

CHAPTER 6:
DYNAMICS OF PROFESSIONAL AND MANAGERIAL
PATHWAYS IN THE BIODIVERSITY CONSERVATION
SECTOR

INTRODUCTION

The potential for a successful Human Capital Development Strategy (HCDS) in the biodiversity sector lies primarily in its capacity to speak effectively to the needs and priorities of those in the sector, and the many challenges they face in practice. Thus, the strategy needs to speak from the stakeholders' perspective in order to secure legitimacy of the process, and secure commitment and support for the implementation process. This chapter presents the results of a series of semi-structured interviews that were conducted with respondents in a purposive sample of organisations in the biodiversity sector. The key objective of the interviews was to conduct a contextual analysis of the “push and pull” factors that affected the entry into, retention and exit of appropriately qualified and skilled professionals, biodiversity scientists and conservation managers in the sector. The interviews added a more richly textured dimension and possible explanations of the issues and trends suggested in the secondary data analysis on employment and supply dynamics.

The key discussions in the interviews were based on the following thematic areas as suggested in the interview guides:

- General organisational information (number of biodiversity employees, organisational type [government, conservation agencies, research institutes, NGOs, private sector or higher education institutions] and organisational mandates on biodiversity)
- Professional career histories of professional scientists (factors affecting their entry, development, retention and exit)
- Demand for skills (structural and organisational factors impacting on the demand for professional and managerial skills)
- Supply-side factors (the role of schooling and higher education in the recruitment of learners and graduates into the sector)
- Contextual factors that influenced retention, career paths, mobility and staff development in their respective organisations and the sector

- Recommendations to deal with systemic and organisational constraints or blockages

Documentary analysis

In addition to the interviews, respondents were asked to submit organisational information, including the completion of an occupational gap analysis, statutory information regarding skills development and employment equity, as well as documents on key HR-related policies and organisational interventions.

The interviews generally lasted an hour and a half, and were too short to gather information on the size and nature of scarce skills in the organisation. As an alternative, the HR managers of participating organisations were asked to complete an occupational gap analysis in their own time and submit it to the research team. The occupational gap analysis (attached as an annexure) is a form that required the HR manager to compare two scenarios: scenario 1 described the current qualification/experience and demographic profiles of core and generic occupations in the current workforce, as well as the vacancy rate; scenario 2 described the same information but over the next five years (2009–2014). Of the 16 participating organisations, eight submitted occupational gap analyses – a 50% response rate. The remainder did not, or were not able to complete the five-year projection, even some of the larger ones. This inability suggests that there may be a lack of strategic planning capacity in the sector, especially with regard to the role and capacity of HR, which in future may adversely affect the planning, monitoring and implementation of a strategic and forward-looking HCDS.

The information from the gap analyses was analysed and supplemented with information gathered from the workplace skills plans (WSPs), the annual training reports (ATRs) submitted to or obtained by the research team. Owing to the information gaps, the results (which are presented in Chapter 2) were not of sufficient scope to generalise to the rest of the sector. Chapter 5 on scarce skills and training trends also contained training information gathered from WSPs, ATRs, employment equity information and company annual reports. Data from the ESSP (DEAT, 2009a) were also triangulated as far as it was possible. Limitations in the scope and quality of training data are discussed in the respective chapters. The

uneven quality of administrative data gathered at organisational level is an issue to be dealt with in the HCDS, as its planning, monitoring and evaluation (M&E) processes may otherwise be impaired.

METHODOLOGY

A series of qualitative, semi-structured interviews were conducted in a purposive sample of organisations representative of the sector. The target respondents in each organisation were experienced, senior managers in HR (including chief executive officers (CEOs), HR directors or training directors), senior scientists and senior lecturers, conducting research and/or teaching in biodiversity-related science study fields at a selected number of universities and universities of technology (UoT). Semi-structured interviews are an accepted technique in qualitative research to elicit the perceptions and opinions of a set of respondents in a scientific manner. Unlike large-scale quantitative survey data, qualitative research data may only be generalised to the range of organisations and respondents represented in the fieldwork, and not to entire populations. However, every effort was made to ensure the scientific validity and reliability of the interview data collected, including a formal sample design, the conducting of anonymous and confidential interviews to reduce bias, and the use of a formal interview guide. Further, unlike quantitative research, qualitative research provides a depth of insight into dynamics and issues often only suggested in quantitative data. Given the complementarities between the two types of research, both were adopted in the research design for purposes of effective triangulation. Principles of anonymity and confidentiality were followed and respondents signed written consent forms to that effect.

Research instrument design and ethics

Two semi-structured interview guidelines were developed in conjunction with the project executive committee (EXCO) and finalised for approval. The first interview guideline was geared to all organisations, excluding higher education institutions (HEIs). The second interview guideline was more specifically revised for interviews with senior lecturers at HEIs. Consent forms were developed for both sets of respondents. The proposal and research instruments were submitted to the HSRC ethics committee and, following limited revision, were approved for research

purposes. The occupational gap analysis was tested in the first interview, and revised following feedback and fieldwork observation.

Sample design

The sampling frame consisted of all organisations with a biodiversity conservation mandate. A matrix of approximately 40 organisations was developed in conjunction with, and approved by, the EXCO. These organisations were stratified across the following organisational types including:

- National government (line departments and institutes)
- Provincial government departments
- Local government: metropolitan councils and municipalities
- Conservation agencies at both national and provincial level
- Parastatals, including research-related entities
- NGOs & NPOs
- HEIs
- Private sector institutions
- Other

These organisations were further disaggregated by the following operational functions, as defined by their respective biodiversity mandates including:

- Research
- Policy development
- Management of natural resources
- Policy implementation, enforcement & conservation
- Public engagement, advocacy & awareness
- Training & formal education

The targeted sample of stakeholder organisations comprised 21 organisations proportionately stratified across the organisational types. Organisations were purposively selected, taking into consideration whether they represented the broad biodiversity mandate in terms of their operational functions. Once the sample was drawn, contact details were obtained through the EXCO, the internet and other sources and invitations were sent to the identified contact persons, explaining the nature of the research, the type of respondents and the documentation required. Follow-up phone calls and e-mails were made in order to secure interviews with respondents. This process continued from May until July 2009. By early August most of those who had agreed had completed their interviews and submitted some or all documentation. The refusal and nonresponse rates were very low. In most cases, several attempts (up to six times) were made to arrange interviews. None of the organisations refused outright, but one of the key reasons for nonparticipation was the unavailability of respondents due to time constraints.

Table 6.1 shows that the organisational response rate was 76% of the targeted sample, indicating that the results may be regarded with confidence. This does imply that the data collected reflected reasonably on the views of organisations and scientists in the sector. However, a key limitation was that only 50% of the sampled national government departments, provincial departments and HEIs responded, as shown in Table 6.1.

Table 6.1: Description of sample and sample realisation

Target sample of organisations	Realised sample of organisations	Interviews conducted
National government departments (NatGov)	2 out of 4	1 (HR) 4 (senior scientists)
Provincial depts. (ProvDept)	1 out of 2	1 (HR) 3 (senior scientists)
Provincial parks boards (ProvParks)	4 out of 4	2 (HR) 6 (senior scientists)
Local govt (LocGov)	2 out of 2	2 (HR) 3 (senior scientists)
NGOs & NPOs	2 out of 2	2 (HR) 3 (senior scientists)
Higher Education (HE)	2 out of 4	3 (senior scientists)
Parastatals	1 out of 1	1 (HR) 1 (senior scientist)
Private sector	1 out of 1	3 (senior scientists)
Training: other	1 out of 1	1 (senior scientist)
Final response rate:	16 out of 21 (76%)	9 (HR managers) 27 (senior scientists)

National government line departments with a direct or ancillary involvement in biodiversity did not respond to requests for participation largely because of the departmental restructuring that occurred after the April 2009 elections. The fieldwork coincided with a period when senior government officials, who were invited for interviews, were involved in the departmental restructuring process. As a result, despite several attempts, the team could not secure interviews in time. However, information on some of the affected departments was collected, including their annual reports, WSP information and other information on employment and vacancy trends from the DEAT ESSP process. The response among the sampled HEIs was disappointing. An attempt was made to sample historically white universities, universities of technology as well as the former “bush colleges”. The participating institutions covered the biodiversity-related study fields fairly extensively, although in the highly urbanised areas. It is proposed that more research be conducted and information gathered among a wider range of HEIs on the same areas covered in the research. Additional areas may include, among others, the nature and work

relevance of current courses and curricula, turnover of lecturers and sector–HEI cooperation, especially with those who are outside the main centres and/or specialising in biodiversity-related research and study fields.

