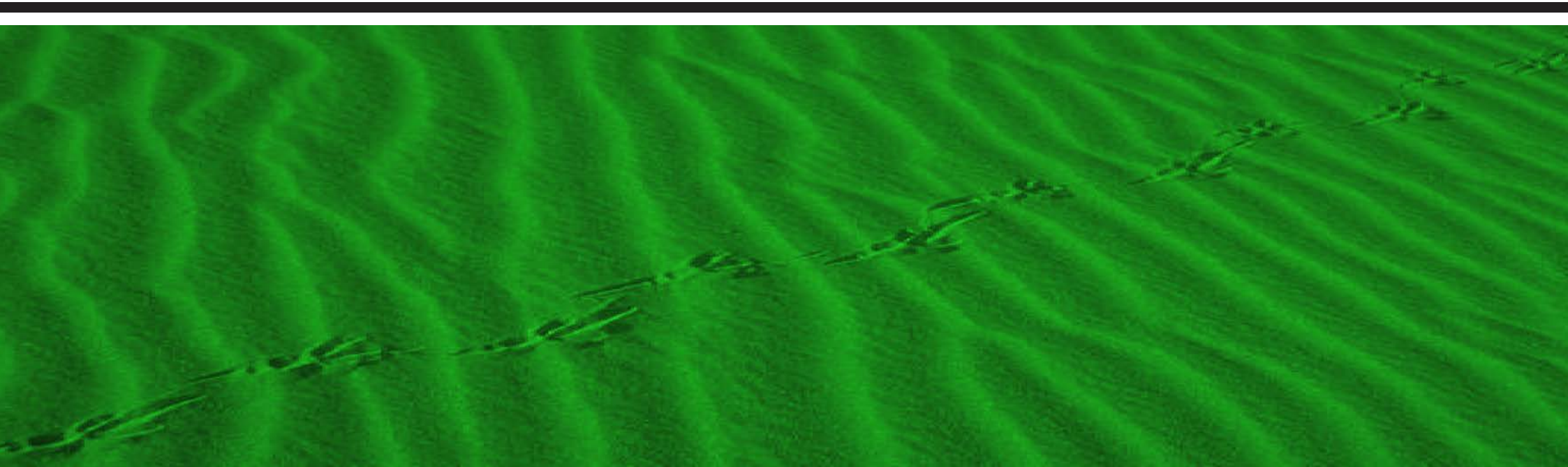


Human Capital Development Strategy Environmental Sector

A systems approach to skills development to support the Environmental Sector Strategic Plan

2009 - 2014



environmental affairs

Department:
Environmental Affairs
REPUBLIC OF SOUTH AFRICA

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1. Introduction and Background to this document

Policy context

This Human Capital Development Strategy (HCDS) arises out of the constitutional imperative for a clean, healthy environment that benefits current and future generations, and the impetus to strengthen opportunities associated with a green economy for South Africa. Its time frame is 2009-2014, which is aligned with the MTSF of 2009-2014. The MTSF prioritises skills development in South Africa, and emphasises the importance of quality in the education, training and skills development process. South Africa has developed a suite of legislation associated with the National Environmental Management Act No. 102 of 1998. The implementation of this legislation remains a work in progress and cannot be done without adequate attention to human capital development. The National Human Resources Development Strategy for South Africa (2009-2014) identifies the importance of implementing skills development initiatives that respond to South Africa's social and economic needs, and development of skills that improve service delivery.

Significant to this HCDS is the Human Resource demands of achieving the **Delivery Agreement for Outcome 10**, which focuses on environmental assets and natural resources that are valued, protected and continually enhanced. Outcome 10. This HCDS particularly addresses human capacity development to ensure a sustainable supply of human resources for achieving Output 2, 3 and 4 of the Delivery Agreement. Throughout the Delivery Agreement, there is mention made of the need for specific skills development initiatives to ensure a sustainable supply of the necessary skills required for implementing the targets of the agreement, indicating a systemic need for giving attention to the issue of skills development. However, as in most other environmental sector plans, specific skills are identified for specific shorter term targets, with inadequate attention given to the systems needed to ensure such skills development – both in the short and longer term. This HCDS therefore provides a more holistic and systemic approach to dealing with the skills

demands that are identified in the Delivery Agreement for Outcome 10, as well as the Strategic Plan for the Environmental Sector (2009-2013). The DEAT Environmental Sector Skills Plan (DEA, 2010) findings are relevant here, as they indicate the need for a **systemic approach** to addressing human capital development needs for the environmental sector.

The environmental sector is a rapidly emerging sector, and environment is a cross cutting issue, and environmental skills development crosses different sector education and training authorities (SETAs). The environment was not included in the National Skills Development Strategy (NSDS) I or II. In accordance with the Department of Environmental Affairs Environmental Sector Skills Plan (DEA 2010), this Human Capital Development Strategy supports the inclusion of environmental sector and green economy skills development in NSDS III. Prior to 2009 there was no comprehensive skills planning for the environmental sector in South Africa, and in 2009/10 DEA undertook to establish what the major skills development needs were in the environmental sector in South Africa. The Environment Sector Skills Development Plan (DEA, 2010) emphasises the need to address skills development issues within a systems framework. It recommends the

development of **Human Capital Development Strategies** to implement the Environmental Sector Skills Plan at various levels of the sector, and for various purposes. It specifically recommends the development of a Human Capital Development Strategy (HCDS) for the Environmental Sector that will strengthen implementation of the Strategic Plan for the Environmental Sector (DEA 2010) and that will address sector *wide* skills development issues. The ESSP provides the background research and information necessary for development of such a Human Capital Development Strategy.

This Human Capital Development Strategy is directly aligned with, and addresses the need for human capacity development based on:

- The Strategic Plan for the Environmental Sector that emphasises the need for capacity building particularly for vertical and horizontal environmental

- governance in the public sector; and
- The Environmental Sector Skills Plan for South Africa that proposes a systems approach to skills planning and human capital development, and which provides detailed insight into some of the issues influencing capacity building in the environmental sector, with emphasis on the public sector.

The environmental sector, as defined in this document is based on definition of the sector as provided in the National Environmental Management Act no. 102 of 1998 (NEMA) discussed below.

The legislative framework and skills development demands

Section 24 of the Constitution of South Africa (RSA 1996) enshrines the right of every citizen to an environment that is not harmful to his or her health or well being, and it commits the country to conservation and sustainable management and use of natural resources, as follows:

Everyone has the right:

- a) To an environment that is not harmful to their health or well-being; and
- b) To have the environment protected for the benefits of present and future generations through reasonable legislative and other measures that:
 - i) Prevent pollution and ecological degradation
 - ii) Promote conservation
 - iii) Secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.

The mandate of the Department of Environmental Affairs is to provide the legal and institutional framework necessary for realising this constitutional mandate. Since the promulgation of the National Environmental Management Act No 102

of 1998 South Africa has developed and implemented a comprehensive new environmental policy and legislative framework. The legislative mandate, with its emphasis on a people-centred approach to environmental management and sustainable development of society, has introduced new skills development demands in the environmental sector. These skills are needed for vertical and horizontal integration of the sector mandate, within a framework of co-operative governance.

Environmental sector skills development planning has not 'kept apace' of the rapid changes in the environmental sector which are based on the introduction of transformative legislation, and new environmental challenges. This has resulted in a skills development regime that is *reactive to legislation*, with sometimes serious consequences such as in the case of Environmental Impact Assessment legislation, which suffered from inadequate capacity for implementation. The DEA Environmental Quality and Pollution directorate consequently had to embark on skills development initiatives to strengthen Environmental Impact Management capacity in South Africa. A similar challenge faces many other stakeholders in the environmental sector where for example big industry reports inadequate technical skills to implement new environmental management, cleaner production and low carbon economy strategies (DEA, 2010). There is an urgent need to work towards a *more proactive, integrated approach to skills development* in the environmental sector, to address 'skills development lag', and/or duplication of effort. This requires co-ordination with the education, training and skills development systems and structures, and reflects the intention for co-ordinated, co-operative governance in the MTSF.

This HCDS is also directly relevant to provincial and local government strategy and planning. Skills development demands outlined in this document were established in consultation with provincial government, and local government, and took account of the specific needs identified at provincial and local government level. Tools for skills development planning are provided in this document that are relevant at all levels of government planning and service

delivery. For example, lists of scarce and critical skills are provided that can be used at all tiers of government to prioritise skills development spending and resource allocations for skills development. Local and provincial government planners, HR Directorates and skills development facilitators are therefore encouraged to use the objectives, tools and action strategies for planning provincial and local level skills development initiatives, and particularly to guide how skills development resources are allocated to ensure effective service delivery and governance. The HCDS therefore provides a system wide perspective of the most significant skills development interventions required, which can be applied at all levels of governance.

The Strategic Plan for the Environmental Sector (2009-2014) and this HCDS

The key goals and priority areas of the Strategic Plan for the Environmental Sector (2009-2104) are to:

- 1) Provide leadership and coordination of government's approach to large, complex and cross-sectoral issues affecting the environment, as per the MTSF, and
- 2) Effectively implement its own sectoral mandates within the context of new and evolving regulatory frameworks with additional responsibilities, striking a balance between capacity constraints and opportunities.

Three inter-related issues have been highlighted that are of concern to the sector as a whole. These require action across all of its institutions and strong leadership (which will require skills for such leadership) must be provided within government and society as a whole by the sector. These issues are:

- 1) Implementation of sustainable development,
- 2) Developing appropriate responses to climate change, and
- 3) To pursue and explore the concept of green jobs and promote a green economy.

These issues have implications for social and economic development. These issues are 'cross sectoral' from a governance perspective, and require skills for integrating these issues into the governance system as a whole, and into society and the economy more widely. The Strategic Plan for the Environmental Sector (2009-2014) identifies the importance of **building capacity for environmental governance**. It proposes the development of a **National Strategy for Capacity Building**, of which this HCDS forms an important part. The targets for capacity building within the Environment Sector Strategic Plan are to:

- Achieve increased awareness, understanding and integration of environmental issues within institutions and planning processes.
- Achieve a measurable increase in capacity (of officials, institutions and politicians) – resulting in increased effectiveness in performance of functions across the sector.
- Achieve increased participation in environmental consultation processes as a result of increased capacity of stakeholders.
- Carrying out skills and capacity assessments (audits) for all environmental institutions at national and provincial level.
- Ensuring that environmental skills and capacity are adequately assessed via the Competency Framework established through the National Government Skills Audit for local government (CoGTA).
- Developing and implementing a national strategy for support and capacity building for the environmental sector – to cover all spheres of government and focussing both on environmental officials and other officials and politicians.
- Approving and implementing the Local Government Support Strategy for Environment and Tourism sectors – and ensuring that this is aligned to the Five Year Strategic 'Turnaround Strategy' for Local Government (with intention of integrating this into a wider support and capacity building strategy for the sector once it is prepared) (CoGTA, 2009).
- Building on existing programmes and approaches – and incorporating lessons learned into new approaches.

- Reviewing the role of Community Environmental Workers with a view to increasing their effectiveness in capacity building and support.
- Establishing a reporting, monitoring and evaluation system to monitor the effectiveness of the capacity building strategy (and its activities) on an on-going basis.
- Achieving integration / mainstreaming of environmental capacity building into existing support and capacity building programmes for local government – particularly those emanating from: Five Year Strategic Framework for Local Government National Skills Development Programme.
- Ensuring capacity building (e.g. skills transfer, building of institutional capacity) is an integral component of any support projects or other out-sourced projects commissioned by the sector.

It aims to achieve this by:

- Increasing the use of learnerships and bursaries as a means of increasing access to the sector at entry level.
- Developing strategies and approaches for increasing staff retention.
- Increasing access to environment related information by all stakeholders.
- Developing a national strategy for capacity building of all stakeholders (concerning topic specific strategies).

This Human Capital Development Strategy provides further definition to the above, and provides strategic direction on how to address the capacity development issues in the environmental sector, from a *human capital development* perspective. It should be noted here that other important aspects of capacity development e.g. institutional development, resourcing and infrastructure development are equally important within a National Strategy for Capacity Development. These need to be included in a National Strategy for Capacity Development and should *complement* this HCDS to ensure a sustainable context for skills development.

