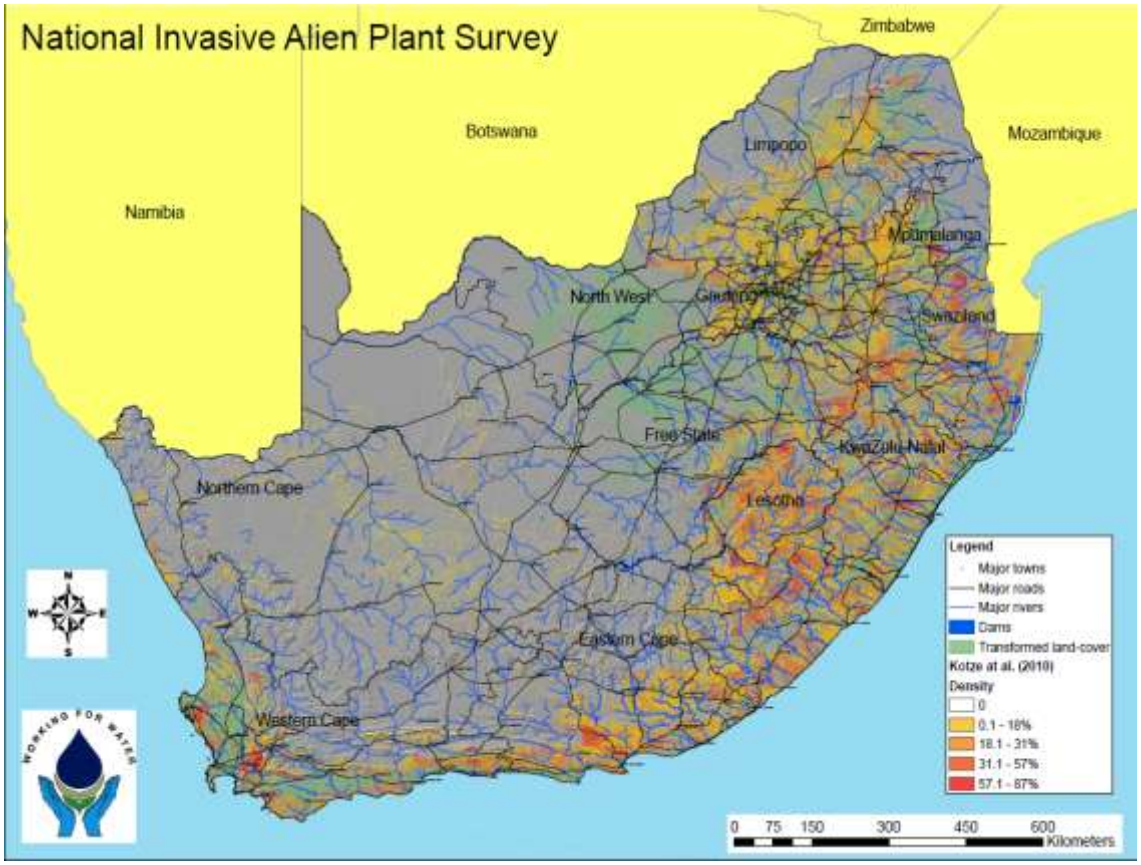
Given South Africa's water scarcity, water is recognised as a limiting factor to development (Scholes, 2001, in Blignaut *et al*, 2007). Historically, water resource managers in South Africa had met rising water demands through the establishment of a complex and costly system of engineering supply-side solutions. It was recognised that land-use management activities, such as reducing the incidence of alien plants, reversing the degradation of wetlands, and addressing overgrazing, would all help to improve the amount of available water (Blignaut *et al*, 2007).

Numerous studies have confirmed that IAPs lead to an undesirable reduction of streamflow and water yield. The level of streamflow reduction is linked to the vegetation type and the density thereof. Research has shown that there is an inverse correlation between runoff (or streamflow) and plant biomass loads (Blignaut *et al*, 2007; Le Maitre *et al*, 1996; Versfeld *et al*, 1998).

Depending on the use of the water and the marginal value applied, the economic value of the water being lost in mountain catchments and riparian zones alone, was estimated at between R526 million and R2.6 billion per annum in 10 stressed water catchments. Should the spread of the invasive aliens not be controlled, the impact on the economy is likely to be between R1.95 billion and R9.6 billion (Blignaut et al, 2008c).

The fact that many invasive species are relatively new arrivals also suggests strongly that the number of invasive species, and therefore the level of impacts, is set to grow (van Wilgen *et al*, 2010). Failure to manage invasive alien plants would consequently lead to a growing water shortage in the future. Cullis *et al* (2007) concluded that potential water yield losses could increase from the current 4% of utilisable water to more than 16% of registered water use if invasive alien plants in mountain catchments and riparian areas are left unchecked.

Figure 3: Scale of alien plant species invasion in South Africa (2010)



Source: Department of Environmental Affairs (NRM), 2013i

3.1.3 The twinning of social and ecological objectives: The origins of the Working for Water Programme

The Working for Water (WfW) programme was initiated in 1995 in response to the realisation and gravity of the threat that alien plants posed to water supply. Shortly after the first democratic elections, the idea of the programme was presented to the then Minister of Water Affairs and Forestry Prof. Kader Asmal in 1995 by a group of natural resource managers and scientists. The idea was to address two immediate challenges with one intervention: first, the effect of invasive alien plants on the country's scarce water resources was highlighted; second, was the potential for job creation and economic empowerment through the clearing of these invasive plants, particularly in underdeveloped rural areas. (Turpie, Marais & Blignaut, 2008) It was the latter benefit that has been key to the political success of the programme over the past 20 years.

A large inter-departmental programme was initiated in 1995 with a starting budget of R25 million to address the problem of invasive alien plants in a holistic way (van Wilgen *et al*, 2002). The programme was named "Working for Water", to capture the dual goals of conserving an important ecosystem service (water), while at the same time providing employment opportunities for the rural poor. The core objective of the Programme is to prevent and control invading alien plants and to optimise the potential use of natural resources, through a process of economic empowerment and transformation. In so doing it is intended to leave a legacy of

social equity and legislative, institutional and technical capacity (Marias, 2004; van Wilgen *et al*, 2010).

The budget was successfully spent by the end of the financial year, leading to the allocation of further funding. Due to the ability of the WfW Programme to unlock significant job opportunities while meeting an environmental objective, the WfW programme rapidly became the flagship of the government's natural resource-based poverty-relief programmes (van Wilgen *et al*, 2002).

3.2 Building on the WfW legacy: Environmental Programmes in South Africa in 2014

In South Africa the environmental public programmes are currently undertaken by the Department of Environmental Affairs' (DEA) Environmental Programmes Branch. The branch consists of three Chief Directorates, two of which are responsible for Natural Resource Management (NRM) and the Environmental Protection and Infrastructure Programme (EPIP)[7]. There have been several institutional and programmatic changes since the original WfW sub-programme first began in the mid 1990's, when it was housed in the former Department of Water Affairs and Forestry (DWAF). Since that time, the scope of the DWAF sub-programmes has been expanded into the current NRM, and the socio-economic component has been formalised as part of a national Expanded Public Works Programme (EPWP). In addition, the Working for Water and other associated sub-programmes under NRM have found a new institutional home[8] in the DEA alongside the existing EPIP projects, as of 2011.

All the Environmental Programmes' Branch sub-programmes operate to meet the employment prescripts of South Africa's Expanded Public Works Programme (EPWP). This implies that labour-intensive practices are employed in the implementation of the sub-programmes with the further requirement that the sub-programmes are targeted at the unemployed, youth, women, people with disabilities as well as small and medium-enterprises (SMMEs).

Natural Resource Management

NRM has its origins in the original Working for Water (WfW) sub-programme in what was then the Department of Water Affairs and Forestry (DWAF) as has been noted above. It has since evolved through the progressive inclusion of new methods, additional targeted ecosystems and the promotion of value added industries.

The Natural Resource Management (NRM) programme vision, of which WfW is the forerunner, is that it generates a "…prosperous and equitable society living in harmony with [its] natural resources" (Department of Environmental Affairs, 2013b: 1). In facilitating the achievement of this vision NRM aims to provide "…leadership in environmental management, conservation and protection towards sustainability for the benefit of South Africans and the global community" (ibid). At

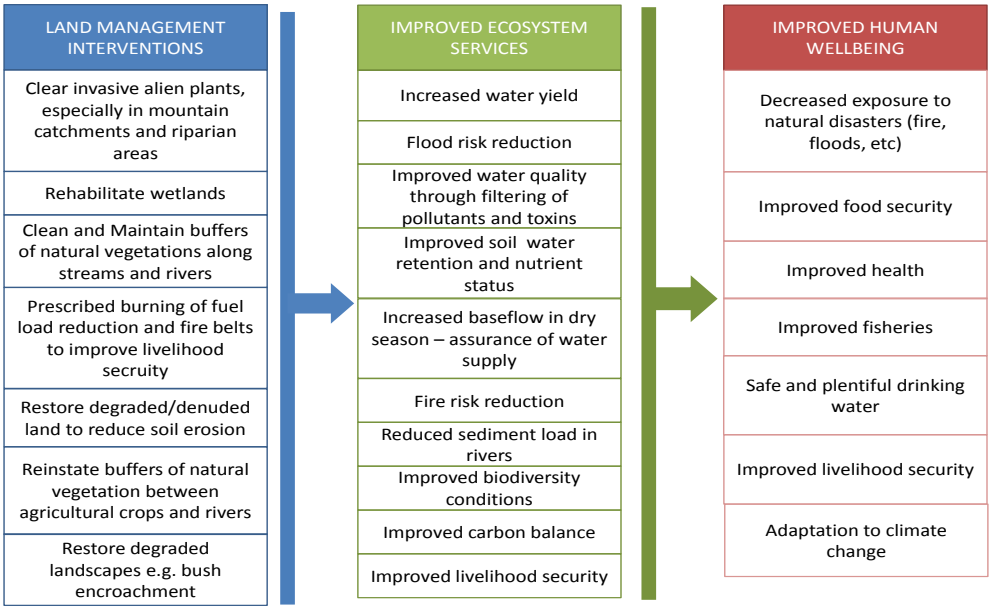
[7] The third Chief Directorate is responsible for Information Management and Sector Coordination.

[8] The shift of NRM into the DEA was part of a broader realignment of many of the national departments, which included the splitting of Tourism from DEAT into its own department, and the move of the forestry function out of Water Affairs, into the new Department of Agriculture, Forestry and Fisheries (DAFF).

a high level, NRM interventions are intended to contribute to South Africa's achievement of the Millennium Ecosystem Goals as displayed below (ibid).

Figure 4: Millennium Ecosystem Goals

Source: Department of Environmental Affairs, 2013b



NRM sub-programmes address threats to the productive use of land and water as well as the functioning of natural systems, including invasive alien species, wild fires and land degradation. The main flagship programme is Working for Water, which is aimed at controlling invasive alien plants with the associated benefit of improving runoff from catchments. Other sub-programmes include: Working on Fire, focused on integrated veld and forest fire management programme, as around 60% of South Africa's biomes are fire prone; Working for Wetlands dealing with wetland rehabilitation; Working for Ecosystems (land rehabilitation in upper catchments and riparian zones); and Working for Forests (replacing areas of invasive alien trees with commercially or socially beneficial non-invasive semi-natural and natural forests). Additional spin-off programmes (Working for Energy [biomass-derived] and the Eco-Furniture Programme) have been developed to use the biomass harvested through these projects to generate additional funds, and therefore create incentives for continuing conservation efforts.

Environmental Protection and Infrastructure Programme

Since 1999, the Department of Environmental Affairs (and Tourism, then) has been implementing programmes aimed at conserving natural assets and protecting the environment. Over time this programme has evolved and has also grown from a budget of R28 million in the 1999/2000 financial year to more than R817 million in 2013/14. The programme has evolved and changed names from Poverty Relief Programme to Social Responsibility Programme and it is now called the Environmental Protection and Infrastructure Programme (EPIP) (DEA, 2013c: 1).

The original EPIP sub-programmes focused on waste, coasts, rehabilitation of communal land and provincial conservation areas has since expanded to include new sub-programmes, notably Wildlife Economy and the Youth Environmental Service.

Specific EPIP goals include:

- Better Environmental Management practices
- Job creation
- Skills development
- Development of Small Medium and Micro Enterprises (SMMEs).

EPIP includes sub-programmes which support municipalities in the fulfilment of environmental responsibilities including Working on Waste (waste management including waste facilities); Greening & Open Space Management (development of community parks in urban areas) and Working for the Coast (a range of activities to improve access and biodiversity along the coastal zone). The EPIP also supports activities which are largely provincial through the sub-programmes: People & Parks, focused on increased natural biodiversity in conservation areas and improved tourist access; Working for Land (which has a greater focus on rehabilitation of peri-urban land compared to the Working for Ecosystems sub-programme) and Wildlife Economy (promoting sustainable usage and harvesting of wildlife fauna & flora).