The interviews were recorded on tape and digital recorder and transcribed. Thematic content analysis was used to analyse the interview data. The key focus areas in the interview guidelines were used as initial indicators of key themes and, by means of comparisons across respondents and organisational types, more specific themes were developed. Table 6.2 provides an overview of the demographic profile of the respondents.

Table 6.2: Demographic profile of respondents

Target sample of organizations	Human Resource	Senior scientists
National government departments (NatGov)	African male (1)	African male (1) White male (1) White females (2)
Provincial depts. (ProvDept)	Coloured male (1)	African males (2) White male (1)
Prov parks boards (ProvParks)	African female(1) Coloured female (1)	African male (2) White female (1) White male (3)
Local govt (LocGov)	African male (1) Coloured female (1)	White female (1) White male (1) African male (1)
NGOs & NPOs	White female (1)	White females (2) White male (1)
Higher Education (HE)	Not applicable	White males (2) Coloured male (1)
Parastatals	White female(1)	White female (1)
Private sector	-	White male (1) White female (2)
Training: other	Not applicable	African male (1)

The key requirement for participation was access to a senior HR representative and senior scientists. These were very broad criteria. As may be observed from the

demographic profile, the HR respondents cut across most population groups and sex, except white males and Indians. In terms of the scientists, 70% of the respondents were white, both male (37%) and female (33%). African males represented about 26% of the final respondents. There were no African females or Indians among the respondents. This particular demographic distribution was a reflection of the history of the sector, as well as the extent to which professional scientific occupations are still predominantly white. Thus, a key limitation of the primary research is that it was left up to respondent organisations to select respondents. Usually a brief explanation of the research brief was provided and organisations could select those individuals it deemed appropriate. Given the sensitivity to transformation in most organisations in South Africa, it is often difficult to dictate to organisations the particular demographic profile of respondents. On the other hand, all respondents had many long years of exposure to the sector, and could reflect with insight on changes and dynamics in the sector. Most participating senior scientists had postgraduate qualifications in biodiversity-related fields, including the natural sciences, environmental science, planning and management. Two senior scientists had postgraduate qualifications in the social sciences. In general an attempt was made to be as representative of the scientific community as possible and to reflect a fairly broad range of ideas and opinions.

PROFESSIONAL PATHWAYS TO BIODIVERSITY

Scientists were asked to provide a short biography of their professional routes into the sector. They reflected on factors during their schooling and higher education years that sparked an interest in biodiversity; factors influencing their development within the sector, as well as the obstacles and challenges they or their colleagues faced en route.

In terms of the qualification profile, with the exception of some scientists employed in the local municipalities, most of the respondents had a postgraduate degree (honours, master's and doctorate) in a biodiversity or environmental study field. In some cases, those responsible for human resources also had postgraduate qualifications in science. Given that the respondents were all at a senior level, their attainment of a higher qualification was in line with general requirements in the sector for the attainment of seniority.

Motivations to enter the sector

As part of exploring their career histories, scientists were asked about the factors that influenced their study and career choices in their family, schooling and university environments. There were several clusters of responses.

The first cluster of responses focused on their “passion” or love of nature, wildlife, lifestyle factors (such as hiking) and the environment in general as motivating their entry into the field. For some this occurred during childhood or as a result of family circumstances.

“My mother gave me a binocular at the age of ten in order to study bird life and this gave me an interest in biodiversity and conservation of the environment”, said one scientist.

“I grew up in a little town where there was nothing much else to do but to go [and] play around in the veld”, said another.

A second cluster of responses revolved around having a “calling”, a “vocation” or a “cause”.

“Work in nature conservation is interesting, but one needs to have a passion/calling for this kind of work”, said another. For some this passion or calling did not start out during their early years, but developed over time. This was especially the case with black scientists who did not necessarily express a passion for wildlife or conservation when young.

“The experience of being in the field, being chased by the animals, and observing the animals, ... I got to internalise conservation slowly”, reflected one scientist on his student years.

Surprisingly, HR professionals also reflected on their affinity for the outdoors, although this was not initially their motivation to enter said organisations.

The next group of responses was clustered around those whose career choices had been shaped by conservation or biodiversity-related subjects during their high school or university years. Thus, some were motivated by an enjoyment of subjects such as biology, science or geography. In a few cases, an initial dislike of such “boring”

school subjects was transformed later on at university. However, for one, *“Nothing at school in (country’s name) motivated me to become involved in biodiversity”*.

These responses suggest that the early years at school and/or university as well as the extent to which subjects were *“interesting”* or had some *“applicability”* or relevance to *“real world problems”*, loomed importantly in shaping eventual career choices. For instance, one scientist recounted that *“a field trip in my second year of university made me change subjects from Biochemistry to Biodiversity”*.

A third group of responses was clustered around role models and mentors in shaping study and career choices. Some recounted interactions with either school teachers or university professors who were inspirations to them.

“Basically it [was] about mentoring by [name of person], I leaned towards biology, had a good memory ...He observed that and it worked well”, recounted one.

A fourth cluster of responses was around those who settled for the “second choice”. In effect, for these people, conservation or biodiversity was not a first choice. This response was often more noticeable among black and/or women scientists. Thus, they reported that their initial intentions were to pursue studies in medicine or engineering, but due to circumstances (poor examination results or lack of funding) they had to settle for something else. They often recalled that available funding, internships or training opportunities, also determined their eventual study choices. For those who started out their conservation careers in the former homelands (where there were parks) such internships were often an entry route into conservation.

“[I] started as a cadet in former [name of homeland], and a bursary... My first choice was medicine, but it was difficult to get good teachers for maths,” recounted one.

“Somewhere along the line I didn’t get into chemical engineering, fortunately I opted for the much nicer side of the same coin, which is Nature Conservation and Biodiversity,” said another scientist.

Finally, some scientists fostered a career in biodiversity as a result of a combination of networks and opportunities. These informal networks included mentors, friends or former colleagues, who created opportunities in terms of studies or employment in the biodiversity sector. For instance, as one recounted,

"I went for the interview ... and met some people I used to know in the old days at [name of organisation], ... it felt like a chat with friends".

These clusters of responses suggest a number of implications for the HCDS. Firstly, there are several points of entry to "making biodiversity visible" in terms of study and career choices for young people or even older and more experienced ones. Thus, while an affinity for biodiversity conservation is ideally fostered when young, possibilities to catch up later on during the higher education years and even later in the life cycle do exist. Secondly, these results confirm that often study and career choices (among these respondents) are shaped incoherently, depending on coincidence and circumstance. Thirdly, the HCDS can create an enabling environment that will facilitate the process of "making biodiversity visible" and increase the chances of optimally utilising the four entry points suggested here: building on existing nature awareness programmes; mainstreaming the relevance of science subjects at school level; the provision of funding for study purposes and/or work experience opportunities; as well as the increased use of formalised networks for information, career advice and so on. The creation of deliberate opportunities is largely aimed at levelling the playing field for all, and to increase access to opportunities for those who may not have direct access to informal networks, for instance.