In particular, the Strategic Plan for the Environmental Sector identifies the following issues associated with capacity building in the environmental sector,

which have implications for human capital development strategic planning, and thus for this HCDS:

- Skills development is needed to support Green Jobs and a Low Carbon / Green Economy.
- There is a need for co-ordinated cross sectoral skills development response to address climate change risk and opportunities from amongst others the energy, agriculture, built environment, information and communication technologies, infrastructure, transport and manufacturing technology sectors, and the institutions and quality assurance bodies (SETAS) that offer education and training to these economic sectors. Such training interventions need to address both climate mitigation and adaptation.
- There is a need to develop skills for implementing the National Sustainable Development Framework five priority areas, and the MTSF strategic priority 9, focussing on sustainable resource management and use. Here particularly sustainable development planning and technology skills are necessary.
- There is a need for skills development initiatives that increase the effectiveness of delivery of sectoral mandates, particularly for core focus areas that have been identified for the sector which include:
 - o Air Quality- here the shortage of air quality specialists and air pollution control officers needs to be addressed, as well as capacity for air quality licencing and management at provincial and local government levels
 - o Waste and Chemicals Management – here there is a need to build capacity across the waste sector in South Africa for a ‘cradle-to-cradle’ approach to waste management in line with new legislation.
 - o Pollution Incident management
 - o Environmental Impact Management
 - o Conservation and Sustainable Use of Biodiversity
 - o Marine and Coastal Management

- There is also a need to develop skills for achieving strategic goals, particularly effective institutional frameworks and legislation (i.e. legislative and compliance skills); integrated planning skills (i.e. sustainable development and green economy planning skills); participation, empowerment and awareness (i.e. environmental education, training and community empowerment skills); skills for strengthening information management and international co-operation.

The Strategic Plan for the Environmental Sector (2009-2014) has identified a number of core focus areas aligned to core areas of statutory responsibility, with key priorities for the 5 year framework of implementation, outcomes, activities, targets and responsibilities for delivery, with indicators for monitoring and evaluation. Various capacity building and training initiatives have been identified as priority interventions over the next five years. These are:

- 1) **Waste Management:** The need to build capacity across the sector – particularly at local government level - for ‘cradle to cradle’ approaches to waste management, as defined in the NEMA NWA. Most skills in the waste sector are oriented towards end of pipe approaches to waste management, and all skills need to be changed to incorporate waste avoidance approaches. Local government officials in particular need to be supported to adopt new approaches through KPA revisions, but also through training and capacity building. Remediation skills also need to be extended. Public education and participation in local waste avoidance, re-use, recycling and composting programmes is also needed.
- 2) **Air Quality:** The training of Air Quality Specialists, and Air Pollution Control Officers, and the training of municipal and provincial officials in atmospheric emission avoidance, licencing, compliance monitoring and enforcement – particularly the 23 District Municipalities that have been identified as having poor or potentially poor air quality. This focus area plans to train 100 officials by 2011 via the APPA registration certificate review process. Public education is also needed to address poor indoor and ambient air quality in dense, low income settlements (coupled with provisioning of alternative energy resources).
- 3) **Pollution Incident Management:** Skills for pollution incident management are needed across spheres. National and provincial government have responsibilities for pollution incident management, and local government requires skills to assist with provision of emergency services if required. Guidelines will be developed that can be used in training, including training for management of coastal zone incident management under ICMA.
- 4) **Environmental Impact Management:** There is a need to ensure embedded capacity within mandated agencies (i.e. adequate scientific and decision making skills) for assessing environmental impacts. Skills are needed to ensure greater consistency in quality of authorisations through the EIA process, and skills need to be developed to develop and use a wider range of EIM tools. Skills for compliance monitoring also need to be developed. Skills need to be developed amongst regulators, practitioners and interested and affected parties. Training of administrators in the regulations and the application of administrative systems and processes is a high priority, and provincial courses are being planned. More deliberate efforts to strengthen public understanding and participation are needed. Best practices, guidelines and manuals with standard operating procedures will be developed and these can be used in training. Report writing to ensure accurate reports first time is a critical skill that needs to be provided for. National and provincial government will need to work with local government to strengthen its capacity and understanding of the EIM processes, and to integrate EIM decision making processes into IDPs and other strategic planning frameworks. A provincial level EIM capacity audit and needs analysis is being planned to inform training and capacity building. A new training course on EIA regulations is also being planned, and a training course for Interested and Affected Parties Environmental Impact Management Capacity Building is being planned.
- 5) **Conservation and Sustainable Use of Biodiversity:** A human

capital development strategy for improving management and research skills in the biodiversity sector is being developed. New skills need to be developed within the biodiversity sector to accommodate Type 1, 2 and 3 conservation activities (within statutory areas, less formal protected areas, and informal landowner conservation activities). New approaches to conservation also need to be introduced into training and capacity building systems, most notably trans-frontier conservation, bio-regional conservation planning, and ecosystem service approaches to conservation, and skills need to be developed in all of these new areas. Skills for understanding and managing climate change impacts on biodiversity also need to be developed. Skills development priorities need to be developed to align with the priorities for implementation identified in the National Biodiversity Framework published in August 2009. Research capacity, particularly in the areas of taxonomy and ecosystem services management needs to be developed. Capacity for spatial biodiversity planning and management needs to be developed in a wider range of provinces as an immediate priority. While the South African National Biodiversity Institute's (SANBI) support and leadership is highly valued, greater capacity needs to be developed at provincial level for practical implementation of conservation priorities. Skills for compliance monitoring (Environmental Management Inspectors) also need to be developed. Transformation of the biodiversity sector needs to be prioritised in capacity building programmes. At local government level, there is a need to build capacity for integrating biodiversity concerns into Integrated Development Plans (IDPs) and Spatial Development Frameworks (SDFs) for municipalities, and to ensure that systems are put in place for the control and management of priority resources at the local level. Improving knowledge of sustainable extractive use of biodiversity, and establishing and strengthening provincial stewardship programmes are also priorities for capacity building in the biodiversity sector.

- 6) **Marine and Coastal Management:** Research capacity is needed to monitor fish stocks and to detect over-exploitation or negative effects on

the integrity of the marine ecosystems, and to understand the influence of climate change on the marine and coastal environment. Modelling skills for determining Total Allowable Catch (TAC) and Total Allowable Effort (TAE) are needed. Skills for implementing an ecosystem approach to MCM are also needed. MCM is experiencing critical capacity and resourcing challenges in the area of compliance monitoring, and more Fisheries Control Officers are needed. Additional technical and enforcement skills are urgently needed in the sector. Community-based monitoring skills also need to be developed in the context of the Expanded Public Works Programmes (EPWP), and this will require training and capacity building. Skills for development of responsible aquaculture activities are also needed. Skills at provincial and local government level need to be developed for coastal management planning, which emphasises sustainable development planning for the coast. Training of Fisheries Control Officers is a priority and an initiative is underway to strengthen and provide the specialist training and development required by FCOs.

- 7) **Training to promote and strengthen enforcement and compliance:** There is a big drive within government to address the problem of insufficient staff to tackle the large scale nature of the task of ensuring adequate enforcement and compliance. Increasing compliance levels will necessitate a much higher level of pro-active compliance monitoring (e.g. routine inspections). There are severe technical skills shortages for carrying out monitoring and enforcement activities (e.g. process engineers, biodiversity specialists, EIM experts etc.). Little capacity is being built for voluntary compliance. Basic training courses have been developed and designed for EIMs (by the EQP branch in DEA) and EIMs have been designated in institutions across the country. There is, however, a great need to extend the training of these officials to provide them with the knowledge of standard operating procedures and the technical skills required to implement compliance and enforcement responsibilities effectively. Capacity for using Joint Enforcement Programmes needs to be further developed. A more sustainable system

of funding EMI training is needed, and a re-examination of funding systems for EMI training is underway. Air, Waste and EIA related monitoring training is also receiving attention across the sector. DEA is carrying the responsibility for developing procedures and systems and for training officials in other institutions within the Directorate Compliance Monitoring. More sustainable, long term systems of capacity development need to be built in the South African Education and Training system for compliance monitoring technical skills. Skills development programmes are also needed for awareness raising of the judiciary.

As can be seen from the above, each 'focus area' is effectively busy developing its own human capital development strategies, mainly with a focus on training provisioning for key priority areas. All areas are targeting provincial and local government. There is, however, a need to consider the following common strategy across all of the above focus areas, in order to assess whether the training programmes are co-ordinated (since many target the same end-users, particularly at local government level), and to consider whether a sustainable capacity building system for the environmental sector is being put in place. Questions to help develop such a framework could include:

- Is a sustainable system of training that makes appropriate use of the skills development system instruments and funding mechanisms (e.g. learnerships, qualifications, skills programmes etc.) being established?
- Are high quality training materials being produced for use in the training system, and are there adequately qualified trainers and enough training institutions with capacity to offer high quality training in these areas on a sustainable, ongoing basis?
- Is the training of officials in provincial and local government contexts co-ordinated and is duplication and 'over-targetting' of the same people being considered and minimised?
- Is adequate attention being given to public empowerment and education skills to focus on impact reduction and public co-operation in implementing

new environmental mandates, and public participation in sustainability practices and environmental impact management?

- Is adequate attention being given to sustainable workplace support in the form of mentoring and high quality workplace skills planning and other strategies to ensure the successful application of learning and improved efficiency of workplace skills planning instruments and budgets?

These are prioritised within this HCD, along with priority systemic interventions that address the wider skills system ecology, with a view to ensuring longer term catalytic impact.

The Environmental Sector Skills Plan for South Africa and this HCDS

A number of critical issues relevant to this HCD have been raised in the *Environmental Sector Skills Plan for South Africa*. They are:

- Environmental sector skills development planning has not kept 'apace' with the rapid changes in the environmental sector, as reflected in transformative legislation and new environmental challenges. As a result the environmental sector is characterised by a skills development regime that is reactive to legislation. There is an urgent need to work towards a more *pro-active, integrated approach to skills development* in the sector, to address skills development lag, and/or duplication of effort and systemic inefficiencies.

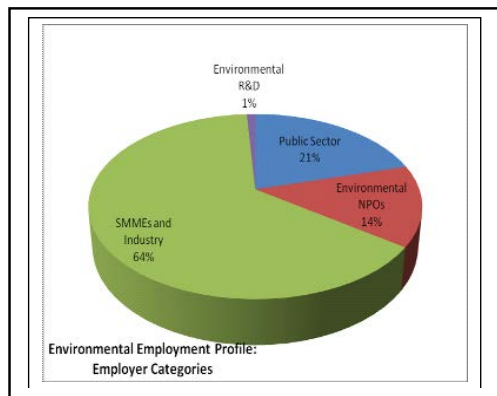


Figure 1: Environmental Sector employment profile (DEA, 2010)

The employment profile of the environmental sector shows that the private sector is the largest employer of environmental skills (SMMEs and big industry – 64%); followed by the Public Sector (national, provincial, local government and parastatals – 21%) and environmental Not for Profit (NPOs) organisations – 14%), with environment related Research and Development making up 1% of employment in the sector. All employers have skills development demands and responsibilities at high skill, intermediary and /or entry occupation level. The emphasis differs depending on the nature and purpose of different environmental institutions. For example, national government have a larger percentage of high skill employees, most environmental parastatals (except for SANBI) and local government have a small percentage of high skills employees, with the bulk of their employment being at entry occupation level. This creates different skills development challenges in vertical and horizontal governance patterns.

- There are five main drivers influencing skills development in the environmental sector namely:
 - **Macro-ecological drivers** which manifest in critical environmental issues and risks (critical issues such as climate change, loss of biodiversity, increase in waste etc.). These are linked to environmental

compliance drivers (environmental legislation) that requires skills for implementation and skills to assess and address the issues and risks comprehensively and effectively. This driver is creating the demand for risk assessment and management skills, and various types of environmental science, technology and management skills. As shown in the Strategic Plan for the Environmental Sector, there are very specific skills development demands associated with various environmental management foci / sub-sectors.

- **Macro-economic drivers** and the emergence of a green economy which includes efforts to formalise an Environmental Goods and Services Sector in South Africa (currently the EGS makes up an approximate R20 billion industry or 7% of GDP and is estimated to be growing, with potential to triple in size in five years). There is an emerging emphasis in South Africa on the green economy in industrial sector planning, and on 'Green Jobs'. Various studies are showing the potential for job creation based on newly emerging environmental foci, and on a new development paradigm based on 'decoupled growth', where growth is decoupled from heavy use of resources, but is based on seeking greater efficiency, while extending labour intensity. This driver is creating a demand for new skills, particularly environmental economics skills, new green technology development skills, SMME development skills, and sustainable development planning skills.
- **Mainstreaming of Environment into Development** requires integration of the environmental driver into all government and economic activities, including rural development. This creates skills demands for greening of existing jobs and skills for creating an environmentally literate society and workforce. It also requires skills for sustainable community-based natural resource management into focus in rural areas, where sustainable use of natural resources is key to maintaining and enhancing rural livelihoods. Such skills are therefore critical to rural development.