3.3 Current Sub-Programme overview

These sub-programmes are discussed in more detail in the following sections, which are structured as follows:

1. Working for Water and its off-shoot programmes, namely Working for Wetlands, Working for Forests and Working on Fire. Although Working for the Coast was developed under EPIP, it is best aligned here.
2. Working for Ecosystems and the similar EPIP Working for Land sub-programme.
3. People & Parks and Wildlife Economy.
4. The value-added off-shoots, namely Working for Energy (the use of biomass for energy) and the Eco-furniture sub-programme (the use of biomass for the production of furniture).
5. The municipal grouping: Working on Waste, and the (urban) Greening and Open Space Management and sub-programmes.
6. Youth Environmental Service.

As can be seen with the last 3 groupings in particular, they are not well aligned with the traditional concepts of biodiversity and conservation. They do, however, relate to the education of future environmental leaders, and improving the sustainability of urban environments, particularly in the context of low capacity municipalities. With the exception of the value-added sub-programmes, the following table gives a brief overview of the core objectives of the sub-programmes.

Table 3: Core objectives of the NRM and EPIP sub-programmes

INVASIVE CONTROL AND ENVIRONMENTAL INTEGRITY
Working for Water (NRM)
• Aims to improve the integrity of natural resources by preventing the introduction of new invasive species.
• Ensure early detection of and rapid responses dealing with emerging invasive alien species.

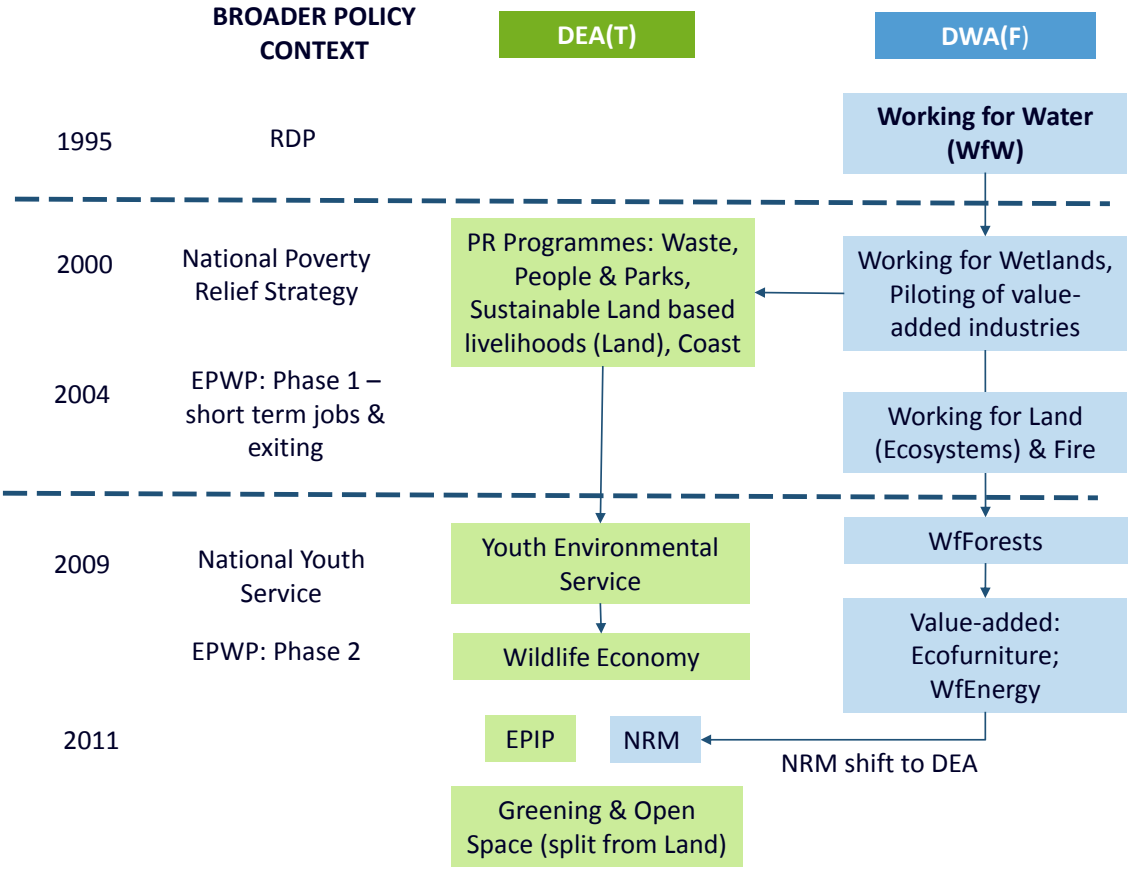
• Management of the impact of established invasive alien species.
Working for Wetlands (NRM)
• Aims to protect, rehabilitate and enhance the sustainable use of South Africa's wetlands through interventions, incentives, disincentives, advocacy and research based on co-operative governance and partnerships.
Working for Forests (NRM)
• Promote conversion of invading alien plant stands, and degraded marginal state forests, into utilizable resources for meeting basic community needs as well as sustainable forestry land-use practices.
• Seeks to capitalize upon the invasive alien species in the short-term, but move towards species that will replace the invasive monoculture stands with a diversity of species that will be compatible with climate change impacts, including the risk of diseases; this will promote biodiversity and be less vulnerable to wild fires, and which offer beneficiaries scope for sustainable livelihoods and optimal resources from the land-use practices.
• Promote the conservation of indigenous forests, and the sustainable use of the resources and ecosystem services provided by these forests.
Working on Fire (NRM)
• Aims to enhance the sustainability and protection of life, livelihoods, ecosystem services, and natural processes through integrated fire management.
Working for the Coast (EPIP)
• Protect and conserve the coastal environment.
• Equitable access to coastal public property.
IMPROVING LAND PRODUCTIVITY FOR BOTH ECOSYSTEM SERVICES AND RURAL LIVELIHOODS
Working for Ecosystems (NRM)
• Aims to restore the composition, structure and function of degraded land, thereby enhancing ecosystem functioning, such as carbon sequestration, water regulation and purification.
• Improve the sustainability of livelihoods and productive potential of land.
• Promote economic empowerment in rural areas.
• Improve natural species diversity and landscape and catchment stability and resilience.
• Promote the development of a market for ecosystem services.
Working for Land (EPIP)
• Restore and rehabilitate degraded land, with a peri-urban focus.
• Encourage biodiversity conservation.
• Curtail bush encroachment.
• Mitigate loss of top soil which will enhance ecological integrity of the ecosystem.
• Encourage better land use practices.
• Promote environmental education and awareness.
NATURAL RESERVES AND PROTECTED AREAS
People and Parks (EPIP)
• Conserve, protect and mitigate threats to biodiversity.
• Fair access and equitable sharing of benefits from biological resource promoted.
• Sustainable use and regulation of biological resources.
• Improved socio-economic benefits within the environmental sector.

Wildlife Economy *(including activities on private reserves)* ***(EPIP)***
• Fair access and equitable sharing of benefits arising from bio prospecting involving indigenous biological resources promoted.
• Sustainable use and regulation of biological resources.
• Improved socio-economic benefits within the environmental sector.
MUNICIPAL SECTOR
Working on Waste (EPIP)
• Create and support mechanisms for the protection of environmental quality.
• Create sustainable livelihoods through recycling of waste (waste collection & minimization).
• Support the use of environmentally friendly waste disposal technology.
• Promote environmental education and awareness to the communities especially as they are the main waste generators.
Greening and Open Space Management (EPIP)
• Restore, enhance and rehabilitate open spaces.
• Maximize measures towards pollution mitigation.
• Improve climate change adaptation through minimization of biodiversity loss.
• Encourage use of greener technologies to mitigate against environmental degradation.
EDUCATION AND TRAINING
Youth Environmental Service (EPIP)
• Strengthen the capabilities of young people to realize their potential through skills and personal development.
• Strengthen the culture of patriotic citizenship through rendering of service in disadvantaged communities.
• Ensure that youth play a part in the development of the country.
• Provide environmental education and awareness in schools and communities.
• Contribute to conservation and protection of the environment.

Source: Department of Environmental Affairs, 2013a, 2013b and 2013c

The environmental programmes came into effect at different points in time starting with the Working for Water programme in 1996. With the evolution of the broader policy environment, particularly a pronounced emphasis on poverty relief, the necessity for programmes which served both environmental and socio-economic needs, presented themselves. The first EPIP programmes were introduced in 2000. In 2004, the first phase of the Expanded Public Works Programme (EPWP) came into effect and with it the entrenchment of programmes which optimise on short-term job creation and the facilitation of exit opportunities into the broader labour market. Major policy developments thereafter included the introduction of the National Youth Service and revision of EPWP to a focus on sustainable employment creation after 2009. By 2011, all of the current environmental sub-programmes had come into effect, some in pilot form (such as the value-added NRM sub-programmes). At this point NRM moved out of DWAF into the DEA to merge with EPIP under the newly formed, EP branch. The only sub-programme which was then created, as a specifically urban off-shoot of the existing EPIP Working for Land sub-programme, was Greening and Open Space Management.

Figure 5: Timeline of inception of the environmental sub-programmes



Source: Authors

3.3.1 Working for Water

At the outset the objectives underpinning the Working for Water programme were three-fold: controlling invasive alien plants, improving runoff and providing social improvement for communities who were disadvantaged by Apartheid (van Wilgen *et al*, 2002: 6). More succinctly, the long-term aim and vision of the programme was:

"To clear alien invasive plants through an integrated approach of mechanical, biological and chemical control on state land as well as land in private ownership in areas of importance for water conservation to such an extent that relative infestation levels can be maintained at levels less than 0.1%, ensuring optimum sustainable water runoff."

(Department of Water Affairs and Forestry, 1996: 1)

The overall aim of the WfW sub-programme is captured in the sub-programme summary shown in Table 3. DEA, working together with its sister department in the Ministry of Water and Environment Affairs, is the responsible authority taking water resource and biodiversity outcomes into consideration. The beneficiaries of the sub-programme also include private land owners who assume co-responsibility through their role as the custodian of the land they own.

Source: Department of Environmental Affairs (NRM), 2013i

The WfW sub-programme originated in order to achieve the desired outcome of 'increased indigenous biodiversity through decreased density of invasive aliens'[9]. It has the related outcomes of 'increased runoff and improved water quality' and 'increased availability of land and water bodies for productive and recreational use'. In order to achieve these outcomes the original output was 'standard' clearing of invasive aliens through mechanical removal of woody plants'. The design of the sub-programme, however, has evolved to include the use of bio-control[10] methods which are increasingly supplementing mechanical methods, and the recent introduction on land user incentives[11], which are intended to get buy-in from land owners who make a contribution to the work being done on their land.

South Africa has a long history in biological control, dating back to 1913 (DEA, 2012b). Bio-control and land user incentives came about because the same outcome could be achieved in a more cost effective manner and with greater institutional simplicity than conventional mechanical means of invasive alien control. The WfW invasive aliens management programme is also supported through bio-security initiatives, which is part of a suite of internationally accepted methods for controlling the introduction of invasive alien species into the country.

Multiple benefits associated with the clearing of invasive alien plans were envisaged including the:

- Potential to increase stream flow along rivers;
- Reduction in their destructive impact on water quality, soil health, estuary systems, human health and food security;
- Reduction in the risk of soil erosion and the risk of wild fires (Marais, 1998: 92).

In addition, through its active training and employment elements it was aimed at promoting social equity for economically marginalized people (van Wilgen *et al*,

[9] Note that the wording is that of the authors, taken from the WfW description above.

[10] Bio-control, or biological control, is the use of biological agents such as insects, mites or fungi to control invasive alien plants. These agents are natural enemies of the invasive alien plants, and therefore through impacts such as limiting their spread by making plants sterile or reducing seed production.

[11] This is explored more in Section 2.5.1 below.

2002). These social benefits manifest themselves in the form of four core elements to the sub-programme including the:

1. Development of entrepreneurial skills[12];
2. Provision of training[13];
3. Addressing gender imbalances[14];
4. Re-integration of ex-offenders[15].

3.3.2 Working for Wetlands

Wetlands are undoubtedly linked to water security, poverty alleviation and greenhouse gas emissions. Rehabilitated wetlands can reduce both flood and drought impacts, and purify water. Wetlands containing peat (which account for 10% of South Africa's wetlands) are one of the most efficient natural land-based carbon sinks. By providing highly productive agricultural land for grazing, water, fish, fibre and natural medicines, wetlands underpin the health and livelihoods of many rural communities (DEA, 2012b).