On the "importance" of money

Importantly, when reflecting on the career motivations of the new and incoming generation of biodiversity conservation scientists, many respondents emphasised the apparent dominance of financial rewards and salaries in the career decision-making process of the current generation of young people and potential scientists. This was in contrast to the fact that none of the respondents themselves cited salary as a reason behind their own career choices. Where salary was raised, this was largely in relation to their own or other's perceptions that biodiversity conservation was not a lucrative career. As one scientist recalled, *"when I completed matric, it was said that conservation was not a career, because you cannot make money out of it"*. Another recalled having to raise her own salary to work in a conservation NGO, as she was told, *"You pay for your salary, you can come"*. Perceptions about the so-called poorly paid or *"volunteer"* nature of the sector were also recounted.

However, in the case of some black scientists, money was important but in an indirect way. Thus, some reported that bursaries or internships were a means towards completion of qualifications and better employment opportunities, possibly in the sector, something they might not have done otherwise. The role of salaries as a supply-side factor is dealt with later on in the chapter, both in terms of recruitment of young graduates and retaining the current pool of scientists.

Perceptions about job-hopping in South Africa, for instance, may point to a generational gap in sociocultural perspectives on employment attitudes. Thus, in the global literature, reference is made to a cultural redefinition in attitudes to work, with specific application to the younger generation, who may engage in “job-shopping” and job change in search of better wages and occupational status (Gangl, 2003:429; Taylor, 2002, cited in Kotze & Roodt, 2005).

Thus, the absence of a more nuanced understanding of the motivations behind the study and career choices of the younger generation may affect the manner in which the sector promotes itself, especially the role of salaries and job status in recruitment and retention. Also, sociocultural gaps that are not dealt with properly in the mentoring relationship, including those on internships or studentships, may jeopardise the outcomes of such interventions. Thus, in the design of mentorships (and ideally in the coaching or preparation of mentors) one of the factors to consider is the extent to which certain sociocultural differences (such as the money issue) may be handled in a sensitive manner to reduce the potential biasing effect of individual opinions and the quality of mentorship. The sector should also consider conducting research on the perceptions of young graduates and learners regarding the sector as a sector of choice for career and development opportunities.

FACTORS AFFECTING THE DEMAND FOR SKILLS

Respondents were asked to reflect on the most important structural factors in the external environment and their impact on the demand for professional and managerial skills in the sector.

External or structural factors

Respondents reported that changes in the policy and legislative environment at the national and international levels were key to shaping the scope and nature of the skills required. Following from this, respondents referred to needing an “ideal mix of skills” to carry out a more complex biodiversity mandate in the post-2004 period. A closer investigation of the “ideal mix of skills” is done in the section that follows. Both of these findings concur with other research in the sector see Chapter 5:DEAT, 2009a, Turpie & de Wet, 2008, Rodwell, 2008).

The second structural factor influencing the nature of skills demanded in relation to the development of a more diverse and transformed workforce is specifically the employment of black scientists and managers in a historically white sector. Together these two factors were confirmed as key challenges for the sector in practice.

Thus, as one respondent phrased it,

“When you are looking for a skills set, plus transformation and [the] equity policies that we have, that’s where there is quite an awkward mismatch, because that is where the highest competition exists for people who have both ...”

To some extent this statement captures a key dilemma faced in the sector, and informs a fundamental part of the debate on scarcity of skills. It informs the next section on the dynamics of attaining equity and transformation in the recruitment of black scientists and managers.

Employment equity and transformation

Most of the respondents were white, a potential confounding factor in a discussion on transformation in the sector. This is partly because South African opinions about employment equity are very divided on the issue, often across racial lines. However, the responses were relatively balanced on the whole. For instance, in one case a respondent even reported that, in its quest for transformation, an unintended consequence was that the organisation had become “too black” [African] as 86% of the workforce was black as opposed to the equity target of 80%.

“We will need to put on our advertisements, whites only.” This was in response to the lack of applications from whites, coloureds and Indians to job advertisements.

In general, respondents accepted transformation as a given in order to make the professional and managerial layer of the workforce more representative of society. The most common reported challenge was to find blacks, mostly Africans, but also coloureds and Indians, who had a relevant qualification and, if they had a qualification, ones who had experience. In general, respondents reported that parts of the sector, especially the public sector and academia, were male-dominated, especially in the scientific field. In the NGO environment, the senior level was described as “*hugely masculine*” and in need of “*transformation*” although at other levels women formed the majority. The male-dominated profile was confirmed by the LFS employment data (chapter 2, Figures 2.9 and 2.10) that showed that men dominated employment at these levels. At managerial level, while white men continued to dominate employment their numbers were declining, while the number of black men (and to a lesser extent black women) and white women were increasing.

The observation (about male dominance) during the fieldwork may also have more to do with the fact that differences may occur at the senior scientist level where a doctorate may be required. Thus, the HE supply results showed that, in 2007, the male: female ratio was 60:40, while at master’s degree level it was 50:50 (see chapter 4, Figures 4.10 and 4.11). Thus, finding female candidates with a master’s degree should be less of a problem compared to finding one with a doctorate. However, employment figures showed that there was a large increase (albeit from a low base) in black women in particular in the managerial and core professional occupations (see Chapter 2, Figures 2.9 and 2.11). Yet, in absolute numbers there were fewer black women at the professional and managerial levels compared to all other groups. This was largely because black women started off a very low base, and were still playing catch-up. It suggests that the transformation goals in the sector have not been as successful in terms of the development of black women, as they have been for black men. Thus, sector employment trends showed that while women in general were well represented, black women as a group were not, despite massive improvements in their qualification levels up to master’s level. Except for one or two organisations, the recruitment and development of black women did not emerge as a key issue, however.

There was a perception that, while the lack of black candidates was a problem in the rest of the SET sector as well, the biodiversity and conservation sector was at a particular disadvantage. This is largely because blacks are regarded as more mobile; firms report that they leave as soon as they get recruited (Booyesen, 2007:50). On the one hand, it is true that the South African economy and labour market have not been immune from the globalised “war for talent” or shortage of skilled workers (Kotze & Roodt, 2005:48). On the other hand, the South African talent and turnover challenge is somewhat different in that it is often described as the “war for top black talent” as well (Cruz, 2006).

In the interviews, reflecting the challenges in this search for black talent, was the emergence of a profile or an ideal-type [black] candidate. One respondent called it, *“the overall package”*, which had as its most basic requirement, the idea of a *“calling”* or a *“passion”*, as in *“... we depend heavily on people having a passion for conservation”*, or as expressed by another, *“Work in nature conservation is interesting, but one needs to have a passion ... a calling for this kind of work”*.

In addition, “hard” or high-level science skills were required, including a formal qualification in the sciences. There was a range of entry requirements, as different organisations had different operational requirements. On the one hand, there were some who preferred new entrants to have postgraduate/higher degrees. This group indicated that their organisations accepted entrants with honours qualifications, and more rarely those with a first degree. In others, a master’s degree was required.

“People with high qualifications are required at an entry-level job. At least a master’s degree is required”.

Another indicated that the organisation accepted those with an honours or a BTech degree *“to get people into the technical field in conservation”* or *“Scientists need an Honours ...”* and *“the technicians, they need a BTech at entry level”*.

Except for NGOs, none of other organisations mentioned having an NDipl as an entry requirement.

Interestingly, however, the LFS results showed that the sector appears to be employing an increasing proportion of professionals and associate professionals with qualifications even lower than an NDipl at FET and GET levels (see Chapter 2:

Figures 2.16–2.18). Therefore, while the fieldwork indicated that the entry-level requirement was generally higher than NQF 6, the LFS results indicated a general decline in the overall qualification levels of the sector to as low as general education and Matric. In the absence of a qualification/skills audit of biodiversity organisations it is difficult to verify the LFS finding, but given the high vacancy rates and the general challenge to find suitably qualified and experienced scientists, it does appear likely that the sector was increasingly employing at qualification levels lower than those required by the occupation. In order for the HCDS to establish the quality and quantity of the sector skills base, given the new and more complicated operational requirements, a skills audit may need to be considered. Alternatively, where institutional audits have been conducted, such data may be consolidated to establish a sector profile of qualifications.