- **Research, Science and Technology drivers** are emerging as significant in the environmental sector, as three of the South African National Grand Challenges are environment related. The National System of Innovation is therefore intimately linked to environmental priorities – new energy resources, dealing with global (climate) change, and maximising the productivity of biological resources (while managing them sustainably). This national research agenda creates the need for high level scientific skills (social and natural science) development in and for the environmental sector.
- The **existing skills system and skills base** also provides a driver for skills development in the sector. South Africa has a history of unequal education, and poor quality education which affects the entire skills development pipeline. Environment is a 'new' focus in the South African education and training system, so many who enter the environmental sector are inadequately prepared for the complex range of environmental challenges and strategies that exist. This creates a need for ongoing in-service skills development, and for effective use of the skills development system. The skills development system in South Africa, is however, also still emerging, and has been characterised by various struggles for efficiency, accessibility and effective use of skills development instruments (e.g. learnerships). The current status of the skills development system, and the 'newness' of environment within this system, is creating the need for **high quality environmental education and training skills**, to service environmental skills development in the entire skills development pipeline.
- The DEA Environmental Sector Skills Plan highlights the **urgent need for giving attention to Human Capital Development needs in the public environmental sector** – at national, provincial and local government levels to strengthen service delivery. In particular there is a need to address the issues of supply and retention of **leadership skills** (senior management and skilled technical management leadership); **scientific technical and professional skills**, particularly black **women scientific and professional skills**, and environmental technical skills, as significant shortages of skills are experienced in these categories in the environmental sector. Vacancies in these categories have **increased over the past five years**, and the state system is increasingly becoming reliant on consultancy services for scientific services. Taking a 22% vacancy (the average vacancy rate of the Economic Cluster) as the 'norm', the ESSP reports an approximate vacancy level of **over 600 scientific positions** in national and provincial environmental government functions (excludes parastatals), and **over 800 environmental technical positions** (national and provincial government – excludes parastatals and local government technical environmental positions). There is a need to address these vacancies through pro-active skills development initiatives, in order to reverse this trend to ensure attraction and retention of adequate internal scientific capacity at national and provincial levels. There is also a need to **stabilise employment in the human resources system**, as high turbulence and turnover in this sector of employment in the public environmental sector affects the efficacy of employment procedures, and especially the filling of environmental occupation vacancies, which are identified in the ESSP as being high (average of 29% for environmental occupations across the public sector – average vacancies in the economic cluster is 22%). The **efficacy of workplace skills planning**, and expenditure of training budgets needs to be improved to *address the environmental mandate within a service delivery and performance related framework*, as large budgets are being spent on mainly generic types of training, often at levels lower than performance criteria demand.
- At **local government level**, there is a need to build capacity for integrated environmental management (that addresses all legislative requirements at implementation level), to strengthen capacity for sustainable development planning – urban and rural development planning, to strengthen environmental technical capacity, and to strengthen skills at entry occupational level, as this is where the largest percentage of

environmental employees work. The ESSP reports a 'neglect' of training of local government employees in environmental practices functions at entry occupation level.

- The Environmental Sector Skills Plan indicates the need for giving urgent attention to the development of **skills development planning infrastructure and competence for delivery of training and training capacity for green jobs and a green economy**. The Environmental Sector Skills Plan shows that while numerous green economy strategies and strategies for green jobs are emerging, very little attention is given to the *pro-active planning for skills development* needed to make these strategies work. Skills development system drivers also show that the environmental sector has, to date, lacked adequate capacity to make effective use of the skills development system instruments (e.g. learnerships), as for example, only 2.4% of learnerships listed are environmental learnerships (DEA, 2010), and many environmental qualifications (which in themselves remain inadequate for the sector) are under- or unutilised. This indicates that there is a need to build the capacity of training institutions, trainers and the SETA system to accommodate and pro-actively plan for and develop capacity for training provision for a green economy and for green jobs. While education and training institutions in South Africa show progress in 'greening' of courses and development of new environmental courses, quality is uneven, and delivery appears to be inadequate in terms of matching demand – i.e. there is a demand-supply mismatch. **The current range of learnerships for the sector is inadequate and more SETAS need to offer environmental learnerships for the green economy.**
- The Environmental Sector Skills Plan also indicates the need to address **internal workplace skills development planning processes** to improve the efficacy of workplace skills planning and expenditure on training in the environmental sector. Evidence shows that workplace skills planning is compliance driven, rather than mandate driven, and that while large amounts of money is being spent on training, the training is not clearly aligned with KPAs or performance-based outcomes. Training paid for by workplace skills planning linked budgets tends to be more generic, and most such training is levelled at Levels 1-4 on the NQF, while many employees attending such training are employed with Levels 6-8 NQF

qualifications. While it is conceivable that some courses need to be pitched at introductory level for particularly purposes of learning a new skill, there is also a need for a greater alignment with level of employment and level of skills training being offered, *as well as skills training and its relevance to KPAs and performance outcomes*. Skills development in workplaces seems to be provider driven (i.e. available accredited courses) and a lack of specific mandate-based information on skills needed.

- Aligned with the Strategic Plan for the Environmental Sector, the Environmental Sector Skills Plan also indicates the need for development of **skills for mainstreaming climate change, sustainable development and green economy into government and economic systems** (i.e. mainstreaming environment into development). This requires development of *new skills* in the environmental sector such as risk assessment and management (expressed as a need across the environmental sector), sustainable development planning skills (also expressed as a need across the environmental sector); and environmental economics skills (also expressed as a need across the environmental sector). While current employment categories do not always exist for these skills, new positions are beginning to open in these areas, and existing occupations (e.g. urban planners; economists; environmental managers etc.) are having to re-orient or re-skill themselves with these new foci. This creates a demand for *re-orientation of existing training and capacity in these areas*, as well as development of new training programmes in these areas.
- Given the emphasis on **quality of education and skills development** outlined in the MTSF, the Environmental Sector Skills Plan also emphasises the need to address and improve **quality** of environmental education and training at all levels of the system. It recommends interventions to this affect throughout the system, and this includes the quality of career guidance to attract suitable incumbents into the environmental sector.

This HCD addresses these issues through a systems approach to skills development, as recommended in the Environmental Sector Skills Plan for South Africa.

2. Vision, Strategic Objectives and Principles

A systems approach

As indicated above the Environmental Sector Skills Plan identifies critical issues affecting the **skills system** in the environmental sector. Most Human Capital Development planning in South Africa focuses on training provisioning, quantified in numbers of people to be trained over a period of time. While necessary, this represents a short term and fragmented approach to HCD development, and is an inadequate response to addressing the more complex skills development crisis in South Africa, and in the environmental sector in particular. Such approaches to human capital development fail to address the systemic context in which skills are located (i.e. the workplace skills development context), and the need for *futures thinking*, and *pro-active initiatives to provide for futures skills needs* (e.g. the Training of Trainers to offer training for an emerging sector's needs). Based on the extensive research undertaken for the Environmental Sector Skills Plan which was complemented with additional research into the workplace skills environment (e.g. retention, mentoring and workplace skills planning and quality related issues) undertaken specifically for this HCD, this HCD focuses on the **system of skills development** and proposes various interventions to ensure a more sustainable skills development context for the environment sector. It addresses skills needs at high, intermediate and entry occupation level, and addresses the various priorities identified in the Environmental Sector Skills Plan (DEA, 2010) within a framework of priorities identified for implementation outlined for the Strategic Plan for the Environmental Sector (2009-2014).

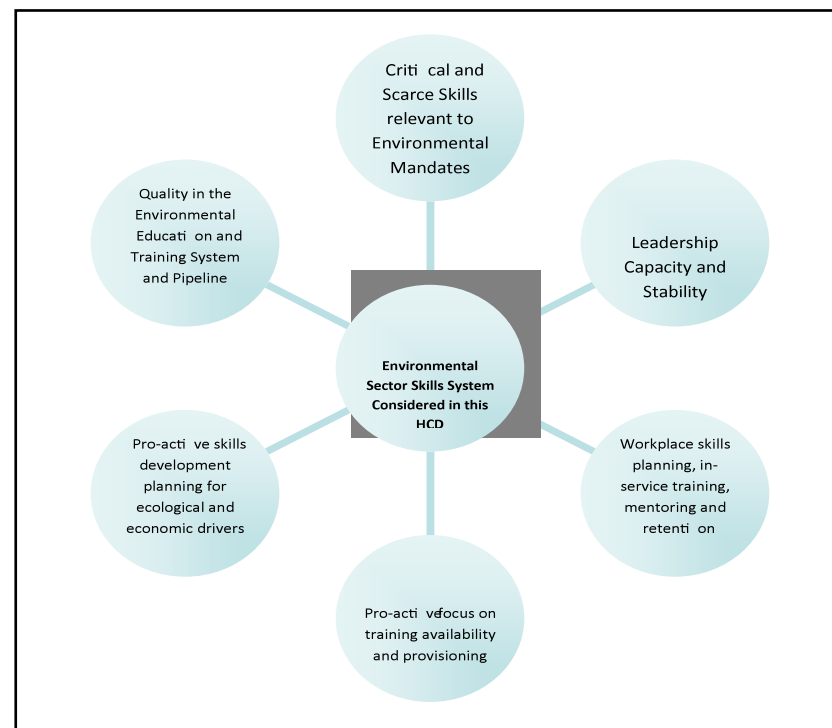


Figure 2: Systems approach to Human Capital Development

Based on this systems approach, this human capital development strategy is focussed on both:

- 1) training programmes **to address scarce and critical skills gaps**, and
- 2) various **strategic skills systems interventions** that are pro-active, and that will have catalytic and longer term impacts in order to ensure that a sustainable system of training will exist for the environmental sector.

Vision

To strengthen human capital within the environmental sector to lead mainstreaming of climate change and sustainable development in government

and the economy, and to effectively implement the national environmental mandate.

Strategic Objectives

1. Support skills development for green jobs and a green economy
2. Strengthen leadership skills for sustainable development planning and climate change risk and opportunity assessment
3. Address the scarce and critical skills gaps in the public environmental sector for improved vertical governance
4. Strengthen a systems-based approach to human capital development within the environmental sector

Principles

This HCDS is based on the principles for Human Capital Development Strategies recommended in the DEA Environmental Sector Skills Plan. These principles are recommended in the ESSP to ensure **synergy and coherence** in Human Capital Development Strategies in the Environmental Sector.

- **Principle 1: Systems Approach:** This principle requires HCDS to give attention to the **skills system** in the environment sector. It intends to address the problem of fragmented and narrow approaches to skills development. The purpose of a systems approach to skills development is to address issues at all levels of the skills development ecosystem (e.g. in training organisations, and in workplaces, and at the interface between the two). The systems approach also requires giving attention to the mix of high, intermediate and entry level skills needed in the environmental sector.
- **Principle 2: Multi-levelled transformation:** This principle requires HCDS to give attention to the ongoing need for transformation in the environmental sector, and to prioritise skills development initiatives in areas where transformation targets are difficult to achieve. It requires a view of transformation that addresses employment equity compliance as

well as transformation of knowledge and practice in the sector.

- **Principle 3: Quality and Quantity Balance:** This principle requires that HCDS give equal attention to numbers of people trained, particularly in categories of scarce, critical and innovation skills needed for the sector, while *at the same time*, giving attention to the quality of the training interventions being offered. Quality should become a principle of practice in all interventions supported by the HCDS.
- **Principle 4: Pro-active Futures' Orientation:** This principle requires that HCDS consider not only the current and existing needs for skills development, but also interventions that will strengthen a *pro-active, futures' orientation* to skills development in the sector (e.g. leadership or sustainable development planning skills).
- **Principle 5: Mainstreaming of environmental skills into government, society and the economy:** This principle requires that HCDS give attention to the development of new skills needed in the sector, *as well as* the greening or re-orientation of existing skills to integrate environmental concepts and practices into all walks of life and into a diversity of occupational categories. For this various skills systems interventions are needed.

The following framework is used to differentiate skills levels in the ESSP, and also in this HCDS.

Table 1. Category framework used to differentiate skills levels in the ESSP (Kraak, 2008, revised according to new NQF levels); DoL, 2008

Education Band	NQF	Qualification Type	Skill Band
Higher Education and Training	10	Doctorate	High Skills
	9	Masters Degree	
	8	Postgraduate Diploma /honours	
	7	Bachelors Degree / Advanced Diploma	
	6	Diploma / Advanced Certificate	
Further Education and Training	5	Higher Certificate or Advanced National Certificate (Vocational)	Intermediate Skills
	4	National Senior Certificate (Grade 12) or College National Certificate 3 (Vocational)	
	3	College National Certificate 3 (Vocational) or Grade 11	
	2	College National Certificate 2 (Vocational) or Grade 10	
General Education and Training (including ABET level 1-4)	1	Grade 1-9	Entry level skills

3. Strategic Objectives and Strategies for Implementation

Strategic Objective 1: Support skills development for green jobs and a green economy

The Environmental Sector Skills Plan and the Strategy for the Environmental Sector both emphasise the importance of supporting skills development for green jobs and the green economy. This objective does not focus on *specific skills* for a green economy or specific green jobs (which needs to be done through specific green economy skills strategies and specific SETAs). **It rather focuses on wider systemic issues that will facilitate SETAs uptake of green economy skills planning and provisioning**, and also pays attention to catalytic / systemic interventions needed to provide **for entry level occupation skills development for green jobs and local and provincial government service delivery**. It does not focus on the provision of training for these per se, but emphasises that **more SETAs need to get involved in learnerships and skills development for the green economy**.