According to local research, up to 60% of South Africa's wetlands have already been lost or severely degraded. Since 2004, more than 800 wetlands have been rehabilitated at a cost of about R500 million. Working for Wetlands has created 15,000 job opportunities since 2004, mostly for people from the most vulnerable and marginalised groups (ibid).

The NRM strategic overview (DEA, 2013b: 14) states the overall aim of the sub-programme as follows:

> *"Working for Wetlands protects, rehabilitates and enhances the sustainable use of South Africa's wetlands through interventions through incentives, disincentives, advocacy and research, based on co-operative governance and partnerships."*

[12] This included the introduction of a contractor scheme whereby contractor development is undertaken so that beneficiaries (workers) progress from being paid on a daily-wage basis, to being employed as contractors (appointed without a tendering process) and finally to being appointed as independent contractors through a tendering process (Magadlela and Mdweke, 2004: 95).

[13] This has taken shape in the form of training in work-related activities (such as the development of skills in machine and herbicide use, and worker safety issues), training in health (particularly focused on HIV/AIDS), and contractor development (ibid).

[14] This entails ensuring that at least 60% of the wages are earned by women (ibid).

[15] Facilitating the re-socialisation of former prison inmates into society and into the labour market (ibid).


Source: Department of Environmental Affairs (NRM), 2013i

Case study of a Working for Wetlands project

A Working for Wetlands project was undertaken at the Manalana Wetland, near Bushbuckridge, Mpumalanga, South Africa. The wetland was severely degraded by erosion which threatened to consume the entire system if left unchecked. The wetland is a key resource to the approximately 100 small-scale farmers in the surrounding area (98 of whom are female).

The wetland was reported to be supporting 70% of the local people with 25% of them largely dependent on it as a key source of food and income. The importance of the wetland thus presented itself in the form of it being a key safety-net, particularly for the poor, contributing 40% of locally grown food supplies. The Working for Wetlands intervention helped stabilise erosion and improved the wetland's ability to provide beneficial ecosystem services.

(Department of Environmental Affairs, 2012: 13)

Working for Wetlands began in 2003, and is aligned with the WfW sub-programme as it applies modifications to land and aquatic ecosystems through clearing and planting activities, with embankments and fencing included. However, the Working for Wetlands sub-programme does introduce a new output in the form of facilitating community engagement around the use of wetlands. Further, the sub-programme uses a different set of technical information relating to the condition of wetlands to assist with prioritising projects. DEA is the national agency responsible for wetlands, but have until recently delegated this responsibility to the South African National Biodiversity Institute (Sanbi).

3.3.3 Working for Forests

Working for Forests (WfF) began as an offshoot of the WfW sub-programme with the intention of finding new ways to reduce invasive alien tree densities through a combination of mechanical clearing and planting with species that have commercial and social value and will eventually out-compete invasives. The single output is closely linked to WfW primary outputs and represents a consistent expansion of the sub-programme, albeit largely experimental at this stage.

Source: Department of Environmental Affairs (NRM), 2013i

It is seen as a cost effective way of reducing invasive alien density, while at the same time providing benefits to local communities through, for example, making wood available as an energy source and for other purposes. The overall aim of the sub-programme is stated as follows (Department of Environmental Affairs, 2013b: 10):

"WfF promotes the conversion of invading alien plant stands, and degraded (marginal) state forests, into utilizable resources for meeting basic community needs as well as sustainable forestry land-use practices. The [sub-] programme seeks to capitalize upon the invasive alien species in the short-term, but move towards species that will replace the invasive monoculture stands with a diversity of species that will be compatible with climate change impacts, including the risk of diseases; which will promote biodiversity and be less vulnerable to wild fires, and which offer beneficiaries scope for sustainable livelihoods and optimal resources from the land-use practices. The [sub-] programme also promotes the conservation of indigenous forests, and the sustainable use of the resources and ecosystem services provided by these forests."

With regard to the activities, these are limited to a specific approach to dealing with dense stands of invasive alien trees. Strips of land are cleared through the stands of alien species and are then planted with hardy trees with commercial value which, once established, will out-compete the invasives. These species include imported but sterile eucalyptus species and local trees (including yellowwoods).

3.3.4 Working for Ecosystems

Until recently there were two 'Working for Land' sub-programmes, which had developed separately under the NRM and EPIP programmes. The NRM sub-programme has recently been re-named 'Working for Ecosystems', which underscores the different purposes of these two sub-programmes. ***Working for Ecosystems*** is aimed at enhancing ecosystem functioning, focussing on carbon sequestration, reducing erosion, improved water regulation and purification, and has a broad focus on ecosystems services (This can be contrasted with the EPIP Working for Land sub-programme, based on the Convention to Combat Desertification, which is aimed at rehabilitating degraded land to increase its performance in terms of production, thereby promoting improved livelihoods and poverty relief. However, the goals and activities are over-lapping). The overall aim

of this NRM sub-programme is stated as follows, and outlined in Table 3 (Department of Environmental Affairs, 2013b: 8-9):

"The Working for [Ecosystems] [sub-] programme aims to restore the composition, structure and function of degraded land, thereby enhancing ecosystem functioning, such as carbon sequestration, water regulation and purification. In so doing, and by reducing environmental risks, it will improve the sustainability of livelihoods and productive potential of land, and promote economic empowerment in rural areas; improve natural species diversity and landscape and catchment stability and resilience, and promote the development of a market for ecosystem services."

Working for Ecosystems thus involves the modification of ecosystems through clearing and planting activities, with the additional, and substantial, activity of erosion protection. While it is currently a relatively small sub-programme, it is potentially very large, given the scale (4.5 million hectares) of degraded land in the country[16]. It is understood that the Working for Ecosystems sub-programme is intended to focus on upper catchments and riparian zones where the benefits for improved runoff quantity and quality are a key outcome, while Working for Land is focused more on productive land, close to settlements. The outputs and activities for both programmes are much the same: clearing, planting, erosion protection and fencing. While the current sub-programme is relatively modest in scale it has the potential for expansion to a much larger scale.

Source(s): Image 1 – Taken by Leeanne Ezzy in Mills et al, 2009;

Image 2 - Department of Environmental Affairs (NRM), 2013ii

As the first image above shows, to the right of the fence is degraded thicket, the result of over-grazing. All the spekboom has been browsed by goats, exposing the soil to erosion and ultimately leading to the premature death of the remaining trees. On the left is intact spekboom-rich thicket that delivers a wide variety of ecosystem services to humans, such as retaining topsoil, supporting judicious livestock farming and storing carbon (Mills *et al*, 2009).

[16] Telephonic communication with Dr Christo Marais.

Case study of a Working for Ecosystems project

A Working for Ecosystems project, with high returns on investment, is the Subtropical Thicket Restoration Project (STRP), which aims to restore degraded thicket by replanting indigenous spekboom (Portulacaria afra) cuttings. This spekboom carbon farming initiative is a partnership between farmers, communities, government, ecologists, soil scientists, botanists, ecologists and economists in the Eastern Cape and to a lesser extent in parts of the Western Cape Provinces of South Africa.

The aim is to restore large tracts of the nearly 1,4 million hectares of degraded veld which was previously covered with spekboom-rich thicket prior to overgrazing by livestock. The implementing agency, the Gamtoos Irrigation Board (GIB), based in Patensie, is currently overseeing large-scale planting in degraded sites in the Baviaanskloof Nature Reserve, Addo Elephant Park (Darlington Dam) and the Fish River Reserve. To date, over 3000 hectares of degraded veld have been replanted.

South Africa is now ready to sell carbon credits in this project. In addition, the project's benefits range from job creation – with over 300 jobs per year – to reducing silt loads in dams and rivers, greater ecosystem productivity and biodiversity conservation.

The project has been validated and registered through the Verified Carbon Standard and the Climate, Community and Biodiversity Standard, making it a blue-chip carbon market credit.

(Department of Environmental Affairs, 2012: 9)

Source: Department of Environmental Affairs (NRM), 2013iii

3.3.5 Working for Land (EPIP)

While the NRM Working for Ecosystems has many of the same activities, the key difference is that the EPIP ***Working for Land*** sub-programme (formerly known Sustainable Land Based Livelihoods) is informed by the Convention to Combat Desertification, and is aimed at rehabilitating degraded land to increase its performance in terms of production, thereby promoting improved livelihoods. The focus of this sub-programme is therefore on improving land productivity for the surrounding communities, as opposed to areas more remote from human

settlements which chiefly provide ecosystem services (Department of Environmental Affairs, 2013c). Working for Land was one of the original four EPIP sub-programmes or focus areas introduced in 2000 as part of the broader national poverty relief strategy.

This programme recognises that land is central to rural livelihoods, and that rural dependency on natural resources for everything from energy to food can result in over-use and degradation, and undesired outcomes such as overgrazing, soil erosion and deforestation. In trying to prevent these adverse effects, the Working on Land sub programme is focussed on restoring and rehabilitating degraded land, mitigating the loss of top soil, encouraging better land use practices and biodiversity. Actual deliverables range from land and donga (eroded gully) rehabilitation, to tree planting (Department of Environmental Affairs, 2012).

3.3.6 Working on Fire

Launched in 2003 as part of a broader job creation and poverty alleviation programme, ***Working on Fire*** (WoF) is essentially a stand-alone sub-programme which involves fire prevention, detection and suppression as well as coordinating activity. It involves the management of ecosystems through labour intensive measures. It has involved the training and employment of young men and women as veld and forest fire fighters, stationed in 170 teams throughout South Africa.

According to the NRM 2013 strategic overview (Department of Environmental Affairs, 2013b: 13):

"The WoF programme aims to enhance the sustainability and protection of life, livelihoods, ecosystem services and natural processes through integrated fire management. In doing this it has to, develop capabilities and to contribute resources and provide services to Fire Protection Associations, land-management and jurisdictional agencies; the use of fire for the control of invasive alien plants and in natural resource restoration; the provision of resources for the maintenance of natural fire regimes in order to optimize natural biodiversity, processes and ecosystem services; co-ordinating fire management interventions in order to optimize the use of resources; empowering communities affected by fire in order for them to understand the benefits of and potential harm caused by fire; advocating and assisting with the implementation of appropriate land-management strategies; the creation of a platform for fire awareness and education amongst land-users and the general public, and greater awareness of relevant laws, ordinances, by-laws, and compliance among partner groups and local communities. The importance of the use of fire in fire-driven natural systems is a fundamental environmental benefit of the work of this [sub-] programme."

Source: Department of Environmental Affairs (NRM), 2013i

The DEA has taken responsibility for the national coordination of this sub-programme on the assumption that certain types of fire management are of national significance. But a key feature of the sub-programme is that DEA and the implementing agent, the Forest Fire Association (FFA), work cooperatively with other fire-fighting organisations in the country. The relationship with a 'base manager' whom is responsible for fires in a specific locality is therefore central to success. While the FFA is currently run outside of government, the current intention is to reabsorb the implementation function into the DEA in 7 years' time. As a result of the socio-economic objectives, the WoF initiative employs the largest percentage of women fire-fighters in the international fire-fighting community (DEA, 2012b: 11).

3.3.7 People & Parks, and Wildlife Economy

The ***People & Parks*** sub-programme was one of the 4 original sub-programmes introduced in 2000 under the national Poverty Relief Programme, building on the earlier success of WfW. It has been enhanced by the 5th World Parks Congress, held in Durban in 2003, which continued an ongoing global dialogue on the use of conservation benefits to alleviate poverty. It acknowledged that local communities should have the rights, and access to, protected areas. In some cases in South Africa historically protected areas were established at the expense of local communities through displacement and dispossession (DEA, 2012b: 16).

Source: Department of Environmental Affairs (NRM), 2013i

The People & Parks sub-programme promotes community participation, uses social and economic benefits for poverty reduction, engages communities in participatory planning, and promotes access to genetic resources. It has ecosystem enhancement as its primary objective in conservation areas and the creation and rehabilitation of infrastructure in and around protected areas for community beneficiation. It also has a substantial emphasis on buildings, infrastructure and fencing. This is consistent with the infrastructure improvement mandate of the EPIP.

Its outputs include (ibid):

- Restoration of land for conservation purposes.
- Development and upgrading of infrastructure in and around protected areas.
- Development of commercial assets for communities living around parks and protected areas.
- Supporting of ancillary industries and BEE/SMME development initiatives.
- Complimentary to the protected areas, might include laundries, nurseries, erection of fences, etc.

The ***Wildlife Economy*** sub-programme involves investing in infrastructure development and biodiversity conservation associated with wildlife. This is a relatively new focus area, and is unusual in that it focuses on 'economy', albeit one which is largely land based in the form of game farming and associated activities. Another feature of this sub-programme is the wide range of activities included, ranging from direct 'assistance' to emerging game farmers to construction of buildings and infrastructure to promotion of trade and training.