Finding black candidates with the requisite master's qualification was generally regarded as difficult. Getting the "cream of the crop" with either a master's or PhD degree, that is, top black postgraduates, was regarded as even more difficult.

The supply data showed that there has been a growing number of postgraduates at honours, master's and doctoral level. Generally, the key challenge was to increase the transition from honours to master's as is the case in the rest of the SET sector. However, the number of postgraduates remained insufficient, as the biodiversity pipeline in 2007 had just under 1 000 honours graduates (54% black) and 500 master's (46% black) available to the entire economy. Therefore, the supply patterns suggest that the scale of increase may not have been sufficient (given competition from other sectors). This also implies that those blacks who are acquiring biodiversity related master's and honours degrees are either not attracted to the sector for a range of reasons, or the sector present barriers to entry.

Given the low rates of past and future employment growth (all the sources of data confirm this, whether LFS data, Vulindlela public sector or the participating organisations), the prospects of getting the "*total package*" appear very unrealistic. The only group that is expected to grow in employment is the associate professionals. Over the two periods (2000–2003) and (2004–2007), the share of first degree and postgraduate degrees among managers remained fairly constant, just over 60%, with a 6% increase in the number of postgraduates. However, over time,

the share of those with an NDipl declined and appeared to have been replaced by managers with a general education qualification. Among professionals, the decline in the level of qualifications was even more worrying. The share of those with NDipl doubled from 10.5 to 20.8%. At the same time the share of PG and first degree dropped by 6% respectively. The share of those with FET level qualifications (NQF 4) increased nearly three times.

The evidence suggests that in reality employers may taking what they can get, despite the stated challenges of the work readiness of the current group of graduates.

The qualifications of graduates were often criticised as being too generalist, when specialist qualifications were required. Thus,

“a degree in Environment and Earth Science with the social science and political component is useless to [name of organisation]”.

White males were thought to specialise more at honours and masters level, as opposed to very few Africans, coloureds and Indians. Those with so-called “generalist” degrees may be “appointed in some public role”, but will not be involved in biodiversity research. It was not entirely clear what a specialist degree consisted off, as at times respondents referred to a master’s degree or an honours degree. There does appear to be a suggestion that black candidates who had relevant qualifications, that these were often not of the “specialist” types apparently required in the sector.

Another set of skills suggested in the “ideal-type” graduate including having other (technical) skills, such as the ability to write coherently (e.g. project reports) and having a driver’s licence (in the provinces drivers have to be allocated to new graduates who cannot drive; graduates are taught to drive in certain cases; in protected areas the ability to drive an off-road vehicle may be a requirement).

Respondents also indicated that a formal technical qualification was necessary, but often not sufficient as certain soft skills were required, as emphasised by one respondent

“... networking skills and communications skills are essential ... you certainly don’t want a young cocky graduate and go handle [clients].”

“We are looking for a holistic person ... not just a science degree.”

This requirement was in line with other research that shows that the changing nature of the work required good communication skills to handle local communities and private land-owners in protected areas, as well as the public in general (DEAT, 2009a; Turpie et al, 2008).

The final entry-level requirement was having some work experience or work-readiness. While it is common for new graduates generally not to have work experience, the evidence suggests that there was an expectation among the respondents for new graduates to have some work experience, and a certain level of maturity. This may have to do with the fact that replacement demand (due to death and retirement) in organisations is high, given high vacancy rates, perceptions of high turnover, and an ageing, white scientific workforce. The rate at which the education system is replacing new graduates who have the requisite qualifications (and the requisite level of experience) may not be in tandem with the rate at which replacements are needed. However, the emphasis on work experience in a country with such high unemployment may seem unreasonable, and a potential barrier to entry.

There were others who disagreed with the “total package” requirement, as voiced by one respondent who felt that: *“the guys who are talking about barriers [quality of training etc] are arguing as if today you take on the person, and then tomorrow they are in the oven, baking.”*

There was an implication that there was an unrealistic expectation about the readiness of new graduates or diplomates for the workplace. As another put it: *“new graduates apply, but there is a demand for people with experience”*.

Another felt that it was unfair that interviewees applying for internships were asked about their work experience.

The development of the Inyetla work-readiness programme run by JIPSA was mostly in response to the fact that employers are now requiring levels of work-readiness not possessed by most new graduates. A similar programme is the NSTF-run National Youth Service (NYS), a volunteer programme for unemployed science graduates who are placed at science centres. They attend training programmes that include life

skills, communication skills, project management and IT geared at improving work-readiness to facilitate employment or to continue with further studies. The NYS programme includes a mentorship programme.

Another suggestion was to adopt an “all-comers” approach, that is, to accept graduates and diplomates, irrespective of the quality of their qualifications, and provide them with some work experience. The argument was that those with the necessary will and enthusiasm would be the ones to remain, as the weaker ones with eliminate themselves by dropping out. The feasibility of this approach in most organisations (with limited resources) may be questionable, but larger organisations may well be able to absorb the cost. However, the main point was that the expectation of well-rounded graduates or diplomates (straight from university) was unrealistic. Another take on this position was that *“qualifications [are] not as important as enthusiasm and commitment”*. Thus, tradeoffs were often made in the choice of candidates, and no one factor was necessarily more important than another in the decision-making process.

In summary, skills development is a means to attain employment equity, and should be adopted as a basic principle by the HCDS, strengthened and up-scaled. One of the examples cited at local government level was that honours students who showed potential were selected to participate in an internship programme to study towards a master’s degree co-funded by the organisation and the NRF. The bursary condition was that students work for a specified period after completion of the degree. This approach requires a good relationship with relevant university departments in order to select a group of students. Thus, the establishment of internships or studentships in some organisations to attain more specialised qualifications (masters or doctoral degrees) among black candidates especially is a key initiative in the HRD strategy in the public sector as well. The supply data show that there have been improvements in the supply pipeline, yet it appears that the sector has not benefitted sufficiently. Alternatively, where black candidates applied they were either not in possession of the “required” type of higher qualification or did not have the requisite work experience.

The requirement for work experience among black candidates (not new graduates) also presented difficulties. The general observation was that most experienced

scientists were white and very few blacks had the requisite experience. One respondent took a historical view on this, reflecting on the exclusive (of black people) nature of the conservation field in the past as a key reason why there was a lack of experience at this point: *"... it is difficult to get experienced employment equity candidates into conservation, simply because it is rare and you know there's a history that goes with where conservation was normally."*

In one case, the organisation decided to limit the years of experience required in order to recruit: *"... there are not many people with the requisite experience ... we have to cap our appointment requirements at about 2 or 3 years. There's absolutely no way you can cap it on 5 ... you won't get any person if you cap it on[at] 5."*

While this approach may represent a risk, in that the person may not be fully productive immediately, a support programme to aid development may be appropriate.

There was evidence of an emerging, long-term approach in that many organisations adopted support initiatives to support candidates to fulfil the *"total package"* requirements. One of these included the development of structured fast-tracking programmes to ensure that incoming black graduates gained the requisite experience. Others included the provision of internships and studentships. However, many reported that funding has already or may in future restrict their capacity to maintain these programmes.

A respondent in a government position felt that the work requirements of certain jobs often did not justify a master's degree, as the work duties were interpreted in this case as administrative work and thus not related to such high level studies. A more pragmatic approach came from one respondent who suggested that given the diversity of the sector in terms of its scientific requirements, no generally applicable scientific standards may apply in their work and therefore their qualification requirements. Thus, those parts of the sector that were *"not in the exact sciences"* did not need rated scientists, for instance. Entry requirements may differ between, say, SANBI, SANParks, the CSIR and an NGO in terms of the depth of scientific knowledge required.