A number of key areas for skills development support were identified in the ESSP, and the Strategic Plan for the Environmental Sector:

- Interventions are needed to integrate **the environmental driver into the National Skills Development Strategy, into SETA Sector Skills Plans, and into the Occupational Learning System**, including curricula of FET Colleges.
- **Provincial green economy and other sub-sectoral green economy strategic planning** is taking place (e.g. plans for formalising the recycling industry). The ESSP identified that green economy strategies, while pointing to significant potential for job creation in new areas (e.g. solar water heating, renewable energy, urban agriculture etc.) lack *integrated skills development strategies to provide for the skills needed to actualise the opportunities outlined in the green economy strategies*. Capacity needs to be developed to integrate such skills planning into green

economy strategies. This includes capacity to cost the skills development needs of the green economy strategies, and to mobilise the resources that exist in the current skills development system (e.g. SETA funds) for skills development initiatives that can support green economic strategies. It may also require partnerships with SETAs to invest in 'training of trainers' programmes to provide new forms of skills training.

- The ESSP recommends that attention be given to **sustainable training pathways** that may be linked to existing EPWP training initiatives. It recommends development of Environmental Practice **1, 2, 3 and 4 skills development programmes and/or learnerships** to be linked to sustainable job opportunities that could be linked to EPWP programmes, particularly for filling entry level occupational vacancies (e.g. conservation worker vacancies) and for supporting new jobs (e.g. new waste management / recycling industry jobs) at entry level. **There is an urgent need to develop new learnerships and skills programmes in the area of environmental practices.**

Objective 1, Action 1: Support integration of the environmental driver into the National Sustainable Development Strategy and the Occupational Learning System

This action requires high level systemic intervention to ensure that SETA system funding will be available for green job skills development in the occupational learning system (i.e. in a range of SETAs). Green Economy Strategies show that a number of different SETAs need to be involved in (e.g. AgriSETA for urban agriculture jobs; LGSETA for waste management jobs; and MERSETA for solar heating and new energy technology jobs etc.). For coherence across the SETA system, there is a need to **ensure that the environmental driver** is included in the NSDSIII, and integrated into the Sector Skills Plans of the various SETAs. This requires engagement with the National Skills Authority (NSA), and with NSDSIII stakeholders including business and labour. It also requires engagement with the SETAs themselves, to develop knowledge of, and understanding of how the green economy will influence their planning

and work. It also requires engagement with the Ministry of Higher Education and Training and the Qualifications Council for Trade and Occupations and Umalusi, to ensure appropriate content and quality criteria are included in environmental sector training and associated institutions. This is to ensure longer term sustainability of environmental training provision. A priority here would be to ensure that training becomes available for environmental technical skills – particularly intermediate level skills for air quality, coastal, waste, water and biodiversity monitoring, as these were identified as scarce skills that are needed at provincial and local government level in the public sector (the ESSP identified a shortage of over 800 environment technicians in the public sector system).

Objective 1, Action 2: Support the development of a Training of Trainers Programme to expand Provider Capacity for Green Jobs and Green Economy Training and Capacity Development

This action addresses the current inadequate capacity for delivery of green jobs and green economy training in the system. This lack of capacity includes quality issues and capacity for offering sustainable training for EPWP programmes and other green jobs initiatives (e.g. appropriate learnerships). The ESSP shows that there is a lack of capacity in the environmental sector to use the skills system instruments such as learnerships, skills programmes and skills funding that is available in the skills system for providing relevant accredited training programmes. The ETDP SETA has qualifications registered for Environmental Education, Training and Development Practitioners. These qualifications are in use, but require funding to be allocated for their use through the ETDP SETA (the ETDP qualifications are currently funded from other sources, because the environment driver has not been included in the NSDSII, and is not prioritised in the ETDP SETA Sector Skills Plan). The Environmental Education, Training and Development Practices standards need to be revised to have a stronger focus on green jobs training, EPWP training and green economy training (i.e. learners coming off these qualifications should be able to use the NQF system, and should be able to offer high quality accredited training that will strengthen green jobs delivery, and the green economy).

A partnership needs to be established with the ETDP SETA to revise the standards, and to facilitate better and more efficient use of the qualifications and standards through improved curriculum design. Of critical importance, is to include these qualifications in the ETDP Sector Skills Plan, so that funding from the skills system is allocated to them, and that they cease to be outside donor funded, but are internally funded within the ETDP SETA.

Objective 1, Action 3: Develop national materials for use with Environmental Practices Level 1, 2, 3 and 4 Learnership / Skills Development Programme/s to strengthen access to new entry occupation green jobs (e.g. recycling jobs), and green jobs in municipalities

This action addresses a lack of attention given to entry level occupation development in the environment sector. Qualifications for level 1, 2, 3 and 4 exist for **Environmental Practices** (these qualifications can be contextualised for a variety of environmental practice occupations such as recycling, conservation and parks servicing, alien invasive species eradication, coastal zone monitoring etc. entry occupations) if learning materials and curricula are carefully developed. The ESSP reports that while these and other relevant qualifications are registered and available for use within various SETAs they remain un- or under-utilised. There appear to be difficulties in translating qualifications into appropriate course materials and assessment activities. As indicated above, the sector lacks adequate capacity for this task.

This HCDS action suggests that DEA takes the lead in forming and working within a partnership with the COGTA, relevant SETAs (especially LG SETA; CATHSETA) and a providers network to facilitate the development of nationally available materials (provided in up to 5 African languages) for learnership and skills programme training development for environmental occupations at levels 1, 2, 3 and 4. The focus should be on Environmental Practices Occupations and Training in different contexts at entry occupation level that focuses on improvement in environmental service provision and new entry green jobs development.

The provision of the materials in African languages is critical as reports on training in provided at entry level shows that training is often inaccessible as much of it is provided in English. This initiative should be carefully designed to support:

- Local government entry occupations involved in environmental practices such as waste management, recycling, sanitation management and greening to improve the quality of current practices and to achieve service delivery gains through improved practice.
- Sustainable learning pathways linked to EPWP programmes and other job creation opportunities to strengthen green jobs development.

These materials should become available to a range of national and local service providers who are supporting green jobs skills development at entry level, to support the use of quality materials for environmental sector training. Efforts should also be made to Train Trainers *in how* to use the materials (i.e.

link this initiative to Action 2 above).

The ESSP shows that there are potentially over 100 000 people that can benefit from such an initiative to strengthen environmental practices training at entry occupation level immediately (employees in local government and others), and with the expansion of green jobs at entry occupation level, the EPWP programme could potentially provide access links to sustainable learning pathways and jobs for many more learners who could benefit from this initiative. These materials could also be integrated into FET College curricula for longer term sustainability of the training provisioning. This will require engagement with FET Colleges interested in offering the training programmes, and it would be important to involve the FET colleges (and the MHET), along with SETAs at the start of the initiative to design the curricula and materials to be used.

Table 2: Implementation Actions for Strategic Objective 1: Support skills development for green jobs and a green economy

Implementation Actions for Strategic Objective 1	Activities	Processes	Indicator
Objective 1, Action 1. POLICY INTERVENTION: Support integration of the environmental driver into the National Sustainable Development Strategy and the Occupational Learning System	1.1 Support the integration of the environmental driver and green economy priorities in NSDS III and SETA Sector Skills Plans	Engage with relevant stakeholders to outline how the environmental driver can be integrated into NSDS III and associated SETA Sector Skills Plans. Develop guidelines for SETAs on how to integrate the environmental driver into Sector Skills Plans	Environment is included into NSDS III and Sector Skills Plans (2011), as recommended in the ESSP.
	1.2 Support integration of the environmental driver into the Occupational Learning System	Engage with the Ministry of Higher Education and Training and QCTO for partnership intervention to strengthen the environmental content and focus in the OLS and FET College Curricula	Environment integrated into the Occupational Learning System for key green job sectors and environmental technical skills (by 2014).

	1.3 Develop green economy skills planning guidelines for distribution to SETAs and to green economy partners.	for targeted green job sectors and for environmental technician functions at provincial and local government level. Establish a task team to demonstrate (using some case studies) how to cost and integrate skills planning into green economy studies. Develop guidelines for national distribution.	Green Economy Skills Planning guidelines used in green economy strategies by 2012.
<u>Objective 1, Action 2:</u> TRAINING SYSTEM INTERVENTION: Support the development of a Training of Trainers Programme to expand Provider Capacity for Green Jobs and Green Economy Training and Capacity Development	1.4 Develop a Training of Trainers Programme for Providers of Training for Green Jobs	Form a partnership with ETDP SETA and QCTA to revise ETDP standards, and to offer Training of Trainers Programme/s in the Occupational Learning System to extend capacity and improve quality of training for environmental service delivery, green jobs and green economy	Training of Trainer Programme exists as partnership with ETDP SETA 100 Training Providers have attended Training Quality of 50 environmental training programmes improved 30 new environmental training programmes exist

<p>Objective 1, Action 3: TRAINING SYSTEM INTERVENTION: Develop national materials for use with Environmental Practices Level 1, 2 and 3 Learnership / Skills Development Programme/s to strengthen access to new entry / entry level occupation green jobs (e.g. recycling jobs), and green jobs in municipalities</p>	<p>1.5 Develop high quality national materials for Environmental Practices Level 1, 2, 3 and 4 Learnership and/ or skills development programmes – Core Materials with applications to various environmental practice occupation contexts (waste, recycling, greening, coastal clean up etc). Align with EPWP focus areas and green jobs development strategies.</p> <p>This training can also be used for CBNRM in rural development contexts.</p>	<p>Form partnership with COGTA, relevant SETAs, and interested FET colleges to develop core materials for learnership and/or skills development programmes for Environmental Practices Level 1, 2, 3 and 4 qualifications to extend EPWP skills programmes, and to strengthen entry occupational environmental training in different environmental practice contexts (waste, biodiversity, coasts, greening, alien clearance etc). Integrate these qualifications into FET Colleges, and make available the materials to FET</p>	<p>Materials exist for the Level 1, 2 and 3 Learnerships / skills development programmes in up to 5 African languages.</p> <p>Materials applied to and used in at least 20 different environmental practice training contexts.</p> <p>Materials used by at least 5 FET Colleges wanting to offer Environmental Practices Level 1, 2, 3 and 4 skills programmes and/or qualifications. 20 providers using the materials in offering skills</p>
		<p>Colleges. Translate materials into African languages. Make materials (in modules) available to all training providers with capacity to offer EPWP skills training, learnership and/or FET level training for local government entry occupations, and for green jobs development at entry occupation level (e.g. recycling SMMEs).</p>	<p>Environmental Practices Level 1, 2, 3 and 4 Learnerships at local government level, and in support of entry occupation level Green Jobs Development.</p>
<p>Objective 1, Action 4: WORKPLACE SKILLS PLANNING INTERVENTION: Ensure training funds allocation for training of environmental economists</p>	<p>1.6 Support the training of environmental economists</p>	<p>Identify institutions that offer environmental economics at honours and masters levels, and support targeted bursary allocations for environmental economics honours and masters graduates</p>	<p>More environmental economists trained (40 environmental economists by 2014)</p>

Strategic Objective 2: Strengthen and retain leadership skills in the environmental sector

This strategic objective addresses the finding in the ESSP that there is a need to develop, strengthen and stabilise the supply of leadership and management skills in the environmental sector. High vacancy and turnover rates exist amongst leadership and management categories – particularly amongst senior management and at highly skilled professional and management levels in the public sector. This has a knock on effect across the entire system. The problem is particularly acute at provincial level, but has also been identified at local government level and at national government level. The strength of public sector leadership is critical to the capacity of the sector to provide leadership, as envisaged by NEMA and the Strategic Plan for the Environmental Sector. Using a five year trend analysis, the ESSP showed that vacancies of between 25-30% exist in the following categories of employment:

- Highly skilled production workers (level 6-8)
- Highly skilled supervision (level 9-12)
- Senior Management (level 13-16)

While this issue was identified specifically within the environmental sector, it should be noted here that leadership capacity has been identified as a wider national problem. The Department of Labour National Critical Scarce Skills list identifies Managers, Senior Managers and Specialist Managers as being scarce in South Africa. Economic Services Cluster HR Oversight data showed that in most categories of employment in the Economic Services Cluster (where most environmental positions are monitored), vacancy rates have decreased over the past five years, with the Senior Management category being an exception, which rose steadily to 34% by the 2007/8 reporting period. Simple regression forecasting predicted a possible rise in vacancies to 38% by 2011. High senior management vacancies, combined with high turnover rates which show a current 25% rate places strain on the public sector to provide a) **adequate leadership** and b) **continuity of leadership**. Turnover rates have decreased over the past five year period, but remain high at 25%.