Outputs include game ranching and game breeding facilities; establishing hunting outfitters; venison processing; bio-trade and bio-prospecting; and training of beneficiaries to be environmental monitors (ibid).

Both the People & Parks and Wildlife Economy sub-programmes are aimed at recognising that the protection of natural capital is enhanced by ensuring that the communities who live in environmentally significant areas also see the benefit of sustaining and retaining the natural capital. Tourism and community ownership of tourism facilities are therefore seen as ways of ensuring that local communities see a direct benefit from protecting natural capital.

3.3.8 Working for the Coast

The aim of this sub-programme is to ensure sustainable and equitable maintenance of the coastal environments. This includes both the protection and conservation of coastal environment, and ensuring equitable access to coastal public property. The Working for the Coast programme, begun in 2000, assists in the implementation of the Integrated Coastal Management Act (ICMA) in South Africa. As such, while the programme initially focused on the collection of litter and rehabilitation of dunes, since the promulgation of the act, the programme now also embraces the principles and objects of the act including the demolition of illegal structures (Department of Environmental Affairs, 2012: 20).

A core component of the programme sees an interactive relationship with municipalities and conservation agencies so as to manage the coastline and ensure the sustainable use of the coast's natural resources. Ultimately, the programme aims to maintain a cleaner and safer coastal environment by providing much needed jobs and training for unemployed people in communities adjacent to the coastal zones (ibid).

Source: Department of Environmental Affairs (EPIP), 2013iv

Outputs include providing or improving coastal access, through (Department of Environmental Affairs, 2013c):

- the construction of boardwalks;
- coastal cleaning (removal of waste and marine debris);
- removal of invasive alien vegetation; and;
- rehabilitation of degraded areas (including dunes).

The programme also links to the efforts of other EPIP programmes and/or municipal activities such as street cleaning, greening, waste management and catchment rehabilitation (Department of Environmental Affairs, 2012).

3.3.9 EPIP municipal grouping: Working on Waste and Greening & Open Space Management

The department is also involved in a number of other related sub-programmes with the same socio-economic objectives, but which do not involve biodiversity conservation or ecosystem restoration as such. These include sub-programmes with a focus on municipal functions, where municipal capacity is limited, and include an element of planning support and capacity building for municipalities.

The ***Working on Waste*** sub-programme involves providing support to the creation of waste management infrastructure and initiatives whilst maximizing on socio-economic benefits through job creation, awareness and education. Outputs include the development of landfill sites, construction of waste transfer stations, construction of buy-back/recycling centres, construction material recovery facilities, composting facilities, street cleaning and beautification, and Domestic waste collection.

The ***Greening and Open Space Management*** sub-programme involves the establishment of eco-friendly open spaces that are safe, attractively designed, well managed for the benefit of communities as well as promoting maximum use of alternative energy sources. It is the broadest of the sub-programmes, and is a good example of where socio-economic objectives outweigh any natural capital benefit. Outputs include: the development and rehabilitation of environmentally friendly recreational parks, nurseries, urban tree planting to provide food security and the prevention of soil erosion and degradation. It also comprises the installation of green technology systems such as solar water heaters so as to mitigate the impact of climate change. The programme not only has an impact through temporary employment but also has a lasting impact through the planting of trees and creation of infrastructure in the form of recreational parks. At an overarching scale, the programme entails greening projects which contribute to environmental conservation and protection, as well as the maintenance of cultural resources (DEA, 2012b).

These two sub-programmes are clearly in the municipal realm with EPIP implementing projects based on EPWP principles on behalf of municipalities. They relate to the environmental protection and conservation functions of municipalities and, therefore, there is an obvious alignment with the Environmental Programmes mandate. However, there are only weak linkages with natural capital, and so they are only mentioned here briefly.

3.3.10 Education and Training: Youth Environmental Service

The ***Youth Environmental Service*** (YES) is an environmental skills development sub-programme which directs unemployed youth into activities that benefit their communities. It is not seen to be an employment programme but rather one which

provides young people with opportunities for personal development, accredited training and potential exit opportunities from the sub-programme. The youth trained through the YES programme are sent into communities to help them overcome environmental challenges such as erosion, waste, deforestation, threats to biodiversity sustainability, as well as to complete environmental education and awareness.

Source(s): Image 1- Department of Environmental Affairs (EPIP), 2013iv;

Image 2 - Department of Environmental Affairs (NRM), 2013iii

In essence, the sub-programme is intended to create and implement programmes to ensure youth participation in biodiversity management, and is targeted towards the training and placement of environmental workers. While the need for this is not questioned, it needs to be seen in the broader context of sector capacity building and the responsibility of the Environmental Programmes Branch in relation to other DEA branches (Department of Environmental Affairs, 2012: 23).

3.3.11 Value added projects: Working for Energy and Eco-Furniture

A noteworthy addition to the core sub-programmes is the development of "value-added" labour-intensive projects, which uses the harvested invasive alien plant biomass from the core "Working for" sub-programmes, to generate additional funds and employment stemming from the core programmes. Currently there are two forms of value-adding sub-programmes: Working for Energy and the Eco-Furniture. Uses for harvested biomass since 1995 have included furniture such as eco-coffins, school desks, and furniture for Government agencies (Department of Environmental Affairs, 2012).

Working for Energy

While primarily a pilot initiative as of early 2014, the ***Working for Energy*** (WfE) initiative is being developed in partnership with the Industrial Development Council and with Eskom, the national electricity utility. Estimates are that as much as 2% of South Africa's energy could be generated over a period of 20-25 years using the biomass harvested as part of the core alien clearing sub-programmes. The NRM strategic overview states their aims as follows (Department of Environmental Affairs, 2013b: 11):

"The WfE (Biomass) programme seeks to make optimal use of the biomass cleared through the Working for Water programme, in creating work opportunities to generate energy. The programme will also promote the general use of biomass through biogas digesters, in providing energy and jobs to the rural poor."

The origins of this value-added sub-programme are based on an alignment between the Department of Energy's interest in promoting biomass as an energy source for power generation, and DEA's interest in promoting uses for harvested biomass

which will in turn create an incentive for increased levels of invasive alien species clearing using mechanical means. The Department of Energy is the responsible authority but with responsibility for the pilot falling to the South African National Energy Development Institute (Sanedi), a state-owned entity[17]. At this stage the Working for Energy sub-programme is a pilot initiative and the extent to which it belongs as a sub-programme within DEA in the long term has yet to be determined.

Eco-Furniture

The Eco-Furniture (EF) sub-programme entails establishing factories across the country which uses wood from cleared invasive alien plants to make furniture needed by Government. The NRM strategic overview states their aims as follows (Department of Environmental Affairs, 2013b: 12):

"The EF programme seeks to make optimal use of the biomass cleared through the Working for Water programme, in creating work opportunities to make products that help Government to meet its needs, and notably the pro-poor opportunities within this. The initial focus of the production centres upon factories that will be established across the country (because of the need to spread out the employment benefits; because of the available biomass, and because of transportation costs), with a particular emphasis on the needs of disadvantaged schools, including school desks, benches and other furniture. The programme will build on the range of products that are possible, such as meeting the needs of hospitals, clinics, community centres and other needs, and including the provision of the established Eco-coffins across the country."

Source: Department of Environmental Affairs (NRM), 2013i

It is understood that this sub-programme originated as a South African National Parks (SanParks) programme under their 'corporate responsibility' commitment. DEA has contributed through aligning it with the WfW sub-programme and

[17] The main function of SANEDI is to direct, monitor and conduct applied energy research and development, demonstration and deployment as well to undertake specific measures to promote the uptake of Green Energy and Energy Efficiency in South Africa.

providing funding.[18] The objectives of the sub-programme are partly related to the creation of incentives for invasive alien timber use (although the quantities are likely to be very small in relation to the national total of timber from this source). They are also related to the promotion of manufacturing with the specified assumption that this can be done at lower cost by the public sector. The Eco-Furniture sub-programme is currently implemented through a single contract with SanParks who run each of the furniture factories as part of their corporate responsibility programme. The programme recently received a R122 million grant (approximately USD12 million in 2014) from the Jobs Fund to help create 3000 jobs in these factories.

3.4 Achievements and Evaluations of the environmental sub-programmes

3.4.1 Achievements of the Working for Water Programme to date

Between 1995 and 2011, WfW teams cleared over 2.1 million hectares of land, which is estimated to have resulted in an additional 48 to 56 million cubic meters of water annually. This is equivalent to approximately 17% of the total potable water consumed by the City of Cape Town on an annual basis, with a population of 3.2 million people.

Since 1995, South Africa has invested R5.6 billion in the WfW portfolio. Approximately 25,000 work opportunities have been created per year, on average, with over 54,000 work opportunities created in 2012/13 alone (DEA, 2012b).

> Overall it is estimated that around 7% of riparian invasions have been cleared (as of 2007). The estimated increase in yield from this clearing is highly significant. The increased estimated yield of 34.4 million m^3/year is about 42% of the yield of the new Berg River Scheme (81 million m^3/year) in the Western Cape which was developed at a cost of around R1.6 billion. The investment in clearing species known for excessive water use from riparian areas at a cost of R116 million is therefore a very good investment.
>
> *Source: Marais & Wannenburgh, 2007)*

The employment component of WfW was important in obtaining and maintaining broad political support, and therefore securing ongoing funding. This was enhanced by the following aspects:

- A focus on the rural poor, previously disadvantaged people living in under-developed rural areas.
- A special emphasis on addressing gender imbalances, with a target of ensuring that at least 60% of the wages would be earned by women.
- The provision of training, both to equip beneficiaries for the tasks that they had to do, as well as to provide some life and development skills. Training within the programme therefore had three components. Training in work-related activities (the development of skills in machine and herbicide use,

[18] At this stage the relative commitment of funding by DEA and SanParks has not been ascertained.

and worker safety issues), training in health (with a focus on HIV/AIDS), and contractor development.
- The development of entrepreneurial skills for contractors, which tried to progressively develop these contractors as small businesses.
- Helping ex-offenders and military veterans to re-integrate. Former offenders have particular difficulties in finding work in a high unemployment environment (van Wilgen *et al*, 2010).

3.4.2 Cost-benefit assessments of the Working for Water Programme

The initial motivations for the WFW programme were based on the quantity of water losses from IAPs and the employment benefits. Cost-benefit studies have only occurred subsequently, focussing mostly on water and the losses as a result of doing nothing.

Before and since the programme's inception a number of studies were done, focusing on localized impacts of clearance on natural resources. Studies have confirmed that the removal of IAPs is beneficial to water supply, finding increased in-stream flows of between 9 and 12 m^3/ha/day immediately after clearing (Dye and Poulter, 1995; Prinsloo and Scott, 1999; referenced in Marais & Wannenburgh, 2007).

WfW has commissioned several economic evaluations of their programmes to control invasive alien plants, which have focussed in the economic valuation of ecosystem services, and the relative costs of labour intensive compared to biological methods (van Wilgen *et al*, 2004; De Lange & van Wilgen, 2010). "The work concluded that the value of lost ecosystem services would have amounted to an estimated additional R41.7 billion had no control been carried out, and that 5 - 75% (depending on the group of weeds) of this protection was due to biological control. The benefit cost ratios arising from biological control research ranged from 50:1 for invasive sub-tropical shrubs to 3726:1 for invasive Australian trees…" (van Wilgen *et al*, 2010).

However, there have been few broader economic assessments of the programme. In addition to the value increase in mean annual run-off arising from the IAP cleaning activities, the economic benefits of the WfW programme stem from the restoration of ecological diversity and productive land, the training of people, the benefits arising from secondary industries, the cash injection into poor households via wages and tools, and the holistic development of beneficiaries through the social development unit. The economic costs of the Programme are made up of direct financial costs (total programme costs plus negative impact costs).

According to various studies, the economic viability of the WfW programme is not constant across the country. While the programme appears to be viable in the Western Cape and Kwazulu-Natal provinces, its viability has been questioned in the Eastern and Southern Cape areas of the country (Du Plessis, 2003).

Subsequent studies have confirmed this finding, based on increased water yield and livestock potential, on six selected sites in the Eastern and Southern Cape, and found a benefit-cost ratio of only 0.62:1. This result only changes with lower costs and discount rates. However, when the preference for indigenous vegetation (based on contingent valuations) as a non-water benefit was added to the cost benefit profile, benefit-cost ratio comes to 114:1 (Du Plessis, 2003).

A study based on data extracted from the WfW Information Management System assessed clearing costs and estimated impacts of clearance on water resources. The

major findings underline the need to treat invasions as early as possible, as the costs of clearing increase as the density of the invasion increases. Very scattered or light (1 – 5%) invasions of selected species were between 3 and 25 times cheaper to clear than closed canopy stands with dense infestations (75 – 100% alien coverage). An important contributing factor in the cost of clearing is the number of follow-up treatments needed (Marais & Wannenburgh, 2007).