In conclusion, there appears to be a relative scarcity of black graduates with the requisite qualifications, soft skills and experience required in the sector. Given the

increased and complex policy demands, the expectation of certain levels of work-readiness among new graduates may be unrealistically high, and beyond the range of competencies generally possessed by new graduates. In reflecting on the career trajectory of most of the scientists in the study, most had had long periods of organic career development themselves, through the support of mentors, and both formal and informal networks. This raised the question as to whether the current generation of scientists had realistic expectations with regard to the growth process of the new generation, given that they themselves had undergone organic career development processes and did not become overnight successes. The extent to which the ideal-type profile approach is realistic and realisable in the sector needs to be considered, as well as the extent to which elements of it may represent more of a barrier to entry than a facilitator of transformation.

Changes in global and national legislative contexts

The global and national legislative context of conservation has changed and has created a huge demand for a complex set of biodiversity and conservation skills, relating to, among other things, information management and norms and standards regarding policy implementation in the sector.

“The legislation definitely did drive the process ... we now have to feed in proper environmental information into the process, where previously garbage was fed in.”

“The convention for biodiversity to be a part of the international community in terms of biodiversity management, you have to conform to certain norms and standards.”

“Biodiversity tools are fundamental to town planning, landscape planning ... and that is an achievement.”

“... increased recognition of the importance of better environmental management ... created a huge demand for skills.”

Universities have also experienced this trend as there were increasing numbers of departments now offering integrated conservation and biodiversity courses.

In describing the sea change in required knowledge and skill levels, given the legislative and socioeconomic imperatives of biodiversity, one respondent indicated that reserve managers used to be like *“traffic cops”*, in terms of their enforcement

role, which was based solely on the administration of punitive sanctions. The multifaceted nature of skills required by conservation managers is now an established fact (Turpie & de Wet, 2008: 58). This is evidenced in that more nuanced approaches to conflict management with stakeholders such as communities and landowners were required in new and specialised areas such protected area management; and realising the socioeconomic benefits of biodiversity and conservation for communities. One respondent articulated the need for softer skills, as well as maturity to understand community development processes, and the ability to communicate well, as follows,

“... it involves communities, more and more it’s involving people, when you look at stewardship, it involves relationship building, ... there is a need for ... more holistic training.”

Another commented on the complex combination of skills required from resource managers: *“... it was difficult to find a resource manager ... with the right mix of skills, such as networking skills, science background, capable to work with knowledge workers (and not only with technical workers), can handle stress, bring in funds and have leadership skills.”*

This echoes the findings from other sources in terms of the multiskilled profile required of conservation and environmental managers (given the policy framework such as the CBD for instance) (Turpie & de Wet, 2008: 58) including

- technical skills in a specialist area (which may include a formal qualification in the sciences)
- “soft skills” such communication with local communities, tourists and the public (social facilitation skills)
- an understanding of the regulatory and legislative requirements
- project management skills
- financial management skills.

At a local government level, among the array of skills required were *“managing biodiversity in an urban setting”* and *“understanding how ... local government works relative to the EIA legislation and EIA processes”*.

Flowing from the co-dependency (between tourism and biodiversity) in the parks, one scientist described the considerable mix of skills required by parks managers, including the *“basics of scientific aspects, ... people management skills... financial management skills for tourism since you handle money,, monitoring service providers (who have concession agreements), ... law enforcement skills, ... the social aspects as most of the protected areas are under land claims ... and the needs of the broader country to consider”*.

At local municipality level this multifaceted skills mix was described thus,

“ ... who’s a good communicator and at the same time understands green procurement and ecotourism.”

Law enforcement capacity at provincial and national level was often questioned, especially with regard to the competence of officials at these levels. The availability of training that combines this vast range of skills should be looked at. However, despite the vastly increased range of responsibilities, there is evidence to suggest that training provision for managers declined across all spheres of government (see Chapter 5).

Another respondent sought to direct attention to the lack of business project management skills and biodiversity knowledge often absent among local and provincial government managers to an understanding of *“why environmental nurseries [providing plants towards mine remediation projects] were not working, because there were so many failures”*.

Another new area included an understanding of the integration of IKS in biodiversity and conservation.

External factors, especially in terms of the policy frameworks in the sector, had an impact on the types and mix of skills required. Thus, in terms of the existing and more experienced workforce, ongoing skills upgrading in critical skills and new knowledge areas may be necessary given dynamic developments in the sector. The effects of the recession may limit the capacity for new recruits, and more of a focus may fall on upgrading the existing workforce. The qualities described under the skills profile of conservation managers or new graduates are not necessarily found in university degree courses. A menu of courses specifically designed for the

development of these profiles should be considered with existing providers in the sector.

Decentralised model for managing biodiversity

The governance implications of the division of responsibilities for biodiversity conservation, especially between the parks and the provincial government departments, inside the protected areas and outside the protected areas, also had implications for the skills profile required. Some felt that the current system was very inefficient and led to duplication of effort as it stretched the existing pool of skills and expertise too much. This was in line with other findings regarding the sub-optimal use of scarce skills in the sector (Turpie et al, 2008). Also, some argued that at provincial and national level there was little capacity to apply and enforce the new legislation competently, largely due to a lack of skills and knowledge.

Funding of the sector

One of the most common frustrations expressed by respondents was the lack of sustainable funding. This cut across all organisations, whether private sector funding for NGOs (for capacity building of young graduates), staffing needs in HE or internships in government departments. In addition, there was an overwhelming impression that while there was a nominal appreciation of the role of the sector, this was not always translated in practice. As one respondent in the provinces, expressed it:

“We are still last in line with resource allocation.”

Some indicated that they had to cut down on recruitment and instead had been focusing on internal skills upgrading:

“We cannot recruit at this point in time, so we have to skill up those we have.”

The dictates of financial sustainability loomed large for most organisations, as the economy moved into its first recession in 17 years, and the first post-democracy. Thus, increased commercialisation of the parks, for instance, was raised as a challenge given government targets for biodiversity conservation to generate income in a co-dependent relationship with tourism. Some argued that this “*sideline[s]*”

conservation, which in effect received less funding even though “[it] is the actual priority”.

Ironically, one of the post-election decisions was to separate tourism from the environmental portfolio in the former DEAT. The research could not explore the HCD implications of the paradoxical situation where, at governance level, there was a separation of functional responsibilities, but at implementation level tourism and biodiversity conservation continued to be co-dependent. This may be one area to explore in future work.

Universities cited the lack of funding for new posts or replacement posts as a key obstacle to capacity to upscale the supply of lecturers. Similarly, declines in funding by the National Research Foundation (NRF) were cited as hampering the development of research projects through which to attract students.

The recession is likely to result in more budget cuts (see Chapter 1) placing more pressure on the sector to meet its growing capacity needs under the legislative framework with fewer experienced staff. Thus, the HCDS priorities are likely to be circumscribed by funding constraints.

The public image of biodiversity

The impression that biodiversity specifically and conservation in general are dominated by whites and, in particular white males, was echoed in the interviews. The fact that most respondents were white confirmed this profile. While the research cannot be regarded as representative of perceptions of black people, it was useful to reflect on the careers and histories of the black managers and scientists in the sector. Thus, when reflecting on their histories in and through the sector, a number of interesting observations were made by the black respondents to responses from their peers and families about their career choices.

The first related to the disconnection of young black people from the land and nature in general, while the second related to the aspiring images of socioeconomic status and progress for the younger generation and their families.