This pattern is visible in DEA national (high vacancies and turnover rates in management categories) and in provinces there are particularly high levels of turnover rates amongst senior managers. This pattern is explained by the drive for transformation, but is also explained by the high demand for senior managers across the national system. The prevalence of this across all levels of government in the public environmental sector indicates that it is a **systemic issue** that requires attention in a HCDS, particularly given the new demands being placed on the sector with the emergence of a Green Economy, and new socio-ecological challenges and management approaches necessary (e.g. climate change risks).

The ESSP, using a recent five year vacancy period (2003-2008/9) reports that at provincial level in the public environmental sector, the Free State province had high turnover of senior management staff, and KZN had high levels of vacancies (28%) at senior management level, and turnover of senior management which showed an increase of 4% over the five year period. Vacancy rates in the senior management category remained stable at a high 25% in Limpopo province over the five year period, and Mpumalanga province managed to decrease all its vacancies substantially, but remains with high vacancies in the senior management category, and amongst highly skilled professionals. In the Northern Cape province vacancies increased in all employment categories over the five year period, and highly skilled supervision vacancies have rose from 25% to 35% over a five year period, while senior management vacancies increased from 25% to 35% in the five year period, indicating high levels of leadership vacancies in the department. The North West Province similarly showed high levels of vacancies amongst highly skilled professionals (36%). Senior management vacancy rates decreased by 50%, which is encouraging. The Western Cape public environmental sector also showed increases in vacancies over the five year period at highly skilled supervision level (9% increase). Turnover rates at senior management level increased by 13% in the five year period. Gauteng province showed vacancy rates of 63% in highly skilled positions, and 32% vacancies in the supervision category, with a 24% increase in senior management vacancy rates over the

same five year period, as well as other categories such as skilled supervision (11%). There was also an increase in turnover rates in these categories over the five year period (12% increase in skilled supervision categories and 13% increase in vacancy rates in senior management categories over the five year period). **This indicates the systemic nature of the issue.**

While this is discussed in the context of the public environmental sector above, a similar issue was raised by other groups in the environmental sector. The Not for Profit (NPO) sector (NGOs in particular) are struggling to find appropriate senior management and leadership skills, and in 2009 the LGSETA listed 250 Local Authority Managers on their scarce skills list, noting **high vacancy rates as a critical causal concern** leading to the lack of available skills. The systemic nature of this issue, requires a **national drive to increase environmental leadership skills in South Africa**, and to retain leadership skills at particularly senior management level, where turnover is high.

Objective 1, Action 1: Prioritise the reduction of vacancies at senior management level in the environmental sector, and develop retention strategies to reduce turnover rates.

This action addresses the need to prioritise reduction of vacancies and high levels of turnover at senior management levels in the environmental sector. Retention strategies are needed to reduce turnover rates, and effective strategies for enabling and ensuring continuity and stability of leadership are needed to address the pattern of high turnover and lack of stability in senior management and highly skilled supervision level positions.

At the highest level, this needs discussion with senior managers themselves, and also needs to be discussed at ministerial level. Three immediate actions should be launched:

- Ensure that Senior Environmental Management skills are included on the Department of Labour Scarce Skills List, particularly with climate change

and sustainable development response skills.

- Implement a 'retention drive' for senior managers and highly skilled supervision level positions within the sector. Stronger retention strategies to keep environmental leaders *within* the sector is necessary. This should be linked to improved career pathing, mentoring and coaching.
- Implement a strategy to facilitate and maximise the concept of 'shared leadership' as leaders move from one sector or sub-sector to another, through for example the establishment of an Environmental Sector Leadership Forum. A trend within the environmental sector seems to be that senior managers tend to move both within the sector, and out of the sector. An Environmental Sector Leadership Forum could provide a mechanism for sharing leadership knowledge and skills *within* the sector as a whole, and may help to keep leadership skills circulating within the sector.

HCD research into retention issues shows the need for an integrated corporate vision driven strategy for retention, which includes the following procedures:

- Identification of, and communication on how each employee contributes to corporate vision and strategy;
- Developing a climate of trust;
- Improving the skills level of managers who supervise professional staff;
- Providing management training, including effective leadership skills and emphasizing development;
- Investing in maintaining ongoing commitment with appropriate remuneration and beneficiation strategies.
- Development of mentoring, coaching, career pathing and succession planning for leadership positions that are critical to the corporate vision and strategy.

Objective 2, Action 2: Develop leadership skills for assessing and responding to climate change (risk and opportunity)

This action responds the need to strengthen leadership skills for responding to

critical and complex issues such as climate change. Public sector, and private sector stakeholders expressed a lack of leadership capacity for knowing how to respond to the complex challenges of climate change - from both a risk and an opportunity perspective. This action suggests the development of a high quality training intervention for senior managers in the public and private sector to conceptualise the risk and opportunities associated with climate change and the relevance of these for management and leadership. Both the private and public sector also indicated inadequate technical skills to back up or inform leadership and management decisions, especially for climate change risk assessment and monitoring.

Objective 2, Action 3: Strengthen Sustainable Development Planning leadership skills for improved vertical governance

This action responds to the finding that there is inadequate sustainable development planning leadership skills for improved vertical and horizontal governance. There are, however, some emerging case studies that can be used as examples of best practice (e.g. the establishment of air quality forums in the Air Quality Management sub-sector). These examples of best practice need to be analysed to see how they are set up, how sustainable development planning is being mobilised at different levels of governance (both horizontal and vertical), and what the impacts of this are in terms of service delivery. These best practice examples should then be used to provide training for national, provincial and local government leaders on sustainable development leadership and planning (focussing on vertical and horizontal forms of sustainable development planning and leadership).

Table 3: Implementation actions for Strategic Objective 2: Strengthen and retain leadership skills in the environmental sector

Implementation Actions for Strategic Objective 2	Activity	Processes	Indicator
Objective 2, Action 1: HRD MANAGEMENT SYSTEM INTERVENTION: Prioritise the reduction of vacancies at senior management level in the environmental sector, and develop retention strategies to reduce turnover rates	2.1 Fast track the reduction of vacancies at senior management level in the environmental sector.	Include environmental sector managers on the Department of Labour scarce skills lists	More stability in environmental sector leadership (22% average vacancy rate to correlate more closely with average vacancy rates in Economic Services cluster) by 2014.
	2.2 Implement integrated approaches to retention of leaders in the environmental sector including a mentoring and coaching programme.	Develop institution level leadership attraction and retention measures and report on these at senior management meetings.	
	2.3 Include reporting on Environmental Sector Leadership in appropriate Senior Management Meetings.	Develop and support implementation of a leadership mentoring and coaching programme for national and provincial level leadership development.	

		<p>Monitor and report on leadership vacancies, attraction and retention annually at provincial and national levels.</p> <p>Establish an Environmental Sector Leadership Forum to facilitate discussion of leadership issues within the sector, and to share leadership knowledge and skills within the sector.</p> <p>Develop a Young Leaders Forum Structure for the Environmental Sector where younger leaders may interact with and learn from more experienced leaders.</p>	
<p>Objective 2, Action 2: TRAINING INTERVENTION: Develop leadership skills for assessing and responding to climate change (risk and opportunity)</p>	<p>2.4 Support the development of a climate change leadership training programme / seminar series for government and business leaders, integrated into MBA training.</p> <p>2.5 Support M.Sc bursaries for climate change risk and opportunity assessments.</p>	<p>Establish a partnership with selected South African Business Schools to provide high level leadership training on climate change (risk and opportunity assessment) in short course format, and integrate this into MBA teaching programmes (for longer term sustainability)</p> <p>Partner with the DST Global Change Grand Challenge and selected Higher Education Institutions to provide bursaries for climate change risk and opportunity skills training at Masters and PhD level, with associated work placements.</p>	<p>Integration of climate change leadership training into existing MBAs</p> <p>250 Government and Business leaders complete climate change leadership training programme by 2014</p> <p>25 MSc bursaries allocated with work placements focussing on climate change risk and opportunity assessment by 2014</p>

<p>Objective 2, Action 3: TRAINING INTERVENTION: Strengthen Sustainable Development Planning leadership skills for improved vertical governance</p>	<p>2.7 Develop case studies of best practice sustainable development planning, with emphasis on vertical governance for use in training programme</p> <p>2.8 Develop a training programme for national, provincial and local government leaders on sustainable development leadership and planning [Focus should be on vertical governance, and training programmes should include 'mix' of national, provincial and local government leaders]</p>	<p>Commission service provider to document the case studies for use in training programmes</p> <p>Form a partnership with Higher Education Institutions or other service providers with a reputation for high quality leadership training and with expertise in sustainable development leadership and planning to develop and offer the training.</p>	<p>At least 8 examples of best practice of sustainable development planning implementation within vertical governance and service delivery systems exist and are used in training</p> <p>250 National, Provincial and Local Government Leaders Trained in strategies to provide sustainable development planning leadership for service delivery by 2014</p>
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Strategic Objective 3: Address the Scarce and Critical Skills that currently exist in the environmental sector to enhance vertical and horizontal governance

The ESSP (DEA, 2010) identified vacancies of over 22% in certain categories of skills in the public environmental sector (national and provincial levels). These vacancy rates are considered over a five year reporting period and therefore provide a **proxy indicator** for skills shortages in the national and provincial public sector. These data exclude similar shortages in the local government and parastatal sector and in business and industry, which may provide further increase the actual numbers of skills required in these categories.

- **600 environment related scientists** (if 22% vacancy rate is the 'norm')
- **700 environment related technical staff** (if 22% vacancy rate is the 'norm')
- **150 geologists, geophysicists and hydrologists** (if 22% vacancy rate is the 'norm')

Similar shortages exist at local government level, and best available information from 2009 LGW SETA skills planning data shows the following skills shortages (listed under the category of **absolute scarcity**) in the local government context:

- **100 environmental managers,**
- **600 environmental engineers** (particularly for water, waste and sanitation management),
- **350 environmental health technical staff** and
- **350 Earth and Atmospheric Technicians** (for water and air quality monitoring)
- **300 Civil Engineering Technicians** (for water and waste management)
- **500 Urban and Regional Planners** (with urban, transport planning skills)
- **50 Town Planning Technicians** (with GIS skills)
- **200 Water Plant Operators** (due to new legislation)
- **500 Entry Occupation Recycling or Rubbish Collectors** with waste sorting or recycling skills (due to high vacancies)

Significant for sustainable development and service delivery is the lack of specialist technical skills in key areas of waste management, water and sanitation, and sustainable development planning skills. This data shows that the local government sector is **severely understaffed with environment related skills**, and a **national initiative is urgently needed to strengthen environmental skills in the local government sector**. This needs to be implemented in partnership with the COGTA, and should be aligned with and based on the skills and competency profiles that have been developed within the COGTA National Skills Audit Framework. Of the 91 occupations listed in the Local Government Competence Framework, 14 are environmental occupations (15% of local government employment categories are directly related to environmental service delivery functions).

There are also scarce skills that are related to new trends in the environmental sector, particularly:

- Environmental economists
- Climate Change scientists, risk assessors and long range modellers
- Sustainable Development Planners

In each environmental sub-focus area there are also specific scarce skills that have been identified, outlined in Table 4 below. These need to be regularly assessed for internal levels of scarcity in different institutional contexts (national, provincial and local government) and the list should form the basis of initial decision making related to allocation of bursaries from skills development funding.