Marais & Wannenburgh (2007) suggest that in some cases actively restoring indigenous vegetation cover should be considered to reduce the costs of follow-up clearing. Where bio-control[19] is a management option it should also be considered, but in the short-term, bio-control in most cases simply reduces the rate of spread, rather than reducing the total extent of the invasion. However used in combination with labour-intensive techniques, it will help to reduce the costs of clearing greatly.

3.4.3 Achievements and Evaluation of the environmental programmes in general

Unlike the WfW programme and its off-shoot programmes, which were based on direct academic research and funded follow-up research, the sub-programmes developed under the DEA (formerly DEAT) built on the success of the WfW programme, and were formulated largely in response to the National Poverty Relief strategy introduced in 2000. As a result, subsequent evaluations have been focused on the achievements of the national socio-economic priorities. Environmental objectives have been measured in terms of achieving explicit goals (such as clearing an area of alien plants, rehabilitating a donga [eroded gully]), and have not been the subject of detailed cost-benefit studies, or environmental valuations. Evaluations have been more institutional and qualitative in nature. Reflecting the national character of the framework strategy, they have also been conducted across all programs, rather than focussed on detailed analysis of individual programmes.

Starting from an initial budget of R27 million in 1995 (approximately US$6 million at the exchange rate at the time), and job opportunities for 6,163 individuals (or the equivalent of 2000 full time positions), the environmental programmes now have a combined annual budget of R2.6 billion (about US$ 260 million using the average 2013 exchange rate), and created work opportunities for almost 100,000 individuals in 2013, the equivalent of just over 35,000 full time equivalents. In other words, the average beneficiary was employed for about a third of a year.

Table 4: Performance of the consolidated Environmental Programmes

			Fulltime Equivalents		Work opportunities	
	Budget R'000	**Expenditure R'000**	**Target**	**Actual**	**Target**	**Actual**
2009/2010	1,390,952	1,385,966	27,806	7,314	55,728	46,924
2010/2011	1,476,727	1,362,984	25,825	16,614	49,917	52,576
2011/2012	1,989,047	1,887,918	29,893	20,881	60,343	53,803
2012/2013	2,626,644	2,563,122	40,984	35,323	82,296	99,548

[19] Bio-control, or biological control, is the use of biological agents such as insects, mites or fungi to control invasive alien plants. These agents are natural enemies of the invasive alien plants, and therefore through impacts such as limiting their spread by making plants sterile or reducing seed production.

Evaluations conducted to date have noted certain limitations, including the lack of any formal mechanism for follow-up on beneficiaries, as there is no database of beneficiaries. Any information on individuals following the end of their employment in the programmes is largely anecdotal (DEA, 2012a).

Concerns identified by various evaluations (DEA, 2012a; DEAT, 2007; DEAT, 2004) include:

- The limited success at generating permanent jobs; A 2007 evaluation noted that while many jobs were being created, with approximately 26% of budgets allocated to community wages, this very seldom led to permanent jobs opportunities. Following project completion less than 1% of the jobs created were permanent.
- The replication of project types without clear links to the needs of communities or the resources of the area. For example, the construction of waste recycling projects in remote rural areas with very little recyclable waste, or tourism projects such as cultural villages where there are no tourist destinations.
- The appropriateness of funding long-term maintenance activities through temporary poverty relief funding was questioned.
- The tension between poverty alleviation and environmental goals. "i.e., should the (EPIP) allocate its budget to services related projects and maximise job opportunities and training or should it aim for more expensive infrastructure projects that will deliver less by way of job opportunities and training but potentially greater longer term impact and sustainability?." (DEAT, 2007: 6).
- Recognition that the EP adds operational roles to the DEA primary function, that of regulation. It plays both the role of funder, and development agency, actively engaged at the project-specific level in detailed implementation.
- The lack of a clearly articulated Programme Theory[20] or Theory of Change[21] (e.g. logical framework or results chain) for impact.

In term of social impact, a 2007 evaluation interviewed a sample of 212 beneficiaries, and made the following conclusions:

- "The SRP (now EPIP) is providing much needed temporary employment and income to poor and marginalised communities in South Africa;
- Beneficiaries responded positively to the role of the (EPIP) and were thankful for the opportunity to earn an income;
- While training is viewed positively, over 60% of the beneficiaries interviewed felt that the training they received would not be useful to them beyond the lifetime of the project;

[20] Programme Theory: The set of assumptions about the manner in which programme relates to the social benefits it is expected to produce and the strategy and tactics the programme has adopted to achieve its objectives, National Policy Evaluation Framework, Government of South Africa, November 2011.

[21] Theory of Change: A tool that describes a process of planned change, from the assumptions that guide its design, the planned outputs and outcomes to the long-term impacts it seeks to achieve. National Policy Evaluation Framework, Government of South Africa, November 2011.

- Beneficiaries indicated that the project had positively impacted on their senses of self and that they felt more personally confident as a result of involvement in the project;
- Beneficiaries indicated that the manner in which the projects were contributing to broader community sustainability issues was at times unclear;
- In limited cases, the increased access to cash resulted in some beneficiaries getting themselves into credit debt or spending money on excessive alcohol consumption." (DEAT, 2007: 9).

A 2012 evaluation conducted after the first 5 year cycle of the EPWP up to 2009, undertook a detailed evaluation of 48 projects which were reviewed and evaluated in terms of "efficiency, relevance, effectiveness, impact and sustainability." The four focus areas in 2009 included People & Parks, Working for the Coast, Sustainable Land Based Livelihoods (now Working for land), and Working on Waste.

The evaluation found that the environmental objectives were delivered, on average, at a success rate of 80 – 100% of the target as per the business plans for the various projects. It should be noted that these objectives are expressed in terms of specific deliverables, such as number of hectares of land to be cleared of alien plants. Additionally, the socio-economic deliverables were also met in most cases; for example, temporary jobs were created at an average of 80 – 100% compared to the business plans. There are significant doubts as to how many beneficiaries have been able to use the work experience and training to secure work outside of the programme (DEA, 2012a).

The projects were tasked with preparing the beneficiaries for future employment through the provision of training and skills development. Training generally includes both project specific skills, and more general ABET[22] courses where the individuals can receive formal credit. In reality, the training was often of too short a duration, not in demand or aligned with the needs of the formal job market, or repetitive.

Despite these limitations, it is helpful to reflect on how the baseline for social impacts has changed. Four years into the broader poverty relief strategy and implementation of projects within DEAT, a 2004 review summarised the impact as follows:

> "In most instances the Poverty Relief Programmes have targeted the poorest by creating short and long-term employment, but at the same time addressing environmental issues and promoting tourism. The programme has also created opportunities for small business enterprises and encouraged investment by the private sector in areas where it was reluctant to invest in before. *The programme*

[22] Adult Basic Education and training (ABET) "is defined as the general conceptual foundation towards lifelong learning and development, comprising knowledge, skills and attitudes required for social, economic and political participation and transformation applicable to a range of contexts." http://www.education.gov.za/20years/Programmes/AdultBasicEducationandTraininggAbet/tabid/1130/Default.aspx

has changed forever the lives of many poor people who had never been employed before, earned a wage or had never had a bank account or even been allowed to buy on credit. The programme has had most of its impact on women who have never worked and whose chances of being employed remained very low until the programme offered them opportunities. Women have received training, skills and experiences that would never have been possible without the Poverty Relief Programme. The employment opportunities, training and skills have opened opportunities for many to be employed in the formal sector or to be self-employed." (DEA, 2004, emphasis added by authors of this report).

While the hoped for long-term employment opportunities in the formal sector have been slow to materialise, it is clear that for many it would have transformed their lives in ways which have unfortunately never been tracked: the impact of having a bank account for the first time, or access to credit, particularly for women would undoubtedly have had a significant impact.

3.5 Funding of the Environmental Programmes

Since the early days of WfW, funding has been channelled from the National Treasury to the sector department, first through the Reconstruction and Development Programme (RDP), then the Special Public Works Programmes which evolved to become the Expanded Public Works Programme (EPWP). Such funding flows through the departmental budget, but is clearly earmarked for expenditure on projects falling under the EPWP umbrella. There has also been limited funding from donors (private and international), especially in the early days of the WfW programme, but this makes up only a small proportion of the total budget. The principal source of programme funding has been the national fiscus (Turpie, Marais & Blignaut, 2008).

As mentioned previously in the report, historically, the Environmental Programmes were housed in both the former Department of Environmental Affairs and Tourism (DEAT) and Department of Water Affairs and Forestry (DWAF). As a result of this, the staggered nature of the sub-programmes' implementation, and the database record-keeping on the programmes, financial information is captured primarily under three categories: NRM/Working for Water (which includes all its off-shoot sub-programmes), Working on Fire[23] (the second-largest NRM sub-programme, located outside of government) and EPIP (comprising all its composite sub-programmes).

In 2012/13, the WfW programme, the Working on Fire programme and their off-shoot sub-programmes within NRM had an annual budget of R1,596 million (approx. US$150 million), while EPIP amounted to R1,129 million (approx. US$106 million) as shown in the table below. In comparison, the government's total expenditure on all national and provincial parks and their related activities and management in 2012/13 was R568 million[24] (approx. US$53 million) (National Treasury, 2014). In effect, the funding apportioned to the EP Branch supplements funding of other branches also responsible for the sustainability of ecosystem

[23] Working on Fire functions as a stand-alone organisation, and for the reason its budget is separated.

[24] This corresponds to the role performed by the Biodiversity and Conservation Branch of the South African National Department of Environmental Affairs.

services. The major difference being that the Environmental Programmes have at their heart a responsibility to create employment.

To date the sub-programmes have attracted significant financial resources and have generated a noteworthy number of jobs (or in terms of KPIs, Full-Time Equivalents). The table below displays these estimates at an aggregated scale for the NRM (Working for Water and composite sub-programmes and Working on Fire) and EPIP programmes.

Table 4: Historical expenditure on the NRM and EPIP programmes

Historical Work	**Working for Water**		**EPIP (SRPP)**		**Working on Fire**	
Financial Year	Budgets South African ZAR ('000s)	Full-time Equivalents (FTEs)*	Budgets South African ZAR ('000s)	Full-time Equivalents (FTEs)	Budgets South African ZAR ('000s)	Full-time Equivalents (FTEs)
1995/1996	R 27 046	2026				
1996/1997	R 86 668	6281				
1997/1998	R 251 436	15196				
1998/1999	R 260 534	12359				
1999/2000	R 241 762	11853	R 28 721			
2000/2001	R 328 520	11143	R 132 978	214		
2001/2002	R 365 923	9820	R 196 757	3258		
2002/2003	R 396 300	12343	R 240 969	4629		
2003/2004	R 393 124	7538	R 323 593	7333	R 21 000	
2004/2005	R 422 932	5141	R 391 122	5195	R 36 100	852
2005/2006	R 400 175	6910	R 416 428	8298	R 40 000	1482
2006/2007	R 354 371	6131	R 447 551	11493	R 49 500	1587
2007/2008	R 384 228	7119	R 707 660	5451	R 69 146	1440
2008/2009	R 477 481	7193	R 818 956	3777	R 100 158	2017
2009/2010	R 508 772	6862	R 758 716	4110	R 108 208	1802
2010/2011	R 748 893	9915	R 605 819	9229	R 208 115	3078
2011/2012	R 966 188	7930	R 630 519	10434	R 338 339	4710
2012/2013	R 1 196 456	12020	R 1 129 900	17766	R 400 090	5515
**A Full-Time Equivalent job is 230 person days worked within a financial year. Thus, in 2012/13 the Branch had a budget of ZAR2 726 446 000, and created 35 301 FTEs or over 8 119 000 person days.*						

Source: Department of Environmental Affairs, 2012: 24

In terms of understanding how the individual EPIP sub-programme budgets can be further broken down into categories such as project management, wages etc., it is important to note that due to EPWP budget criteria, these elements are unlikely to differ between sub-programmes, by design. To elaborate further, under the EPWP project criteria, project budgets must be broken into the following categories. Of these categories, expenditure on training, wages, and project management are required to fall within certain prescribed limits, which vary slightly by sub-programme. The categories and their prescribed limits are:

- Project Management Fees: Maximum limit of 15-18%. Youth Environmental Service may not exceed 15%.
- Training Cost: Limit of 9%, of which 7% must be accredited. This is increased to 25% for Youth Environmental Service
- Wages – EPWP: 35% minimum, with 45-55% the (informal) target of the more labour intensive WfW activities.

The remaining categories are subject to approval, but are obviously restricted by what remains of the budget:

- Materials and Equipment
- Transport Costs
- Marketing
- Community Facilitation
- Workman's Compensation
- Other – used for any mandatory requirements.