Some respondents noted that there was a perception that black graduates (or learners at school) may not share a passion for the sector, so often regarded as the *raison d’être* for staying in the sector. One respondent felt that the *“detachment of*

the younger generation from their communal lands” may partly explain why they did not share this affinity. While this was not a common response, it may be worth exploring so that a more nuanced response can be developed in making the sector more attractive to both young graduates and their families. For instance, the new black generation is highly aspirational; their economic options have increased, and land (associated with biodiversity and conservation) is no longer regarded as the source to accumulate new wealth. Also, they do not share the memories of land dispossession, a phenomenon well-remembered by older black generations who had a closer association with the land as a potential source of wealth. That association was decimated by colonial and apartheid land dispossession. Thus, for a sector that is still partly associated with such a painful history for many older black generations, as is evidenced through ongoing land claims, parents of young science graduates may regard entering the sector as a waste. The extent to which capacity building of a younger generation in eco-tourism whose parents are party to land claims may be one of the tradeoffs to be considered in extending socioeconomic benefits of biodiversity. Wealth is now associated with an urbanised lifestyle that is summed up in the following comment.

“To some degree there seems to be, for black people, less adventure in it because it’s like, I grew up herding cattle and now you want me to go back and herd some different kind of cattle.”

This particular explanation rings true when one considers that part of the reason why many land resettlement or land restitution programmes fail often hinges on the lack of skills in the younger generation or their lack of desire to return to the land, unlike the older generations.

The lack of a sophisticated image associated with the sector is evidenced by the following observation:

“... they’re like oh my goodness, where’s the doctor, or, so you want to be a volunteer all your life?”

Other respondents reported that wearing a *“khaki uniform”* in the case of rangers and conservation managers or the *“battered bakkie”* image, as in the case of scientists were unlike desirable images aspired to based on the CSI TV drama or *“white [laboratory] coat”* types aspired to by young blacks. Thus, images of socioeconomic

progress were not associated with the sector. Alternative images need to be cultivated of rangers, scientists or conservation managers, perhaps in tandem with raising the status of the profession through better communication.

The accumulation of material possessions (not necessarily the accumulation of wealth), including a well-paid job, a house, a car and good schools, are all signs of an emerging black middle class, a stage through which much of the white population had gone through under apartheid. Thus, one respondent expressed the view that as the basic needs of the black professional population are gradually satisfied, other higher order needs (and often less tangible) will be articulated more easily, including a passion for biodiversity conservation. The process of conscientisation was therefore a long-term process, or “*a social process*” as articulated by another. However, there is huge scope for such processes, inherent to the developmental mandate of the sector, as it helps to realise positive economic spin-offs for communities from biodiversity conservation.

The stories of the participating black scientists, as they recounted their experiences in and through the sector, illustrated that it was possible to overcome inhibiting factors. A recommendation is that black and women role models be explored as a key intervention to motivate and make biodiversity conservation visible to learners and teachers. For instance, the SET4Women advisory committee in National Advisory Council on Innovation (NACI) commissioned a study on women role models, tracing their life and career histories to understand the factors for success for women scientists, as well as obstacles faced in school, academia and the workplace in the SET field (Maree, Maree, Botha & Gcabo, 2008). This model may have two purposes. One is to develop case studies of role models, blacks and women (outstanding scientists and conservation managers) as a marketing tool; secondly, to conduct a more in-depth investigation of the dynamics of entry and retention of senior black scientists and managers in the sector. There are already initiatives in the sector that may just need to be up-scaled. SANParks distributes a nature magazine which provides short histories of key personnel and traces the development and career paths of scientists. The mainstreaming electronic interface developed by the SANBI directorate on education and awareness may be one platform through which to develop and promote the idea of relevant role models.

Role-model histories may represent an alternative and interesting means to distribute career guidance information, drawing from the real-life experiences of people.

With regard to the promotion of the social and economic importance of the biodiversity conservation in the life of the nation, it was felt that despite the growing acknowledgement, the sector was still not in the forefront of the imagination of politicians and the communities in a positive way. Some thought this was due to the lack of a “*people-centred*” approach to biodiversity and a predominant focus on plants and animals. One recommendation was to consciously develop “*champions*” for biodiversity, that is, prominent public figures whose main task it would be to raise the profile of the sector in terms of its relevance to society and its role in the life of the nation. In light of the mixed messages arising from the MTSF (pro-biodiversity) and the industrial policy (commercial focus) (see Chapter 1) there are both risks and opportunities in the current situation, and engaging and extending the political (and funding) space to facilitate the HCDS will be important.

Organisational factors

At an organisational level, a number of factors were put forward as impacting on the nature and size of skills demand and availability.

Employee turnover or rotation of skills

A range of attitudes emerged with regard to voluntary turnover, that is, through resignations. Employee turnover was often associated with race, in that black people were perceived to be more mobile and white people tended to stay because they lacked mobility as a result of the effects of employment equity. This, it was argued, contributed to the relative scarcity of black scientists. Several examples were given of black recruits who had left shortly after training, representing a loss of returns on investment in training. There were also claims about “job hopping”, often linked to gaining work experience and increased salaries. For instance:

“There is lot of job hopping in this country. It’s huge! ... they are coming for experience. In 3 months they will be gone.”

“There is massive turnover in ... it’s that younger and very mobile thing ... and it’s also very marketable people, so retention is an enormous challenge”, said another.

However, given that one of the key requirements of the ideal-type biodiversity professional was work experience, new candidates are simply reacting to that requirement. Providing experiential training is a double-edged sword, however, as the person in training immediately becomes more marketable to other organisations without the cost of investment. Perhaps a more realistic approach may be to identify alternative sources of funding where the cost of such experiential learning could be recouped. For instance, the National Skills Fund (NSF) pays work experience grants which may be one way to recover costs.

The more long-term approach (as discussed in Chapter 5) is to accept that turnover among young black staff is inevitable, but also reflects a global phenomenon among young people. Cappelli cited in Sutherland & Jordaan, 2004, argues that “... you [the organisations] are managing a river, not a dam”. (see Chapter 1). This refers to an expectation (perhaps unrealistic and outdated now) that individuals will stay permanently, contrary to expecting a “continual flow of people through the organisation” (Ibid: 63). Finally, the study’s authors suggest that organisations need to develop systems that provided “challenging work, career development opportunities ... [and] rewards based on individual performance” (Ibid:63).

This view is echoed to some extent by the following comment:

“We don’t have trouble retaining young black staff, because they’re busy growing ... but once they rise up to the level of PhD with 5 years’ experience, they become as scarce as hen’s teeth.”

These suggestions about retention also apply to the reduction of turnover among older and more experienced staff. Turnover among white staff (with more years of work experience), it was argued, resulted in a loss of tacit knowledge and institutional memory, which was cited as a concern, especially with regard to the mentoring of new staff. Reasons for departure included lack of career opportunities, lack of job variety and challenges, and low salaries. Some moved into consultancies. There was also a view that organisational and management culture may play a role in the high turnover in the sector. At senior level, the sector was still dominated by white males and this, some argued, was not welcoming for new recruits. This was

reflected in the comments by a respondent, “...*when you come into an organisation that is really white-managed ... there’s always an impression that you’re always having to prove your competency and I found that so tiring*”.

On the other hand, another scientist took a more positive view and felt an obligation to be technically competent since, “... *after the excitement of democracy South Africa needed black managers ... people who are nerds, not just being on the board and waffling intelligently*”.

The movement of staff was often within the sector, from the public sector to the private sector, from research institutes to universities and so forth. When people left to set up consultancies their skills were still available to the sector, although at a premium. As a result there was a view that when professionals left, their skills were usually not lost to the sector, and could “*open doors somewhere else*” as former staff moved into decision-making positions elsewhere in government for instance. This was regarded as a form of skills rotation within the sector, rather than a complete loss to the organisation. While there were many claims of high rates of professional turnover in the sector, there was very little quantification of the size of the turnover. In the documentary analysis more information was collected on turnover, which is dealt with in chapter 5.