Table 4: Summary of scarce skills identified at sub-focus level (exact quantities should be assessed at institutional level through ongoing monitoring and analysis) (from the Environmental Sector Skills Plan, DEA, 2010)

SKILLS LEVEL	WASTE MANAGEMENT	AIR QUALITY MANAGEMENT	GENERAL ENVIRONMENTAL MANAGEMENT (INCLUDING SD AND CLIMATE CHANGE)	ENVIRONMENTAL IMPACT MANAGEMENT AND POLLUTION CONTROL	MARINE AND COASTAL MANAGEMENT	BIODIVERSITY
High Skills (Management)	Senior Managers Middle Managers in public sector	Senior Managers Middle Managers in public sector	Senior Managers Middle Managers in public sector	Senior Managers Middle Managers in public sector	Senior Managers Middle Managers in public sector	Senior Managers Middle Managers in public sector
High Skills (Specialist Professionals)	Waste Researchers and Scientists Toxicologists Soil Geochemists Remediation Specialists Landfill Designers	Air pollution control officers Air Quality Specialists Engineers Atmospheric Dispersion	Environmental managers (at local government level) Long range modellers Climate change risk assessors	Environmental Impact Management Officers (56% shortage at provincial level) Environmental	Environmental Management Inspectors & Compliance Officers Researchers Climate Change	Bioregional Planners Taxonomists Soil Scientists Scientific Curators Physical Curators Climate Change specialists

	and Managers	Monitoring Atmospheric Scientists	Nanotechnologists Space Scientists Climatologists Environmental Engineers Astronomers	Management Inspectors Environmental Risk Assessors Hydrologists Entomologists Cleaner Production Skills	Specialists Oceanographic Engineers Aquaculture Skills Coastal Zone Sustainable Development Planning	Bio-systematics Stewardship and Extension (Relative Scarcity) Environmental Compliance Officers (EMI) Bioprospecting Biosafety
Intermediate Skills	Environmental Science Technicians (with specialist competence for waste management)	Air Quality Compliance Monitoring Technicians Licensing Officers	Environmental Science Technicians	Environmental Science Technicians Cleaner Production Technicians	Fisheries Control Officers Oceanographic Technicians Community based Monitoring Skills (for coastal zone) Monitoring skills (for monitoring fish stocks)	Extension and social ecology skills Databases Herbaria technical staff
Entry Occupation Skills	Waste recyclers (relative scarcity, related to formalisation of recycling industry and new waste management act)				Community based Natural Resource Management Skills	Community based Natural Resource Management Skills

Critical when considering these lists, is the need to increase the number of black women scientists and managers in the environmental sector, and they should therefore be given first preference in terms of available bursaries, internships and work placements. The ESSP also identified the need to encourage young black men to participate in environmental careers as a decline in the participation of young black men was observed in key study

fields related to the environment. This should not, however, be done at the expense of encouraging black women participation as black women are still proportionately most poorly represented in the environmental sector.

Objective 3, Action 1: Improve the supply, mentoring and retention of internal scarce scientific and other skills in the public environmental sector

Targeted bursary and internship schemes, linked to and funded by workplace skills plans and annual training budgets at national and provincial levels should be used to address the scarce skills in the environmental sector (Table 4).

There is also a need to establish additional bursary funds for environmental technician training and a strategy for targeted placements of environmental technician trainees with Universities of Technology to boost numbers of graduates in these areas.

Develop a ‘bursaries allocation priority list’ within DEA and share this with all provinces and with environment sector Human Resource Departments. Establish a ‘bursary management system’ to ensure that bursary holders are adequately supported to progress through the HEI system, and into work

placements – for environmental scientists and technicians. Honours level and Masters level bursaries should be supported as the ESSP reported a high drop off of potential graduates at first degree level, and again at Honours degree level. The possibility also exists to form a partnership with the DST who are investing in scholarship funding for post-graduate studies and support of a multi-site Masters Degree Innovation Programme/s in Earth System Sciences and Sustainability Innovations. The DST scholarship applicants could be offered internships and work placements straight after graduations in the public, thus streaming these graduates into the public sector where possible.

Objective 3, Action 2: Initiate and support the development of training programmes that address critical skills and environmental mandates using a co-ordinated, workplace learning approach

The Strategic Plan for the Environmental Sector identifies the following skills development priorities to strengthen skills for implementation of environmental mandates over the next five years:

Table 5: Skills development needs for implementing the Strategic Plan for the Environmental Sector (based on analysis of skills needs outlined in the Strategic Plan for the Environmental Sector, DEA, 2009)

Sub Focus	Main Skills Development Initiatives Needed	Main Target Groups (occupational categories)
Waste Management	Local and provincial government capacity for avoidance approaches and implementation of the NWA, including development of Integrated Waste Management Plans Public awareness and empowerment to participate in avoidance approaches Green Jobs skills initiative for formalising recycling activities (development of SMMEs)	Local Government Managers Environmental Officers in LG General Public Intermediate and entry occupations (waste recyclers)

Air Quality Management	<p>Local and provincial government capacity for atmospheric emission avoidance, licencing, compliance monitoring and enforcement, and for developing and reviewing Air Quality Management Plans.</p> <p>Improvement of tertiary level training</p> <p>Preparation of targets, timelines, guidelines and manuals (to be used in training programmes)</p> <p>Community education and empowerment (with clean energy technologies) to reduce poor indoor and ambient air quality in dense, low-income settlements</p> <p>Technical skills training and capacity for avoidance and reduction of emissions from industrial sources, landfills, incinerators, household chemicals and fossil fuels (transport).</p> <p>Capacity building for taking on licencing responsibilities as envisaged in the AQA.</p>	<p>23 District Municipalities identified as having poor or potentially poor air quality</p> <p>Environmental Management Officers in LG</p> <p>General public in low income settlements</p> <p>Industry and LG environmental managers, scientists and technicians</p> <p>Air Quality Control Officers</p>
Pollution Incident Management	<p>General training programmes on pollution incident management, risk reduction &</p> <p>Provision of emergency services</p> <p>Coastal Zone Incident Management Training</p>	<p>Provincial and Local Government EM officers</p> <p>Disaster and risk reduction units</p>
Environmental Impact Management Training	<p>Improved scientific, decision making and report writing skills & quality improvement</p> <p>Training in wider range of EIM tools</p> <p>Compliance monitoring skills training</p> <p>Regulations and application of EIM administrative systems</p> <p>Public participation and understanding of EIM processes and regulations</p>	<p>Environmental Impact Assessors</p> <p>Regulators, EIM practitioners, Compliance officers, LG EM officers</p> <p>Provincial administrators</p> <p>General public, Interested and Affected parties</p>

Conservation and Sustainable	Management and research skills in various areas	Managers Scientists
Use of Biodiversity	General training in new approaches to biodiversity management (e.g. bioregional planning, adaptive management, ecosystem services approaches etc.) Spatial biodiversity planning and management Compliance monitoring skills Stewardship approaches General public education	Managers, Scientists, LG and provincial biodiversity officers Provincial and LG environmental officers Compliance officers Land users (e.g. farmers; developers etc.) General public
Marine and Coastal Management	Research capacity for monitoring fish stocks and assessing marine ecosystems Modelling skills Skills for using new approaches (e.g. ecosystem services approaches) Compliance Monitoring Training Community-based monitoring skills Integrated Coastal zone management planning	Researchers, Scientists Researchers National, provincial and local government Fisheries Officers General public, EPWP Provincial and local government environmental officers
Compliance and Enforcement	Compliance officer training (EMI) Improved & pro-active compliance monitoring and capacity for using joint enforcement programmes Capacity building for voluntary compliance	Compliance officers Compliance officers, provincial and local government Industry and public

While these priorities for training have been identified, many of the initiatives proposed are **targeting the same audiences** most notably provincial and local government officials. The ESSP showed that learnerships and integrated, more substantive skills programmes, while being a potentially powerful workplace learning instrument, have been severely under utilised in the environmental sector for building workplace learning capabilities. The tendency has been to rely on short courses. The new Qualifications Council for Trade and Occupations, and NSDS III recommends an **occupationally focussed** approach to skills development, and more substantive skills development interventions (not just short courses).

This is particularly significant for the environmental sector, and particularly for local government officers responsible for environmental management at local government level, as they are constantly faced with new policies, new environmental challenges, and new demands for improving their practice. It is therefore suggested that the DEA Co-ordinate its national branch efforts to strengthen local government environmental officer capacity through a **co-ordinated learnership / integrated skills development programme focussing on 'Environmental Policy and Practice: Implementation and Service Delivery'**. Such a learnership / integrated skills development programme should be **occupationally focussed** and can be developed at different levels (e.g. level 5, 6, or 7) in partnership with the COGTA who have recently developed new competency profiles for local government employees according to standardised occupational categories, and should target at least the following employment categories in the COGTA framework:

- Urban and Regional Planners (emphasis on sustainable development policy and practice)
- Environmental Management Officers (emphasis on environmental management and sustainable development policy and practice)
- Conservation Officer (emphasis on conservation policy and practice)
- Environmental Health Officer (emphasis on waste and other environmental health policy and practice)
- Earth and Atmospheric Science Technicians (emphasis on air, water, and other environmental policy standards, and relevant monitoring practices)

Such a learnership / integrated skills programme, if carefully designed with core and elective components, can service the entire environmental sector within a coherent framework focussing on environmental policy and practice (although there may be variations of specialisms with regards to specific policies and occupational practices). The learnership / integrated skills programme should be developed in such a way that it addresses DEA policy priorities and service delivery priorities for communities in local contexts, and the KPA / **occupational skills demands for environmental management officers and decision makers** in local government contexts. The guidelines and materials being developed by the various DEA branches can provide useful course materials and implementation practices support within this learnership programme.

Objective 3, Action 3: Align critical skills development needs with Key Performance Areas and Performance Management Systems and align critical skills demands with workplace skills planning systems

The ESSP research revealed that there is a wide variety of identified critical skills, and a high level of use of short courses as mechanism for addressing critical skills. Critical skills are both generic in nature (e.g. skills for using ICTs, or for financial management) and mandate specific (e.g. environmental impact assessment skills, or community based natural resource management skills). The ESSP indicated that there is a dual funding system providing training funds to address these critical skills gaps in the public sector. The PSETA allocated training funds through Human Resource Departments are funding the generic critical skills development programmes, and line function budgets are being used to fund mandate specific skills development needs.

There is, however, a perceived lack of relevance associated with many of the training programmes, poor alignment with real workplace needs, and under-accreditation (courses are accredited at levels lower than what the particular employees require in comparison with their other qualifications). For example, a level 7 qualified highly skilled manager will be sent on a level 3 or 4 financial management course. The training offered seems to be primarily provider

driven, and courses that are on offer are those that are generic enough to service a wide range of employees in the public sector (economies of scale). Large amounts of funding are being spent on these training programmes (an average of R15 000 per beneficiary), which in turn denotes inefficiency in expenditure in relation to outcome of investment.

There is poor alignment between critical skills identification, training provided, and KPAs. A process an instrument needs to be developed to address this disjuncture, as it affects the quality of workplace skills planning, the funding that is allocated to training, the efficacy of training, and ultimately the employees capacity to deliver on the sector mandate i.e. it affects performance and service delivery.

This issue is linked to communication between line functions and HR Departments. A shift needs to take place from provider driven to sector needs driven training provisioning. Improved workplace skills planning and monitoring of training expenditure in terms of efficacy and relevance to the KPAs of the individual receiving training, and performance of the organisation in terms of delivery needs to be supported.

Table 6 defines a list of generally identified critical skills across sub-sectors of the environmental sector. There is a need to address the following critical skills gaps in key occupations where these skills are needed for enhancing performance.

Table 6: Critical skills gaps identified across the environmental sector (ESSP, DEA 2010)

Skills level	Identified common critical skills gaps (across environmental sub-sectors)
High skills (Senior Management)	<ul style="list-style-type: none"> • Leadership skills • Risk assessment and risk management • Environmental law and policy skills • Organisational development • Integrative skills (e.g. policy and science)
High Skills (Middle Management)	<ul style="list-style-type: none"> • Human Resources Management Skills (including mentoring and coaching skills) • Environmental law and policy • ICT skills, including use and interpretation of GIS and modelling technologies • Project Management skills • Research skills • Report writing skills
High Skills (Technical Professional)	<ul style="list-style-type: none"> • Environmental law and policy • Integrative skills • ICT skills, including use and interpretation of GIS and modelling technologies • Integrative skills (e.g. ICT and science; science and policy etc.) • Monitoring, modelling and evaluation skills • Report writing skills

Priority programmes to address critical skills that need to be developed to service the sector include:

- Environmental law and policy
- Integrative skills programmes
- Mentoring and coaching
- ICT skills programmes, including use and interpretation of GIS and modelling technologies
- Green procurement and green economy planning skills

- Environmental ethics and social justice practices in the environmental sector

There are also a number of cross cutting responsibilities (i.e. relevant to a number of departments), with new critical skills development demands outlined below in Table 7. These will also need to be aligned with Key Performance Areas, before integrating them into workplace skills planning.