Due to these strict budgetary guidelines, comparative analysis of expenditure between sub-programmes is not particularly helpful.

3.5.1 Harnessing private sector funding

Van Wilgen *et al* (2010: 17) acknowledge that the Working for Water programme has been challenged by a lack of private sector investment. One of the reasons for this could lie in "…the perceived high levels of income (available) from the EPWP…". This finding applies to all of the environmental programmes, where the relative abundance of funding might have the effect of "crowding out" private actions. A suggestion made is for the DEA to leverage off its EPWP funding to unlock private sector involvement. Such actions have begun to take shape, particularly in NRM where two showcase examples of attracting private sector co-funding present themselves including a Land User Incentive programme and the Medupi Leadership Initiative.

Land User Incentive Programme/Scheme

In an effort to attract additional investment resources for NRM projects, NRM recently introduced a Land User Incentive scheme. This is an application based system whereby private (this can include traditional authorities) landowners and/or Implementing Agents make applications to the DEA together with a commitment of co-funding (or equivalent contribution of labour/in-kind support). In this case projects are evaluated comparatively based on a set of criteria which include the capability of the implementers, their track record and the technical features of the project. A key element of the programme is that the DEA seeks to attract partners, rather than service providers, to support its implementation of the environmental programmes. The programme has at its heart a number of key objectives including:

- Developing a market for investments in natural infrastructure and ecosystem services;
- Identifying ways to 'stretch' NRM's existing funding;
- Maximizing employment while optimizing/minimizing the cost of natural resource restoration and maintenance (DEA, 2013).

Medupi Leadership Initiative

The *Medupi Leadership Initiative* initiated by the DEA EP Branch works in collaboration with local construction companies Murray & Roberts and Basil Read, the sole electricity utility in South Africa, Eskom, and the provincial Limpopo Department of Economic Development, Environmental and Tourism. The primary objectives of the programme are two-fold: 1. Restore natural infrastructure and ecosystem services in the Lephalale and Waterberg Municipalities of the Limpopo Province and, 2. Assist with the employment of Medupi contractors' local unskilled and semi-skilled demobilised employees[25]. This particular initiative sees private sector investment comprising 90% of the project's financing versus the 10% afforded by NRM. While it is currently at its pilot phase of implementation, the programme's funding sustainability for its initial 3 years is secured.

3.5.2 Sustainable financing: Payment for (Investments in) Ecosystem Services

Payments for Ecosystem Services (PES) (generally referred to as investments in ecosystems (IES), rather than payments in perpetuity in the South African context) have been explored both as a broad-scale conservation tool, and as an additional funding source for WfW. An IES programme involves voluntary payments being made for well-defined ecosystem services (or land users that are likely to secure those services) that are conditional on service delivery (Wunder, 2005 in Turpie, Marais and Blignaut, 2008: 1). The 'transaction' thus includes at least one buyer and one service provider which could be represented by private individuals, companies, non-government organisations, or the state (Turpie, Marais and Blignaut, 2008: 1). IES is intended to incentivize landowners and communities to maintain intact ecosystems, restore the natural environments of degraded land, and use natural resources sustainably (Sherbut, 2012).

The Working for Water programme has enacted IES in two ways: firstly historically, through the use of a share of municipal water tariff revenues to restore water catchments in targeted areas through the removal of alien plant species (Turpie, Marais and Blignaut, 2008) and secondly, through the payment of rural communities to remove invasive plant species from their waterways (so as to increase water flow and availability) (Sherbut, 2012). The latest development is the landuser incentives programme (discussed above), where community based organisations, to which landusers belong, are becoming the sellers of the ecosystem service.

The emerging IES system in South Africa differs from others in that the service providers are previously unemployed individuals that tender for contracts to restore public or private lands, rather than the landowners themselves (Turpie *et al*, 2008). An additional benefit of this approach is that, by protecting an "umbrella" ecosystem service such as water yield, ecosystems and their component biodiversity are also conserved, and will continue to deliver additional services that may be less easy to quantify, and whose protection would therefore be more difficult to justify (van Wilgen *et al*, 2010).

[25] In an effort to fulfil a demand for advancement in the construction of the Medupi Power (Electricity) Station, additional labour was employed. Once construction was back in line with expected time-frames, the additional labour employed were shed (demobilised).

Invasive alien plant management is seen as one service amongst other natural resource management activities that will constitute the supply side of the IES market in South Africa. The other services will include wetland and riparian restoration (restoration of erosion gullies, etc.) and management, integrated grazing and land use regimes and an integrated veld and forest fire management regime (Turpie *et al*, 2008: 9-10). In effect, IES through the WfW are viewed as optimizing on a chance to provide (a) sustainable financing of publicly owned protected areas, and (b) providing an incentive for private land owners to engage in biodiversity conservation in order to meet conservation targets that cannot be reached by the protected area systems (Turpie *et al*, 2008: 10).

The entrenchment and further rollout of IES in South Africa does rely on supportive institutional arrangements such as those established under South Africa's Water Act, National Water Pricing Strategy, the Green Economy Strategy, the National Climate Change Response Strategy, the National Environmental Management Act, and the Biodiversity Act. There is an expectation that NRM will eventually perform the role of a national coordinator of IES in South Africa (Sherbut, 2012).

4 Review and analysis of the public programmes

4.1 Institutional and policy perspective

Policy context

Beginning with the new Constitution, environmental and sustainability concerns have been "mainstreamed" across several national departments, with the DEA playing the role of sector lead. Comprehensive environmental policy and legislation has been developed over the past 20 years since 1995, which provide the broader policy context for the environmental programmes.

There is broad policy recognition within South Africa that environmental degradation exacerbates poverty, and that improving the natural resource base enhances livelihoods and improves people's quality of life. This realisation has provided a comprehensive policy framework for the development of the environmental programmes, building on the earlier success of the Working for Water programme.

Intergovernmental cooperation

South Africa has a well-developed institutional and regulatory framework for environmental governance. However, there is considerable unevenness of capacity for environmental regulation and implementation at the provincial and local levels. Capacity in environmental management at the local level has been slow to grow. This can be attributed to the fact that by its nature, the primary role of local government is to provide municipal services, while providing such services in an environmentally sustainable manner is a secondary concern.

The lack of municipal capacity in many areas has contributed directly to the historical development of the environmental programmes, with gradual broadening of activities where weaknesses have been identified. While this has helped to strengthen the causal logic of the sub-programmes, it has resulted in the development of activities which overlap with the mandates of other departments or spheres of government.

Research and collaboration

One of the success of the environmental programmes, in particular Working for Water, has been the fostering of ongoing relationships with research organisations. According to van Wilgen *et al* (2010), the existence of the WfW programme, and the provision of limited funding for research, has facilitated an expansion in research in the field of invasion ecology and management in South Africa. Although it is not primarily a research-funding organization, it has wielded significant influence, and promoted relevant research, in part through the establishment of strategic research partnerships. The WfW programme has established a research advisory panel that assists in the identification of priority research questions and monitors the quality of research outputs that are directly funded by Working for Water. Funding has been awarded for research into landscape hydrology, the ecology and control of invasive plants, resource economics, social aspects, and the development of operational solutions to management problems. Besides funding research directly, Working for Water has also established a number of collaborative agreements with individuals and research institutes with a view to accessing co-funding for projects of direct interest to Working for Water, or of influencing the direction of research. The WfW's strategic partners include the Council for Scientific and industrial Research (CSIR), the Water Research Commission (WRC), the Agricultural Research Council (ARC), academic institutions, and the South African National Institute for Biodiversity (SANBI).

The research conducted by and in collaboration with these organisations, although not cited in DEA policy documents, has informed the development of activities undertaken by the many of the environmental programmes. For example, many of the other sub-programmes (People and Parks, Working for Land, Working for the Coast) undertake alien species clearing activities. There is however, ample scope for the newer sub-programmes to commission research into their own specific activities.

4.2 Socio-economic perspective

"WftC SANParks Namaqua project is intended to maintain the parks valued assets, preserving the region's biodiversity, general ecological value and attractiveness for visitors, including the 3500 indigenous plant species, a 1000 of which are exclusive to South Africa. The project exceeded 4 of its 6 targets, maintaining an additional 27km of road, erecting 120km of extra fencing and, clearing 651% and almost 21 times (1901%) its stated alien and clearing targets. The project also managed to exceed its EPWP prescribed targets, employing an additional 5 beneficiaries and training 53 more workers than originally planned. Unfortunately, the project has not been able to improve the employability of the beneficiaries once they leave the programme – mostly due to the lack of available employment opportunities in the area, nor has any sustainability plan been implemented other than continued SRP funding."

Source: DEA, 2012a

In terms of broader EPWP policy, the target groups are unemployed, local, low skilled South Africans willing to work on EPWP projects for a daily wage of between R60 and R150 a day, with a particular emphasis on women, youth and the disabled.

In this context, little attention has been paid at the national level (between national departments) to issues of cost-effectiveness. Where it has, cost-effectiveness is assessed mainly as the lowest cost per job created, rather than the cost

effectiveness of achieving certain environmental outcomes (with the notable exception of research conducted under the WfW programme)[26]. However, the context of large scale unemployment experienced in South Africa and other developing countries must be taken into account when assessing cost-effectiveness.

Beyond the number of job opportunities created, it is not clear exactly what social impact the jobs component of the EP is having. Within the EP, there has been no formal analysis of this, and it would be difficult for DEA to do, given the national framework and scale of the EPWP.

Despite the optimism of earlier evaluations (DEAT, 2004) with regard to the social impact of the EP, and the longer term prospects of the project beneficiaries, there has been growing recognition of the difficulty of using temporary employment and training as a spring-board to opportunities in the broader economy. While an immense effort has been put into training and development of people employed on the environmental programmes, South Africa faces a significant challenge of structural unemployment.

While training might have been unsuccessful at helping many individuals find work outside the programmes, recipients have benefited from training which included technical skills as well as life development skills such as personal finance, HIV training and primary health care.

The response to the inability of the broader economy to absorb the people "graduating" from EP employment, and the lack of permanent jobs being created has been two-fold:

- Firstly, the EPWP has lifted earlier restrictions on the period that individuals could be employed by the programmes, and accepts that for many people they will cycle through several rounds of projects.
- Secondly, the DEA has been proactively investigating the possibilities for permanent jobs based on an appreciation of biological diversity and conservation, and other aspects of a sustainable environment. This has led directly to the development of the Wildlife Economy sub-programme, and an ongoing effort to support the development of small businesses which support the environmental goals of the DEA.

To address the issue of employment in formal economic sectors, the emphasis in EP and the broader EPWP, has changed, from a programmatic approach where government takes full responsibility for the funding of EP project, to the current approach of landuser incentives and the development of a formal IES/NRM sub-sector, as an economic sub-sector.

There has been a shift away from temporary employment and a programmatic approach for implementation, to a sector development approach. DEA tends to play a sector leadership role, rather than a programme ownership role.

A critical achievement of the Environmental Programmes has been the development and integration of teacher resources and materials on alien invasive plants and

[26] The cost-effectiveness of "work-fare" as implemented under the EPWP compared to other options, such as a straight welfare programme, is beyond the scope of this chapter.

other environmental issues into the environmental education curriculum. Coupled to this has been many youth competitions, and the establishment of an Education Unit. While its origins were formally due to a National Youth Service programme, the Youth Environmental Service (YES) sub-programme has built on earlier strategies within the DEA and DWA to ensure that a cadre of young people are brought into the programme in a systematic and planned way either through learnerships, internships and or through volunteerism (Marais, 2004).

However, despite the lack of data, and while the goal of permanent employment is still elusive, the social impacts are undeniable:

"*Feedback from women participants and others in the Poverty Relief Programme is that it is viewed as having provided more employment, training and business opportunities for poor women than any other programme to date in the new South Africa. Women have been employed in all manners of jobs that were traditionally regarded as men's jobs. These include bricklaying, making bricks, plumbing, plastering, painting and fencing. Women employed by Poverty Relief Projects have broken stereotypes about what women can or cannot do. …. The greatest impact that poverty relief has created for women, is enabling them to earn an income for the first time and hence be in a stronger economic position. Women are able to participate in major decisions for the first time at work places, at home and in the community because employment has given them new power. In the Northern Cape 80% of the women who were employed by Poverty Relief Projects (visited projects) had never had a bank account before being involved in the projects*." (DEAT, 2004).

While the WfW programme was focused on the eradication of invasive alien plant species, it also has a social development component, which aims at the promotion of small business and entrepreneurship development, particularly around the development of small contractors. A contractor is defined as an individual (or in a few cases, small teams) who has set up his/her own small business and conducts work for the WfW programme. They are not employees of the programme, but have commercial contracts with the WfW programme and are paid for completed quantities of work. Contractors are responsible for completing contracts as specified by the programme as well as recruiting and managing their teams and equipment. Workers are employed by contractors who enter into employment contracts with them. However, evaluations of this aspect have been limited by a lack of relevant monitoring data for the programme, and a relative lack of assessment of the effectiveness of its activities (Coetzer & Lowe, 2012).