However, in the public sector inefficiency was cited as a reason why vacancies often remained unfilled for extended periods. Vacancy rates and turnover are discussed in Chapter 2 and Chapter 5 respectively.

Ageing scientific workforce

Many respondents reported that the professional workforce was ageing, as senior and experienced scientists (generally white) entered retirement age and left organisations. While no evidence was provided as to the rate at which researchers retired, their loss as potential mentors was a concern. Therefore, replacement costs may be quite high and the skills of those in retirement may be lost forever, including the tacit knowledge that can only be acquired over time. This constitutes a counterproductive way in which to work towards transformation, as the workforce will become less white, but also less skilled. The measurement and projection of replacement demand, that is, the rate at which employees leave owing to retirement,

mortality and migration, is important for efficient HCD planning on skills demand and potential skills gaps and should provide an understanding of the lag time needed for the education and training system to produce replacements. Consolidation of this data is an area where the HR divisions should play a key role. Suggestions about post-retirement positions, similar to professors at universities who continue to publish, was cited as a way to retain some knowledge. The suggestions included programmes for those who were close to retirement or in retirement to provide mentorship based on an incentive system. If funding can be procured this could be based around research projects.

FACTORS AFFECTING SUPPLY OF SKILLS

Respondents were asked to reflect on those issues on the supply (education and training) side in terms of schooling and higher education that may impact on the nature and size of skills supplied.

Status of biodiversity as a profession

As noted previously, as a result of a plethora of legislation in the post-apartheid era biodiversity has become much more important in the economic life of South Africa. However, question marks were raised about the professional status of the sector in the eyes of the public, from where new professionals and managers would be recruited.

Some felt that the poor marketing and promotion had much to do with the lack of connection made between scientists and the public, students and politicians. At another level, it was felt that the sector was slow in becoming socially relevant, in realising its legislative mandate to ensure that biodiversity natural resources improved the economic livelihood of surrounding communities. One respondent felt that *“it is always plant and animals, and never about people”*.

Furthermore, the “proactive” rather than “reactive” involvement of biodiversity scientists in development planning (at all levels, local to national) was not actively promoted. Others felt that the problem had more to do with the dominance of scientists in promoting the message and their inability to communicate effectively outside of journal articles and conferences, and moving beyond the *“nerdy image”* so

often associated with scientists. The relatively low status of the profession was underpinned by perceptions of low salaries compared to other professions requiring a science background, as well as the lack of exposure of the profession in school and higher education. The perception of the sector as being a low-salary environment is worth investigating in order to verify and provide more reliable comparisons than is currently the case. The role of salaries is discussed later in the chapter.

At school

At school, despite the inclusion of some biodiversity aspects in the curriculum, *“biodiversity and conservation [are] not seen as the core business of the curriculum, always as an add-on”*. This observation was related to the lack of training of teachers in the area, which may result in a lack of emphasis on related subjects and their relevance. The lack of effective and informative career guidance and career information was seen as major challenge. There were differing views as to the usefulness of certain school-based initiatives to instil a love of nature and biodiversity. Some felt that there was a lack of exposure to environmental school programmes. However, others thought that *“eco-schools ... environmental clubs ... cubs”* were not as fashionable anymore, thus closing off a traditional avenue for recruitment. The extent to which environmental education was still a priority in conservation was also questioned. Others thought that some of these initiatives, such as career days, the Sci fest and so on, were regarded as a “holiday” by learners and that they (universities who exhibited) did not notice a positive return on investments, as in learners enrolling for related university courses.

“... the majority of these schools don’t go on these excursions often, so when they go on these camps, they see it as a place where [they] ... can relax a little etc ... not to learn about conservation.”

Thus, the impact of such initiatives in terms of appropriate study choices was questioned. Further, owing to a lack of information as well as heightened aspirations, families often encouraged learners to enter degree courses that will allow them to enter the more recognised professions of medicine or law, *“I mean nobody mentioned conservation”*.

An interesting observation was that even where information was given, it often focused on technical aspects such as subject choice, instead of giving learners a feel for what the career was really about. The example of life and career histories of scientists was cited. Also, there was not sufficient focus on career choices in the lower grades, such as Grade 9 where subject choices were made (see Chapter 3). While there were differences in the efficacy of various interventions, the common agreement was that awareness needed to start early, at primary level, as *“interest is stimulated before tertiary education usually”*.

“Career guidance came too late in matric ... in Std 7 [grade 9] is crucial ... they discussed more what you study at university than the life you lead in that career.”

“I might have known that science existed, but for me science was a BSc, and I did not like chemistry. ...I never ever knew at school ... [about] fieldwork, research in plantations, ... tracking devices, all exciting ...”

“If the exposure is more on TV programmes ... real interviews with people who do conservation.”

University lecturers confirmed that students' choices were often based on no or partial information. Study choices were often influenced by the conditions of funding, or alternatively whether they regarded a particular qualification as an alternative means to get into a career that they preferred. For instance, for students who could not get into the medicine or dentistry stream, doing a general BSc was one way to get into those streams eventually.

A more worrying factor is an apparent decline in interest by Grade 12s to enter higher education. A study by Cosser (2009) on plans to study further showed that while the intention to enter higher education was still the top choice, it declined from 86% (2001) to 56% (2005) among black learners. Interest among white learners dropped from 82 to 75% over the same period.

The asymmetry in information available to learners at school and at university was reflected in a general agreement (among respondents) that there was a lack of collaboration and partnerships between schools, the sector and HEIs, an issue that should be high on the priority list of the HCDS.

In higher education

Respondents often raised concerns about the quality of new graduates, their knowledge levels and general work readiness. In turn, in higher education there seems to be differing interpretations as to the basic competencies of students, especially in light of the recent controversial Yeld (2009) report about the low competency of first years in mathematics and literacy. The views expressed were equally split between a historically white and a historically black *university*. Thus, in the historically black university it was felt that even those on the BSc courses often lacked basic foundational skills and competency in mathematics, reading and writing.

“... basically half the time is spent on reading, writing and interpreting and a little bit of academic work. They can’t read and write in general.”

Furthermore, they felt that despite outcomes-based schooling students did not have problem-solving skills and could not think creatively nor take initiative. However, in the historically white university, the respondent felt that the success of students depended more on the lecturer than on the students themselves. It was acknowledged that some students will always struggle, a problem not particular to any one group. To some extent, the fact that the universities had different entry requirements (some have entry tests) may have had some role in these differing interpretations. Universities with higher entry requirements are more likely to attract a better performing student. Thus, there was a view expressed that certain (historically black) universities will not attract top students, who tended to be attracted to better resourced, historically white universities.

Questions were raised about whether the general university entry requirements were too high, especially in certain science courses. One respondent made the following remark:

“Entrance level for BSc require high school marks in maths and science and the university does not lower these requirements which are unnecessary high. To study Plant Science it is not so critical to have high marks in maths and science.”

Furthermore, there was a suggestion that given that the sector was competing with more lucrative careers, such as engineering and chartered accountancy; it had to become more realistic about the type of graduates it could get:

“... because any black person with an A in maths, an A in physical science, will go into actuarial science, medicine, chartered accountant, etc. ... we will have to settle for those guys with the 55%, or 60%, because black people above that are out of our reach. We should be realistic, take those guys.”

Often students did not continue to study at postgraduate levels because of family pressures to become employed and earn an income. Thus, those studying at a higher level (master's and PhD) were often the cream of the crop and easily picked up by large companies. This tends to echo the findings in the LFS which found that despite an increasing share of black postgraduates in biodiversity-related fields, fewer were entering the sector. One way to address this problem was through the sponsorship of studentships and internships of those who wish to pursue postgraduate studies, a suggestion raised earlier on.