Table 7: New skills development demands for new cross cutting responsibilities (ESSP, DEA 2010)

Cross-cutting responsibilities	Key strategies recommended	Skills Development Demands
Green Economy	Alternative energy development Implement cleaner production Institute the 'polluter pays' principle Implement post-compliance incentive schemes Waste reduction through diversion of resources Make use of ecological economics that incorporates full cost-benefit and life-cycle analyses Protect ecosystem services from further degradation using full cost accounting strategies Mobilise and strengthen indigenous and local knowledge	Cleaner production and low carbon energy technology development skills Environmental Economics Skills Life Cycle Analysis and valuation skills Ecosystem services assessment and monitoring skills
Climate Change Mitigation	Energy efficiency and emissions reduction Low-carbon technology development Sustainable production and consumption Waste minimisation Cleaner production and pollution control Institute the Polluter Pays principle and post-compliance incentives Integrated environmental planning with a focus on low carbon development and reduction of carbon footprint Restoration of degraded biomes Greening, using indigenous plants and food sources Planting appropriate indigenous plant species for carbon sequestration Sustainable land-use management	Cleaner production and low carbon energy technology development skills Waste minimisation skills Integrated Environmental Management Skills Restoration, Greening and Planting Skills for carbon sequestration Sustainable land-use management skills

<p>Climate Change Adaptation</p>	<p>Sustainable building codes and low energy installations Improve water storage and capture, and maintain the ecological reserve Avoid low lying coastal areas for development in EIM Promote sustainable agriculture Implement effective EIM that addresses climate change impacts Extend protected areas Planting of carbon absorbing plants across all biomes using CDM and Carbon Trading Funds Provide Community-based Adaptation support Implement climate change adaptation education, communication and public engagement programmes</p>	<p>Green building, green procurement, green design and low carbon energy technology skills. Integrated environmental management skills Economic and Ecological skills to access and use the Carbon Market Community-based Adaptation Skills Climate Change Education, Communication and Public Engagement Skills</p>
<p>Sustainable Development</p>	<p>Integrate SD principles into planning and infrastructure development at all levels Implement SD principles in the NFSD Employ the precautionary principle Incentivise energy efficiency and sustainable energy generation Sustainable waste services and transformation of wastes into productive inputs – move towards a dematerialised economy Improve the co-ordination of urban development strategies Protect natural resource based ecosystem services, also in the context of rural livelihoods Integrate biodiversity considerations into land-use planning Manage natural resources with sustainable development and use principles Develop capacity at all levels of government to plan for, implement and enforce sustainable development responsibilities Ensure funding for sustainable development at local levels Prioritise and facilitate development of sufficient government capacity to ensure effective implementation of policies, laws and programmes of the environmental component. Develop capacity for multi-stakeholder participation in decision making</p>	<p>Sustainable Development Planning Skills Low carbon / renewable energy development skills Zero waste management skills Sustainable Urban Development skills Ecosystem services management skills (CBNRM) Environmental education and training skills (to service capacity building needs) Public participation skills</p>

The exact environmental / sustainable development skills demands will need to be accurately quantified in different government departments and institutions through **Workplace Skills Planning Processes that are aligned with key performance areas and operational mandates**. Currently environmental skills are neglected in workplace skills planning processes.

Findings from the HCDS research shows that workplace skills planning in the environmental sector is by and large compliance driven, and is not optimised as an important internal instrument for improving skills in the sector. Better workplace skills planning instruments need to be developed that can facilitate

a demand led approach to workplace skills planning. This will need to be done with human resource directors and managers, *with* an appropriate training programme for these occupations, as capacity for such an approach to workplace skills planning needs to be developed within the environmental sector. Data in the ESSP also showed that there is a very high level of turbulence (i.e. turnover) in the HRD directorates in the environmental sector. Clear guidelines therefore need to be established and embedded into HRD practice, to avoid loss of capital and knowledge within a changing turbulent employment and internal skills planning environment.

Table 8: Implementation actions for Strategic Objective 3: Address scarce and critical skills in the environmental sector

Action	Activity	Process	Indicator
<u>Objective 3, Action 1:</u> TRAINING AND HRD SYSTEM INTERVENTION: Improve the supply, mentoring and retention of internal scientific skills in the public environmental sector	3.1 Develop a quantified 'bursaries allocation priority list' within DEA and share this with all provinces and with environment sector Human Resource Departments.	Use the scarce skills list (Table 4) to develop a quantified 'bursaries allocation priority list'. Share this with the HR Departments for allocation of skills funding towards bursaries. Develop a monitoring system to assess progress with bursary allocations, graduations and work placements (internships). Assess whether allocation of 25% of skills levies is adequate for funding necessary bursaries or if alternative funding needs to be sought for bursaries. Form a partnership with the DST / NRF Global Change Grand Challenge National Research Programme to fund bursaries and to place graduates funded by NRF Global Change National Grand Challenge Scholarships.	Bursary list exists and informs allocation of bursaries in priority areas
	3.2 Establish a 'bursary management system' to ensure that bursary holders are adequately supported to access work placements.		Bursary allocations monitored regularly
	3.3 Form partnerships to allocate resources for bursaries.		Supportive infrastructure – particularly for work placements exists for bursary holders
	3.4 Use scarce skills list to develop a targeted university level career guidance programme to attract young students into the environmental sector. Link this to bursary allocations and work placements programme.		Funds allocated to bursaries
			Targetted university career guidance programme for 2nd and 3rd year students.
			Work placement programme for scholars receiving bursaries

<p><u>Objective 3, Action 2:</u> TRAINING INTERVENTIONS Initiate and support the development of training programmes that address critical skills and environmental mandates using a co-ordinated, workplace learning approach</p>	<p>3.5 Support the initiation and development of priority training programmes that address critical skills needs across the environmental sector (Table 6), in environmental sub-focus areas (Table 5 above), and for new cross cutting skills demand areas (Table 7).</p> <p>3.6 Develop a co-ordinated approach to Provincial and Local Government training that is occupationally directed and that reduces duplication and over-targeting of the same recipients.</p>	<p>Develop guidelines for a co-ordinated workplace learning approach to environmental training programmes.</p> <p>Work with the SETA structures to ensure funding is allocated for training programmes that are needed to address critical skills gaps, specific priorities and new cross cutting skills demand areas.</p> <p>Develop a learnership / integrated skills programme focussing on 'Environmental Policy and Practice' at provincial and local government level that integrates a variety of DEA priorities for training.</p>	<p>Guidelines for training providers and SETAs.</p> <p>Funding allocated from skills development system for skills training in critical skills.</p> <p>Co-ordinated training programme completed for 200 local and provincial government officials by 2014 that integrates a variety of DEA priorities into occupational framework of national and local government environmental officers.</p>
<p><u>Objective 3, Action 3:</u> HRD AND MANAGEMENT SYSTEM INTERVENTION: Align critical skills development needs with Key Performance Areas and Performance Management Systems and align critical skills demands with workplace skills planning systems.</p>	<p>3.7 Establish and support an HRD Network that develops tools and instruments for aligning critical skills development needs with KPAs and Performance Management systems.</p> <p>3.8 Support HRD Managers to improve workplace skills planning so that these include environmental sector critical skills needs (identified in Tables 5, 6 and 7), as well as scarce skills needs (identified in Table 4).</p> <p>3.9 Develop a web-based instrument for communicating and monitoring relevant training programmes to HRD with recommendations on critical skills requirements in relation to KPAs and different occupational categories</p>	<p>Organise regular meetings with HRD Managers to improve skills planning and provisioning.</p> <p>Develop guidelines for HRD practices that align critical skills with Key Performance areas and performance management systems.</p> <p>Develop guidelines for improved workplace skills planning.</p> <p>Establish a website that contains information on:</p> <ul style="list-style-type: none"> • Environmental courses available for addressing critical skills gaps (using quality criteria to describe courses) • A 'star rating' evaluation system to be completed by all officials attending the courses (to enable ongoing quality monitoring of training programmes) based on quality criteria 	<p>Training for critical skills is aligned with mandate, key performance areas and performance management systems.</p> <p>Workplace skills plans reflect training programme provisioning for critical skills gaps that address the environmental mandate (not only generic workplace skills).</p> <p>Nationally accessible quality monitoring and communication system for courses on website that communicates information on various courses available, that facilitates access to these courses and that allows for an ongoing open system of participatory monitoring of courses exists. System is used by HRD Managers, line managers and professionals to access and evaluate training programmes.</p>

Strategic Objective 4. Strengthen the human capital development pipeline for the environmental sector

This objective addresses the need for a sustainable, systems-based approach to human capacity development within the environmental sector. As indicated above, various strategies have been suggested to address critical and scarce skill needs, and to ensure a pro-active approach to skills development in the environmental sector that addresses the various dynamics of skills development i.e. new skills needed in the sector, leadership skills, adequate skills for providing environmental skills, scarce and critical skills, and workplace skills planning and skills planning alignment with critical skills. Besides these, there is a need to give attention to other aspects of the human capital development pipeline, particularly career guidance, teacher education and the general improvement of the quality of environmental education and training.

Objective 4, Action 1: Expand knowledge of environmental careers in schools and universities

The ESSP research showed that there is very poor quality career guidance currently available to the scholars in schools and universities who may wish to enter the environmental sector. Environment is not promoted as a career of choice in school-based career guidance, and teachers lack knowledge of environmental careers. Career guidance in schools is generally poorly executed, if not entirely neglected. Other strategies (not only relying on teachers) therefore need to be used to provide career guidance to learners in schools to understand potential environmental careers. Integrating environmental career guidance into targeted environmental education programmes such as Eco-Schools could potentially provide better outcomes than simply targeting broad-based career guidance opportunities. Focused career guidance dimensions integrated into key environmental days could be another strategy (for example, promote careers in sustainable forest management or soil sciences during Arbor Week Celebrations; or promote

careers in oceanographic technical occupations during Marine Week etc.). Such approaches are likely to have more effect than broad approaches.

However, for university-based career guidance, much more focussed, targeted approaches to environmental career guidance are needed. Here working with university career guidance centres to provide them with materials and approaches to support students (2nd and 3rd year students in particular) to make choices that will enable access to a variety of environmental careers is necessary. A national initiative working with university career guidance centres is necessary to a) understand the type of career guidance that students seek at this stage and b) to develop customised career guidance options for various universities and their programmatic offerings. This should be combined with a clearly defined and easy to access bursary programme for environmental sciences and technical career opportunities, which university career centres and administration offices can share with students to facilitate entry to the environmental sector. The ESSP research showed that large numbers of potential scholars are lost to the system between first degree and honours degree levels, and between honours and masters degree levels. This group of scholars (particularly in sciences and in environment related degree areas e.g. environmental engineering / technology) should be specifically targeted with such a focussed environmental career guidance initiative.

Objective 4, Action 2: Ensure adequate attention is given to public awareness and environmental education in teacher education, in interactions with schools, and for youth in rural areas

The ESSP indicated that there are some 350 000 teachers in South Africa's schools. Through integration of an environmental focus in the National Curriculum Policy, all teachers have a mandate to teach environmental education in the context of the different Learning Areas. Numerous research programmes show, however, that teachers have poor content knowledge of environmental issues, since environment is a new focus in the national curriculum in South Africa and elsewhere. Teachers also need capacity to

translate environmental information into appropriate pedagogical strategies and processes. This requires **pedagogical content knowledge** (e.g. they need to know how to represent climate change issues to grade 3 learners, or grade 10 learners). This requires **teacher education support**, as few of South Africa's teacher education institutions are integrating environmental education into the curriculum with adequate attention to the **pedagogical content knowledge as well as new environmental information**. Supporting the integration of environment into Teacher Education, is critical for developing an environmentally literate citizenry and for strengthening public participation in environment and sustainability practices. Undertaking such a programme will require engagement with the Department of Education, as many new priorities need to be integrated into an already stressed system, and care should be taken to ensure that environmental learning is not seen as an 'add on' but as an integral new dynamic of the new education system in South Africa.

At a wider level, there is a need to integrate environmental education and training into public education programmes, particularly for women and youth groups. The DST, in their Global Change Grand Challenge Human Capital Development Strategy, are considering the development of a learnership for Youth focussing on citizen science and sustainability. The DEA could partner with the DST to develop such a learnership, particularly if it is linked to the 18.2 learnership fund, and if its focus is community participation in environmental practices (i.e. it supports youth to develop the skills necessary to contribute to ongoing environmental citizenship, and to potentially enter the environmental sector). Qualifications and materials developed under Strategic Objective 1 may be used for this purpose. The ESSP research showed that youth were a particularly neglected category in the environmental sector, and there were very few youth environmental learning programmes on offer. Making use of the learnership system to achieve positive outcomes for youth and for enabling potential entry to the environmental sector is possible.

Objective 4, Action 3: Use the DEA National Environmental Learning Forum as a mechanism to enhancing quality of environmental education and training in the South African Education and Training system

Studies conducted on the quality of environmental education and training for the HCDS indicates that in general the quality of environmental education and training in South Africa is uneven. Many programmes offer outdated environmental information, and there is poor quality transfer of environmental content knowledge, and a poor practical transformation of environmental content knowledge. Environmental education materials and programmes also tend to emphasise problems rather than more sustainable alternatives and solutions. Training materials are also poorly designed for workplace learning activities and many training activities lack relevance. There are, however, many examples of good practice that can be used to strengthen the quality of environmental education and training.