Another socio-economic goal of the EP includes the promotion of Small, Medium and Micro Entrepreneurs (SMMEs). A 2012 evaluation found that "SMME creation targets appear to have been set quite arbitrarily rather than on any feasibility assessment looking at the need and the market for new businesses in a particular area. SMME creation that is 'quota-driven' is not sensible, and is ultimately risky considering over 70% of SMMEs fail within the first three years, particularly those far from markets and those with very little business inclination other than leadership. This is an extremely difficult task and the odds are stacked against success. Most implementation agencies are not equipped to do this task at all. Thus, in the absence of an extremely compelling business case, it would be far less risky and costly to work with existing SMMEs in the market." (DEA, 2012a).

There was greater success in terms of the use or development of exiting SMMEs, but a lack of additional data to verify what this means. For example, an SMME can be counted if they cater for training once in the entire life of the project, or they could be the transport company for 36 months, but both will be counted as 'One

SMME Used' in the project management system. SMME development and use should be encouraged as far as possible, but this should be sensible and relevant to a project, rather than quota-driven.

4.3 Environmental impact perspective

While the underlying rationale for the WfW programme and its offshoots was recognition for the impact of invasive alien plants on available water, project payments are not strongly linked to water supply delivery targets. Success is measured in terms of hectares cleared and the numbers of job created is generally reported as the major project outcome (Blignaut *et al*, 2007).

To date the NRM programmes have achieved the following:

Year	Person days	Beneficiaries	Initial Clearing	Follow-up	Total Hectares
1995/96	466,000	6,163	30 481	63	30 544
1996/97	1,444,600	8,386	53 533	10 350	63 883
1997/98	3,495,000	42,058	200 778	36 060	236 838
1998/99	2,842,600	24,000	105 335	93 583	198 918
1999/00	2,726,100	20,999	103 333	115 173	218 506
2000/01	2,563,000	23,998	117 807	133 151	250 958
2001/02	2,258,654	14,558	170 516	294 614	465 130
2002/03	2,838,792	21,754	253 131	502 579	755 710
2003/04	1,733,777	29,001	144 864	540 964	685 828
2004/05	1,182,541	25,767	97 788	380 753	478 541
2005/06	1,589,320	28,018	121 088	457 352	578 440
2006/07	1,410,178	21,561	136 841	585 183	722 024
2007/08	1,637,398	28,785	123 275	471 736	595 011
2008/09	1,654,371	25,339	144 636	451 839	596 475
2009/10	1,578,301	22,885	161 571	699 231	860 802
2010/11	2,280,561	28,315	184 353	781 683	966 036
2011/12	1,654,371	28,905	180 210	634 750	814 960
2012/13	3,009,320	42,480	162 655	642 962	805 617
2013/14	3,486,800	34,868	174 720	657 280	832 000
TOTAL	**39,851,684**	**477,840**	**2 666 915**	**7 490 306**	**10 157 221**

Source: Marais, pers com, 2014

From the table above, it is clear that each hectare of land cleared, requires on average 3 follow-up clearings.

Unlike other alien plant control programmes in other countries that focus on prevention and early detection, the WfW programme spends most of its funds on labour-intensive clearing because, as a public works project, it is expected to create employment in South Africa's impoverished rural areas. Despite its size, the

programme appears to be falling short, at a national scale, of the expectation that it would have brought invasive alien plant problems under control within a reasonable timeframe (Van Wilgen *et al*, 2012). While earlier studies assumed that no further spread would occur and that only one follow up treatment would be required, these assumptions do not appear to have been borne out in practice. However, the challenges of implementing in the South African context, with low levels of skills, has undoubtedly had an impact.

The WfW programme was initially put forward as a 20-year activity (van Wilgen *et al*, 1998), but there have been ongoing doubts about the reality of this claim, and growing recognition that clearing major infestations within that timeframe is not possible. By 2004 (Marais, 2004), it was estimated that at the rates of clearing at the time infestations of several important species would only be cleared within 30 – 85 years, although they warned that these estimates were unrealistic and that, at prevailing rates of management, the problem will not be contained. These concerns have been proved correct in subsequent studies (McConnachie, 2012, van Wilgen *et al*, 2012).

For example, in the case of pines, Working for Water's clearing records indicate that a greater area than was estimated to be under pines in 1995 had already been cleared by 2009 (74 519 ha cleared versus an estimate of 65 000 ha invaded in 1996, Le Maitre *et al*, 2000); yet invasive pines still dominate the landscape. Either the original estimate was far too low, or pines are spreading faster than they can be cleared. Either way, it illustrates the difficulties associated with assessing progress. The same problem is true when it comes to demonstrated benefits; most estimates of benefits are based on models rather than actual field monitoring (van Wilgen et al, 2010).

Assessment of the effectiveness of the work done at a landscape scale is difficult because only the input variables (money spent, area cleared, and jobs created) are recorded. A recent study by McConnachie *et al* (2012) which investigated the cost-effectiveness of the WfW programme in reducing invasive alien plant cover in 2 river catchments, found– by dividing the total costs by the change in invasive alien plant cover – that it cost 2.4 times more to clear invaded land than the highest equivalent estimate made in other studies. Further, it found that at current rates of clearing and funding, it would take 54 and 695 years to clear the two catchments in question, assuming no further spread. If spread is considered, current control efforts are inadequate, and invasions are likely to continue to spread in the catchments. The assessment suggested that invasive alien plant control projects urgently need to monitor their cost-effectiveness so that management practices can be adapted to use scarce conservation funds more effectively (McConnachie *et al*, 2012).

This finding has resulted in greater focus on the use of biological controls in certain areas, particularly in remote areas where job-opportunities are limited. There is growing recognition within the EP that both labour intensive and bio-control is required to address the invasive alien plant problem, together with better prioritisation and identification of areas which are best suited to labour-intensive clearing methods (Van Wilgen *et al*, 2012). However, both McConnachie and van Wilgen *et al* only looked at the hectares under mechanical control, and did not quantify the full impact of biological control measures, which are greater than they estimated. Biological control doesn't simply reduce the spread, but also reduces the need for follow up operations due to limiting regrowth. Further work is still required to assess the true impacts of biological control (Marias, per com, 2014).

However, the situation would undoubtedly have been much worse without the clearing efforts to date. "One estimate suggested that, had no control been carried out, the annual economic losses from alien plant invasions would have been as high as 41.7 billion rands (instead of 6.7 billion rands), and that a substantial portion of these savings (between 5% and 75%, depending on the group of plants) arose from the biological control of invasive alien plants (De Lange and van Wilgen, 2010). In addition, Working for Water was able to create 20,000 employment opportunities annually over 15 years in impoverished areas, where there would otherwise have been none." (Van Wilgen *et al*, 2012).

5 Lessons learned

5.1 Successes

A number of successes have been reported across the environmental sub-programmes with many of these corresponding to the overarching objectives of the sub-programmes as well as reaching beyond that to more holistic effects. Van Wilgen *et al* (2002), identify some of these to include:

Assessing environmental services: A number of publications from academic institutions pointed out the impacts that invasive alien species were having on water flow. The high-level publishing of this research led to programmes for restoring hydrological functioning.

Gaining political profile: Research into invasives and ecosystem functioning led to the mainstreaming of natural resource management programmes that simultaneously invested in employment and rural development so as to capitalize on the priorities of the national government.

Delivering economic and environmental benefits: The direct employment created by the Working for Water programme and other benefits such as invasive plant control, impacts on water security, improvement in the grazing productive of land, mitigation and adaptation to climate change, and disaster risk mitigation, let to its success. Furthermore, regular assessments of the programmes facilitated its expansion.

Enhancing social benefits: In addition to the above, the programme included extensive training for both vocational skills and life-skills, such as financial management, which further led its progression.

Improving legislation: The environmental programmes have directly led to the development of key legislation, including the National Environmental Management and Biodiversity Act, with its Invasive Alien Plant regulations, the National Veld and Forest Fires Act, and the Conservation of Agricultural Resources Act.

Building on success: The multiple outcomes of the Working for Water programme led to the development of further sub-programmes that maximize the integration of socio-economic and development objectives and large scale ecosystems conservation and restoration.

While an impact evaluation of all the environmental programmes of the EP branch in DEA is yet to be completed, there are some successes, as aforementioned, indicating the progress made to date in the fulfillment of the Working for Water sub-programmes and its related sub-programmes. The proceeding sections try to uncover some of the factors which have enabled these successes as well as the opportunities for enhanced efficiencies in the environmental programmes.

5.2 Enabling factors

The success of the environmental programmes in South Africa to date can in large part be traced back to the presence of several factors in South Africa in the mid-1990s. Many of these have been documented in earlier studies by van Wilgen *et al* (2002) particularly, in relation to the Working for Water sub-programme and their importance is even more apparent over a decade later. The following list of enabling factors is in no particular order.

A unique opportunity – South Africa in transition in the 1990s

South Africa in the 1990's oversaw a complete rewriting of practically all national legislation, policies and their supporting systems. The new government and the 'climate of acceptance of change' created an unparalleled opportunity to rethink national policies and systems, think creatively, and across departmental boundaries (van Wilgen *et al*, 2002). This unique opportunity to rethink policies enabled the government to prioritize supporting systems and invest in the WfW programme.

High-level Political Support

Cabinet level support and backing was key from the outset, beginning in 1995 with the request from the then Minster of Water Affairs for funding from the Minister in charge of the national Reconstruction and Development Programme (RDP). From these early days, the socio-economic benefits of the Working for Water sub-programme were recognized at the highest levels of government (van Wilgen *et al*, 2002).

"The argument put forward by Dr Guy Preston, then a researcher at the University of Cape Town (and a part-time promoter of resource-efficient sanitary wares), was that we should not build dams and transfer schemes until we have optimized the potential of demand side management and catchment management to meet our needs in ways that are efficient, equitable and sustainable. Central to efficient catchment management, it was argues, was the clearing of invading alien plants.

I was intrigued by the arguments, and we formed the National Water Conservation Campaign that then set out in pursuit of role-model examples of the practicability of these alternative approaches to equitable water security. Reinforced by cogent arguments put forward by the World Wide Fund for Nature – South Africa, I approached my dear colleague, Jay Naidoo, for funding. Jay was Minister without portfolio in the first democratic Cabinet of South Africa, responsible for the Reconstruction and Development Programme (or RDP).

Minister Trevor Manual had yet to take control of the finances of our country, so perhaps it is safe to confess that I approached Jay Naidoo for initial funding of R25 million, without a business plan. Jay is a wise person, and he saw the value of what was being proposed.

I cannot say that the rest is history, for we are still coming to grips with our strategies to deal with the threats posed by invading alien plants, let alone other invasive species. But I shall always look upon the Working for Water programme with special fondness. It embraces so much of our vision of the future for our country. It has led the country in its commitment to ensuring that the marginalized have access to opportunities, resources and dignity – the women, the disabled, the youth, the single-headed households, the rural poor, and more. It is working with ex-offenders, reuniting them with society. It is trying to ensure that there is after-care provision for the children of its workers. ***It is an environmental programme that is steeped in developmental necessity, and that is why it has been so successful****" (Key note address at the Symposium on Best Management Practices*

for Preventing and Controlling Invasive Alien Species by Professor Kader Asmal, former Minister of Water Affairs and Forestry, in 2000. Emphasis added)

This high level support has continued over subsequent changes of ministers, including Ronnie Kasrils, Bulelwa Sonjica, Rejoice Mabudafhasi, and Edna Molewa. Nelson Mandela was also Patron in Chief of the programme. High level political support has been vital to ensuring that the programmes have continued to receive financial support from the government.

Strategically positioned technical support and consistent, committed high level leadership.

At the outset, the World Wide Fund for Nature (WWF-SA) funded a high level technical advisory position within the Department of Water Affairs. This level of technical support to a key Minister and member of the Cabinet was instrumental in providing the WfW sub-programme with the political and financial support it has enjoyed.

Over time, the continuing presence of dedicated staff with a clear vision has been instrumental in the successful implementation of the sub-programmes. In many cases, the same people have been present since the mid-1990s, and have been working continuously to ensure the success of the sub-programmes. While the exact impact of this institutional memory is unclear, it seems reasonable to assume it has helped the long-term success of the Environmental Programmes (van Wilgen *et al*, 2002).