Action	Activity	How	Indicator
<p><u>Objective 4, Action 1:</u> EDUCATION SYSTEM INTERVENTION Expand knowledge of environmental careers in schools and universities</p>	<p>4.1 Develop programme to raise general awareness of environmental careers, targeted and integrated with other key environmental events (e.g. Arbor week, Marine week etc.)</p> <p>4.2 Develop specific targeted career guidance programme for universities linked to scarce skills attraction strategy, bursary and work placement programme.</p>	<p>Develop a role model programme to make various environmental career options more visible to learners in schools. Provide nationally relevant career information (form partnership with Indalo Yethu and other national institutions)</p> <p>Work with individual universities – career guidance programme officers- to develop career pathing information for graduates (2nd, 3rd year and honours graduates) and linked to incentive programme to enter the environmental sector (e.g. bursaries, work placement programme etc.).</p>	<p>All major environmental events include a focus on career options in the environment sector, with reliable information on how scholars can work towards an environmental career</p> <p>Website on environmental careers and study pathways exists for scholars to access</p> <p>Information on career paths and access mechanisms (e.g. bursaries etc). shared with schools and FET colleges</p> <p>More 2nd and 3rd year students choosing environmental careers.</p>
<p><u>Objective 4, Action 2:</u> TRAINING PROGRAMME INTERVENTION:</p>	<p>4.3 Form a partnership with national institutions to support a Teacher Development Network and programme to strengthen teachers' environmental knowledge. Align DEA priorities with curriculum policy.</p> <p>4.4 Use Environmental Practices Training Materials to support Youth Citizen Science and Sustainability Learnership for out of work / out of school youth, particularly in rural areas.</p>	<p>Develop framework for teacher education programme to align with continuous professional development strategy of DoE and teacher education policy – to ensure sustainability of the initiative within the Teacher Education system in future.</p> <p>Form partnership with DST / DRD and other national institutions with an interest in environmental citizenship and youth development. Work with SETAs to access SETA funding for the learnership implementation.</p> <p>Integrate career access and green job access pathways for youth participating in the learnership.</p>	<p>Teacher Education Network exists involving all Teacher Education Institutions</p> <p>Environmental Learning materials used by teacher education institutions in teacher training.</p> <p>1000 youth trained in environmental citizenship actions at community level, particularly in rural areas.</p>

<p>Objective 4, Action 3: TRAINING SYSTEM INTERVENTION: Support improvement in the quality of environmental education and training programmes</p>	<p>4.5 Develop sourcebooks / guidelines for the different education and training 'sectors' (GET, FET, HET and OLS) to show examples of good quality environmental education and training programmes, illustrating key elements of good quality environmental education and training at all these levels.</p>	<p>Use the Environmental Learning Forum structure to establish 'quality working groups' that develop source materials, identify examples of best practice, and develop guidelines for different educational sectors.</p> <p>Use the research conducted for this HCDS as the foundation for these guideline documents.</p> <p>Support all providers through the ELF to improve the quality of the environmental education and training on offer through regular forum meetings where issues of quality are discussed and reviewed.</p>	<p>Improvement in quality of at least 100 different environmental education and training programmes by 2014.</p>
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4. Proposed implementation framework

The table below indicates a phased implementation process for the various activities associated with the Actions outlined in the HCDS. It indicates that 2010 activities are primarily 'start up' activities, that give impetus for further activity development and continuity thereafter. Some activities need to be implemented after others (e.g. Activity 2.5 can only take place once Activity 2.4 is in place). Some activities, once established, can continue year after year. The HCDS has been designed to **catalyse** key interventions that, when established, should gain momentum and / or should continue to function

within normal institutional functions. Here it should be noted that one of the key issues hampering skills development in the environmental sector has been an inability to initiate the right kind of interventions and to locate them systemically within the skills development system. This HCDS therefore aims to address this problem through strategically placed initiatives (e.g. supporting the initiation of leadership training with business schools, which should ideally become self sustaining after the initial investment; or developing guidelines for green economy skills planning which thereafter should be taken up by SETAs and green economy planners).

Strategic Objectives	Actions	2010	2011	2012	2013	2014
1: Support Skills Development for green jobs and a green economy	<p>Action 1: Integrate environmental driver into NSDS III and OLS</p> <p>Action 2: Develop Training of Trainers Programme for Providers of Green Jobs and Green Economy Training</p> <p>Action 3: Develop national materials for Environmental Practices level 1, 2 and 3 Learnership and/or skills programmes</p> <p>Action 4: Support the Training of Environmental Economists</p>	Activity 1.1	Activity 1.2 & 1.3 Activity 1.4 Activity 1.5 Activity 1.6	Activity 1.2 Activity 1.4 Activity 1.5 Activity 1.6	Activity 1.2 Activity 1.4 Activity 1.5 Activity 1.6	Activity 1.2 Activity 1.4 Activity 1.5 Activity 1.6
2. Strengthen and retain leadership skills in the environmental sector	<p>Action 1: Prioritise the reduction of vacancies at senior management level, and develop retention strategies to reduce turnover rates.</p> <p>Action 2: Develop leadership skills for assessing and responding to climate change</p> <p>Action 3: Strengthen sustainable development leadership planning skills for improved vertical governance</p>	Activity 2.1	Activity 2.1, 2.2, 2.3 Activity 2.4 (set up) & 2.5 Activity 2.7 (set up)	Activity 2.1, 2.2, 2.3 Activity 2.4 & 2.5 (Activity 2.7)	Activity 2.1, 2.2, 2.3 Activity 2.4 & 2.5 Activity 2.8	Activity 2.1, 2.2, 2.3 Activity 2.4 & 2.5 Activity 2.8

<p>3. Address Scarce and Critical Skills that currently exist in the environmental sector to enhance vertical and horizontal governance</p>	<p>Action 1: Improve the supply, mentoring and retention of internal scientific and other scarce skills in the public environmental sector</p> <p>Action 2: Initiate and support development of training programmes that address critical skills and environmental mandates using a co-ordinated, workplace learning approach</p> <p>Action 3: Align critical skills development needs with KPAs and Performance Management Systems and align critical skills demands with workplace skills planning processes.</p>	<p>Action 3.1</p> <p>Action 3.5</p> <p>Action 3.7, 3.8</p>	<p>Action 3.1, 3.2, 3.4</p> <p>Action 3.5, 3.6</p> <p>Action 3.7, 3.8</p>	<p>Action 3.3, 3.4</p> <p>Action 3.5, 3.6</p> <p>Action 3.7, 3.8, 2.9</p>	<p>Action 3.3, 3.4</p> <p>Action 3.5, 3.6</p> <p>Action 3.7, 3.8, 2.9</p>	<p>Action 3.3, 3.4</p> <p>Action 3.5, 3.6</p> <p>Action 3.7, 3.8, 2.9</p>
<p>4. Strengthen the human capital development pipeline for the environmental sector</p>	<p>Action 1: Expand knowledge of environmental careers in schools and universities</p> <p>Action 2: Ensure adequate attention is given to public awareness and environmental education in schools, in teacher education and for youth in rural areas</p> <p>Action 3: Use the DEA Environmental Learning Forum as a mechanism to enhance the quality of environmental education and training in the South African Education and Training System.</p>	<p>Activity 4.1</p> <p>Activity 4.3</p> <p>Activity 4.5</p>	<p>Activity 4.2</p> <p>Activity 4.3</p> <p>Activity 4.5</p>	<p>Activity 4.1 & 4.2 (ongoing)</p> <p>Activity 4.4 & 4.3 (ongoing)</p> <p>Activity 4.5 (ongoing)</p>	<p>Activity 4.1 & 4.2 (ongoing)</p> <p>Activity 4.4 & 4.3 (ongoing)</p> <p>Activity 4.5 (ongoing)</p>	<p>Activity 4.1 & 4.2 (ongoing)</p> <p>Activity 4.4 & 4.3 (ongoing)</p> <p>Activity 4.5 (ongoing)</p>

5. Proposed Means of Implementation

The DEA HCDS will require a co-operative approach to implementation within DEA, and with public entities and provincial government departments with a responsibility for implementing national environmental policy. Leadership for communication of the HCDS and for aspects of its initial implementation should be provided by the Chief Directorate: Co-ordination and Information in the DEA, particularly to provide strategic leadership and guidance for all 4 objectives, but most importantly Strategic Objective 2. The HR Chief Directorate should provide strategic leadership for the implementation of Strategic Objective 3, and should ensure that training budgets are allocated towards addressing the identified critical and scarce skills gaps.

Of critical importance will be the leadership provided by DEA to capitalise on available **skills system structures and funding to resource the skills development needs of the environmental sector**. As reported in the ESSP (DEA, 2010), and in this HCDS, the environmental sector has, to date not been able to fully capitalise on the partnerships potential that exists with the education and training sector to ensure effective skills development for the environmental sector. Thus, this HCDS requires a partnerships approach, to leverage skills system resources for strengthening the skills necessary for effective service delivery and governance, as is outlined in the intentions and goals of the SA Human Resources Development Strategy.

There is also need for a co-ordinated structure within DEA to take responsibility for driving this HCDS implementation if longer term sustainable systems of skills provisioning for the environmental sector are to be achieved. This structure will require adequate capacity (financial resources and human capacity), to address the scope of work outlined in this HCDS, and to provide skills development leadership for the environmental sector. Sufficient resources will need to be allocated to the catalytic activities needed to 'fast track' and establish a sustainable systems of environmental skills supply in South Africa. All branches within DEA would also need to co-operate in implementing

Objective 2 and 3, particularly for ensuring internal human capital development needs, and achievement of sub-focus human capital development needs. Efforts should be made to ensure synergy and avoid duplication.

Critical to the success of the HCDS will be partnership formation with the SETAS, as SETAS can allocate funding for training interventions. Start up and more catalytic activities will need to be initiated and co-ordinated by DEA's ETDP directorate. All activities in the HCDS are designed to become self sustaining after initial investments have been made. This will however, require investment in strategic partnerships development.

6. Monitoring and Evaluation of the HCDS

The ESSP noted that there is a need for a national system for monitoring Human Capital Development Needs. This requires engagement with SATS SA to capture environmental occupational categories in the national system of statistics. Development of this national monitoring and evaluation system will greatly enhance sector capacity for monitoring environmental skills from a supply and demand perspective.

For the monitoring and evaluation of this HCDS however, the following strategies are suggested:

1. **Monitoring of results using indicators provided in the strategy:** Indicators have been provided for all activities. In some cases more specific qualifications of the activity results may be needed using an iterative, reflexive approach to monitoring the anticipated results. As the implementation strategy requires continuity over 4 years, it is suggested that results are monitored annually, with summative reporting on results in the final year of implementation.
2. **Monitoring of direct investments:** As this HCDS has been designed to mobilise additional resources from wider systems of resource provisioning (e.g. the national SETA system and workplace skills levy funding), direct DEA budget investments *versus* additional investments need to be monitored to establish the full scope and scale of investment in HCDS. HCDS research for example indicated that provincial departments all spend between ZAR1-2 million per annum on training

budgets, but that little of this is being spent on environmental training *per se*. Workplace Skills Plans and Annual Training Reports should be oriented towards reporting on expenditure on environmental mandate training, as well as generic skills training. Resources allocated to, and mobilised for bursaries through internal skills training budgets, or through partnerships should also be monitored. Partnership investments should also be carefully monitored (e.g. partnership investments in the Teacher Development / Human Resource Development Networks)

3. **Monitoring of catalytic impact:** The third aspect that should be monitored is 'take up' and catalytic impact of the activities in the HCDS, since the HCDS has been designed to mobilise key activities that will have longer term impacts that are catalytic. For example, the initiative to strengthen the quality of environmental education and training programmes should have catalytic impacts in the area of improved performance; while the initiative to establish climate change / sustainable development planning leadership training programmes should have catalytic impact in that more leaders than anticipated could benefit from the training. Monitoring of catalytic impact will show the value of investing in human capital development within a longer term impact framework.

Monitoring at different levels: The strategy will need to be monitored at individual organisational level, as well as at provincial and national levels and should feed into a coherent national system of 'skills knowledge' for the environmental sector that facilitates ongoing skills planning.

ⁱ Formerly constituted as the Department of Environmental Affairs and Tourism (DEAT) and since 2009 the Department of Environmental Affairs operates under the broader Ministry and Department of Water and Environmental Affairs (DWEA).

ⁱⁱ This is estimated based on best available information. Accurate statistics of employment figures in the environment sector do not exist in national data sets.

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