Linking the environment with social needs: Two for the price of one

The WfW sub-programme successfully linked the possibility of meeting both environmental and economic goals simultaneously. Recognising the labour intensive potential of the WfW sub-programme in a high employment context was key to the success of the sub-programme. It catapulted a sub-programme about controlling invasive alien plants, which would usually have languished in a minor department, into the national spotlight and linked it to the national Reconstruction and Development Programme (van Wilgen *et al*, 2002).

To quote Minister Kader Asmal again: "*It is an environmental programme that is steeped in developmental necessity, and that is why it has been so successful*". The programme would not have been successful without this explicit link to broader poverty alleviation and unemployment reduction goals.

Emphasising the potential economic benefits

In addition to highlighting the job creation and training opportunities which have continued to be a major feature of all the sub-programmes to date, a substantial body of economic research was undertaken which highlighted the very real economic impact that invasive alien plants had on annual water supply, and what the potential impact would be if left unchecked. This clear translation of an environmental nuisance (invasive alien plants) into an impact with identifiable and direct economic implications (reduced water supply) in the water scarce South African context was a key enabling factor.

Alongside the jobs created, local academic researchers have continued to investigate the economic impact of ecosystem services in South Africa (notably Marais, 1998; Marais, van Wilgen and Stevens, 2004; Turpie, 2004; Blignaut *et al*, 2007; Turpie, Marais and Blignaut, 2008; Nel, Marais and Blignaut, 2009).

Publicising the successes

From the mid-1990's, an effort was made to produce informative brochures in accessible language, forging contacts with key reporters to ensure that articles were carried in the media. This ensured that there was a widespread understanding of both the problem of invasive alien plants, and of the economic potential, and achievements, of the solution. This was also key to enabling the on-going allocation of funding.

Ongoing allocation of reliable and consistent funding at a national level

Based on the acceptance of the job creation possibilities created by conservation and biodiversity programmes, funding has been clearly allocated for the Environmental Programmes, beginning with the WfW programme in 1995 and expanding to include all the Environmental Programmes under both NRM and EPIP, under the framework of the Expanded Public Work Programme. This allocation of funding has occurred consistently since the mid-1990's, and continues to the current day.

Coordinating cross-departmental efforts in the Environmental sector

There is significant value derived from the EP branches' role in the broader EPWP structure. Specifically, as mentioned earlier in the report, the DEA is the lead department in the Environment and Culture Sector, one of four work sectors identified by EPWP. The DEA is meant to work cooperatively with the Department of Water Affairs (DWA), Department of Agriculture, Forestry and Fisheries (DAFF), Department of Transport (DoT), Department of Energy (DoE) and the Department of Arts and Culture (DAC). These cooperative relationships are important in ensuring the environmental programmes represent the demands and needs of the Environment and Culture Sector and that where necessary, collaboration is forged amongst sector partners to affect their effective implementation. The DEA is working with these and other government and public entity partners, particularly in the realm of policy, regulation and support mechanisms to, continue to make strides in the implementation of the environmental programmes.

5.3 Options for enhanced efficiencies

While there have been a host of facilitating factors, there have also been a range of inhibiting constraints to the successful implementation of the sub-programmes. Over time NRM has made concerted efforts to redress these as there is an acknowledgement that there is scope for enhanced efficiencies. Similarly, EPIP have faced limitations in their functioning but these have been revisited over time to enhance the sustainability of the sub-programmes. Some of these constraints and proposed efforts include:

The role of bureaucracy

While Van Wilgen *et al* (2002) highlighted *avoiding bureaucracy* as a key factor contributing to the success of the programme; the NRM programme has been unable to continue to avoid bureaucracy. It seems fair to agree that the initial *development* of the WfW sub-programme benefited from being located outside existing structures, accountable directly to the Minister. However, it has been unclear what role, if any, this has had in the ongoing success of the sub-programme, especially as it has been incorporated into other departmental structures.

Conversely, the Environmental Programmes which have evolved under the national EPWP strategy, have been characterized by a high level of central control reporting systems. As the WfW and EPIP programmes are integrated, the impact of this 'bureaucratization' on the future success of the programmes, if any, remains to be seen. That said, a recent Chief Directorate in the EP Branch, namely Information Management and Sector Coordination (IMSC) has as its mandate the need to "…ensure effective knowledge and information management support services for the branch activities, as well as managing the coordination of sector socio-economic interventions…".

Management capacity

With the rapid growth of the WfW sub-programme, a host of management constraints surfaced as insufficient efforts were exercised to ensure a clear strategy was developed for implementation (van Wilgen *et al*, 2002). Since then, the EP branch has ensured that at both its national and provincial offices there is coordination in the annual planning process to ensure consistency in the implementation of projects.

Another proposition made by van Wilgen *et al* (2012) is that management needs to be more 'adaptive' in its nature. In particular, the suggestion is that clear and achievable targets be set, an effective monitoring system is implemented, and that there be greater flexibility to adapt approaches. This suggestion has to some degree been effected in the form of the Annual Performance Plan developed for the Environmental Programmes Branch of the DEA as clear targets are delineated. The extent to which management practices are adaptable is yet to be determined as it has undergone (and is undergoing) its own evolution since the move of NRM from the Department of Water Affairs to DEA.

Effective and appropriate long-term planning and prioritization

In the early days of its development, funding for the WfW programme was strongly motivated by its ability to generate jobs in poor communities. This did however mean that at times, the areas most infested by alien plant species were not sufficiently targeted (van Wilgen *et al*, 2002). To redress this, NRM appointed a local research institute, namely the Council for Scientific and Industrial Research (CSIR), to develop a model of the Prioritisation of Quaternary Catchments for Invasive Alien Plant Control across South Africa. This prioritisation exercise is meant to be regularly updated for the nine provinces in the country and assist management staff at the national and provincial offices in the selection of projects on an annual basis. Further to this, there is also a need for improved monitoring and evaluation to ensure that the desired impact of the programme is being achieved. Van Wilgen *et* al (2012: 35), recommends that by setting clear goals, and targeting fewer species in selected priority areas, the available funds could almost certainly be used more effectively. To date, financial resources for research, monitoring or assessment has been limited as it would come at the expense of much needed employment.

Investing in training and improved skills

Previously one of the major constraints to effective management in the WfW programme was related to insufficient discipline, structures and training. Much of this challenge was overcome by the requirement that the Environmental Programmes comply with the EPWP standards, one of which relates to mandatory training. The implication is that a share of each beneficiaries' working days on a

project (2 days out of every 20) includes training of some kind, from the use of equipment appropriate to the project, as well as in terms of health and safety. Further to this, a key element of the WfW programme is its attempt to facilitate contractor development. There have been some problems in the past with inefficiencies in control operations, but van Wilgen *et al* (2012) suggest that these can be overcome with enhanced efficiency and professionalism in the application of standard control operations. The national EPWP has also imposed a more consistent set of requirements with regard to training across all job creation projects as it is expected that such training is an asset to beneficiaries when they seek employment after their participation in the sub-programmes. The lack of a mechanism to track project beneficiaries is a key limitation to assessing the broader socio-economic impact of their employment in the programme.

Effective operations on land not under conservation

Most land in South Africa is under private ownership. To date, there have been instances where the WfW programme has provided private and other land-users (such as tenant farmers or tribal authorities) with assistance in the clearing of invasive alien plants from their land with the clear requirement that the land-owner assume responsibility for preventing the re-invasion of invasive alien plants. In many instances land users have not honoured these agreements, which has allowed alien plants to re-establish themselves, reversing the gains funded by the public programme (van Wilgen *et al*, 2012). In order to facilitate the monitoring of land-owner compliance with such agreements, NRM established a Directorate: Bio-security, tasked with preventing, controlling and where possible and appropriate, eradicating invasive alien species (DEA, 2012). This Directorate is also responsible for issuing directives to land-users who do not comply with these agreements. Land-users are given an appropriate amount of time to address their non-compliance and if they have not done so in the allocated time-frame, the DEA's Legal Authorisation and Compliance and Enforcement branch enact its enforcement role. The Directorate is still in its infancy but has begun to address non-compliance in the Western Cape Province of South Africa.

In the case of EPIP, a similar contractual agreement is signed before the inception of projects to ensure the transfer of the end-product or asset, to the relevant owner (which in many instances is local government or state-owned entities). The responsibility for the management of the asset is then left in the hands of the asset owner to ensure its sustainable management. The degree to which there is an element of monitoring and/or evaluation of these assets after their handover is not apparent.

Promoting widespread use of investments for ecosystem services schemes

As discussed in the section regarding the funding of the environmental programmes, some water utilities and municipalities have contracted Working for Water to control invasive alien plants in their water catchments, using payments for services (in this case water supply to users, Turpie *et al*, 2008). IES (within the SA context) is intended to incentivize landowners and communities to maintain intact ecosystems, restore the natural environments of degraded land, and use natural resources sustainably (Sherbut, 2012).

To date, IES is yet to be implemented on a widespread scale, but the landuser incentive program is a step in the right direction. The entrenchment and further rollout of IES in South Africa does rely on supportive institutional arrangements however, such as those established under South Africa's Water Act, National Water Pricing Strategy, the Green Economy Strategy, the National Climate Change

Response Strategy, the National Environmental Management Act, and the Biodiversity Act. There is an expectation that NRM will eventually perform the role of sector leader of IES in South Africa, (Sherbut, 2012).

Expanding local government capacity to sustain environmental resources

As mentioned previously in the report, while South Africa has a well-developed institutional and regulatory framework for environmental governance, there is considerable unevenness of capacity for environmental regulation and implementation at the provincial and local levels. The lack of municipal capacity in many areas has contributed directly to the historical development of the environmental programmes, with gradual broadening of activities where weaknesses have been identified.

EPIP has played a vital role in building the capacity of provincial and municipal authorities through the implementation of its sub-programmes. Projects implemented by EPIP proactively support local government in protecting and sustaining their natural resources (such as for example, through litter picking at the coast), and, expanding the sustainable environmental assets of local government (for example, through the establishment of recycling centres). In doing so, EPIP is filling a gap in local government capacity and ensuring that opportunities to safeguard environmental assets are not foregone.

6 Conclusions

In summary, the key successes of the environmental programmes include the enhanced conservation of biodiversity; gaining (and maintaining) a high political profile and support; delivering economic and social benefits; improving environmental awareness in schools and the communities where projects take place; improving legislation; and stimulating applied research.

The enabling factors include the presence of a unique moment in time (or policy window) where there was willingness to try new approaches, and the presence of a high-level of consistent political support and championship of the programmes. This in turn resulted in a reliable funding source, assisted by a clear twinning of environmental and developmental needs which are a political priority. The ability to tie the environmental problem to a clear economic impact (in the case of water), combined with collaborative research leading to evidence based policy were further factors in the support of the programmes. This was further enhanced by good communication of the successes, and inter-departmental coordination.

A key realization has been that success of the programme is driven by people, and champions, and not by systems. The lesson has been that systems alone cannot guarantee success; it depends rather on people, who in turn need the ability to be able to experiment.

There are also obviously areas where improvements are needed: this includes simplification and streamlining of the overall national project reporting systems, which impose a significant cost on projects due to their complexity; improved prioritization; enhanced skills training to reduce the need for avoidable follow-ups; partnering with the private sector to ensure that they take responsibility for their own land; and the improvement of municipal capacity to tackle some of these issues.

The intention of this case study is to explore how and why South Africa decided to develop public programmes with both socio-economic and development objectives, and the achievements to date. It is evident that, as a whole, the South African environmental programmes are well founded and are evidently making a considerable impact (particularly in terms of the number of job opportunities created) given the scale of funding allocated. While there is a need for more impact assessments of the environmental impacts of the sub-programmes, a significant amount of research has been done on the Working for Water sub-programme and is equally pivotal for the other sub-programmes in the EP branch.

Earlier concerns (DEAT, 2007) suggested a weak alignment between the long-term sustainability goals of the DEA and the short term poverty relief goals of the EPWP are reduced. The reasons are two-fold: firstly there is a tacit recognition that the need for poverty relief will not be temporary, and of the long-term need for a "social wage", which the DEA projects can contribute to; and secondly is the view that the environmental sector can be a source of permanent job opportunities. This has resulted in a shift of focus to support of SMMEs in situations where the goals of poverty alleviation and environmental degradation are aligned, and indeed the development of the environment as an economic sub-sector in its own right. The long-term impact of this shift remains to be seen.

As van Wilgen *et al* (2012) point out, the initial focus of the WfW programme was on addressing ecological impacts, with the additional benefits that the work could be carried out in a labour-intensive way. However, the reality of very high structural unemployment in South Africa means that both in political and human terms, unemployment is a far greater problem. This constrains the ability of the EP to address inefficiencies which may come to light, particularly if the solution may come at the cost of employment in certain areas. In the context of long-term structural unemployment, the challenge for the Environmental Programmes will be to continue to be a source of large-scale employment, without unduly compromising the core environmental goals.

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