The declines in NRF funding and the lack of collaboration with industry (as an alternative source of funding) were also cited. However, an example was cited of a private sector company that participated in a joint university–industry research partnership, which included the funding of a capacity development programme enabling students to obtain their postgraduate degrees. In this case, hardly any of the new graduates were employed by the company, and they all joined other organisations in the sector. In this case the company was able to train above equilibrium or what they needed, a situation that may not necessarily be the case in the sector.

The supply skills mismatch

There was a general agreement that there has been an increase in the supply of graduates, but not necessarily with qualifications in line with the needs of the sector. Thus, many respondents felt that there was a mismatch in the skills supply from higher education:

“... it (universities) is more focused on what the institutions want ... not what is happening out there.”

However, there were differing interpretations on what the sector requirements were and the nature of this mismatch. Some felt that often graduates lacked depth of knowledge and had qualifications that were regarded as too general and not

specialised enough to attend to issues and problems in the working environment. Sometimes this was related to the substantive content of the qualifications, and its relevance. There was no clarity as to the difference between generalist and specialist qualifications. In one sense, it implied postgraduate qualifications, specifically honours, masters and higher. Thus often the qualifications were regarded as

“... hopelessly inappropriate for what we need”

“The university train too many generalists with insufficient background”

“... too many generalists and too few specialists”

“... they do not even have the basic skills”.

On the other hand, others argued for multidisciplinary graduates and were opposed to discipline-specific type of training, which was the current output of the universities.

“... hiring from universities that were still discipline-specific and you’re looking for people who span disciplines”.

There were differences of opinion on the appropriate skills mixes, as one felt

“... the social science component was useless for this department”.

Another, who had an MSc, felt that with a social science background she might have done her job better because *“... a lot of what we do is to enable partnerships.. and my training only allows me to understand the environment and ecology, it doesn’t give me the skills with which to engage people to have the same understanding of the environment”.*

Yet others felt that:

“... the issue is not where the elephant move, what the elephant eat ... the issue was [is] how should SA manage and balance different societal needs in terms of ethics, policy, the environment ... the issue was[is] policy.”

“... [we] get pulled into some form of strategy planning ... run spatial data sets ... communicate findings ... needs the interpretation of science.”

The case of scientists as communicators of the case for biodiversity was raised quite prominently in relation to how science knowledge may be leveraged. The notion of

professionals trained in a multidisciplinary or trans-disciplinary manner echoes earlier research (DEAT, 2009a; DACST, 2000) (see chapter 5, table 5.1). The DEAT (2009a) ESSP research refers to skills mixes across the disciplinary divides of natural/biological sciences and social sciences, ecological-economic modelling and/or resource economics. This was a reflection of the complex skills requirements flowing from the legislative framework. An assessment of the extent to which these skill mixes are combined in a manner to form entirely new occupations needs to be conducted in order to determine the specific qualifications, experience and expertise that may be required in the field. The impact of technology was raised as a contributory reason for the range of skills now required. Thus, in conjunction with universities or other providers, the changing and new operational requirements need to be considered in relation to the specific types of qualification required.

This may even be done on a regional basis, as local needs may differ substantially from one another. For instance, the respondent who felt there was very little understanding of management of biodiversity in the urban setting rather than in the rural areas may require a very mix of skills.

If, in fact, many of these new types of skill mixes arose out of the changing operational requirements, it may indeed be unrealistic to expect recent graduates to meet these requirements, especially given the relative lack of specificity. The lag time between identifying the need, the curriculum design process, quality assurance by the Higher Education Quality Council, subsequent enrolment and completion of qualifications, implies that new graduates may not be ready to meet the growing need. However, it does appear that the quality of both the new and emerging multidisciplinary qualifications that are currently on offer, as well as discipline-specific qualifications, should be assessed. Both will still be in use for different reasons. For instance, an Environment & Earth Science degree with a social science component was rejected by one respondent as “*having no depth*”, only preparing the graduate for “*some public role*” and not a “*technical position*”.

The need for a range of skills mixes may complicate the supply process from higher education even more, as some of the new combinations may constitute entirely new occupations, amounting to absolute scarcity; that is, there is no appropriately qualified or experienced person either in the labour market or in the education and

training system. There are some examples of trans-disciplinary training being offered or in the process of development. One postgraduate example at the University of Stellenbosch is a “boundary crossing” PhD programme on social-ecological system sustainability, which aims to develop an “integrated understanding of both the material (e.g. institutional arrangements, economic concerns) and the non-material (e.g. the values, norms and beliefs of individuals and societal groups) determinants underlying sustainability challenges in Southern Africa” (2009) in 2010.

Respondents felt that more coordination and communication between the biodiversity sector and higher education was required to make courses relevant to burning issues in the sector including “the extinction of the species”, “human survival”, “climate change” and “degradation of the environment”. It was not immediately clear from the research that the interdisciplinary qualification should replace the (traditional) natural or life science postgraduate qualification. In fact, one respondent felt that *“it is quite correct to focus on natural science skills because that is where the biggest bottlenecks are”* and to *“become a nuanced ecologist takes years”*. The issue of what is required and what is not should be the subject of discussion between communities of experts (as envisaged in the QCTO under the NSDS – see Chapters 1 and 5) from practitioners within the sector, curriculum experts, higher education and the HEQC.

A risk that the sector may face is that, up to now, the supply of science postgraduates (and black postgraduates in particular) has not been sufficient to meet the existing technical skills needs, thus the current scarce skills challenge. The addition of a new range of biodiversity skills challenges, which is of a multidisciplinary nature, implies the creation of a higher order capacity need within an existing HE supply system that has very limited capacity. Thus, it is imperative to determine the relative size (number of new recruits) and the specific nature of the trans-disciplinary capacity need and determine at what level (undergraduate or postgraduate) it should be pitched. An evaluation of the Table Mountain Fund Capacity Building Programme (TMF-CBP) noted the difficulties in engaging tertiary institutions about the “lack of currency and relevance” of degree courses to workplaces (CAPE-WWF, 2007).

In creating systemic responsiveness in HE, the HCDS will have to respond to both its core need, the “hard” sciences, as well as the emerging multidisciplinary capacity need. An overview of potential skills needs arising from the legislative framework and other research is available in Chapter 5.

Another factor to consider is that the biodiversity-related study fields have been growing at a much faster pace than some of the additional fields it would like to draw on. Some have been in decline, including sociology, while others such as economics are in demand in the private sector and in government. Also, given the questions that have been raised about the general quality of first-year students in terms of their levels of literacy and numeracy, extending the scope of recruitment may be even more of a challenge. An interim alternative may be to consider developing specialised top-up courses for existing scientists, as they are probably more likely to be fully productive within a much shorter period than new graduates.

The nature and availability of bursaries

The literature shows that student study choices as well as the completion of their studies are influenced by funding and to some extent their bursary requirements. Even where first-year students do get bursaries, administrative inefficiency in getting the money to students is problematic. Thus, reflecting on the experiences of some BSc students, a respondent noted:

“There is an underestimation of the desperation of first years ... because bursaries take long to come.”

Thus, in terms of study choices, funding is clearly one of the determining factors, if not the only one. Respondents noted that students often ended up attending classes in biodiversity-related courses because the study fields were determined by the type of bursary, for instance provincial agriculture departments, local municipalities and so forth. In the evaluation of Grade 11s who had attended a Youth into Science camp, most enrolled in accountancy because they received bursaries from one of the sponsors, a chartered accounting association. However, in one case, a respondent noted that despite a bursary scheme for postgraduates they had not had a single application from black students.

Finally, the male-dominated (and often highly aggressive or competitive) cultures in higher education science faculties were cited as an obstacle to increasing the numbers of postgraduate students and women, specifically in the sector.

The changing “face” of the young graduate and entry-level employee

An emerging theme in the research was about the changing “face” or profile of the young science graduate emerging from higher education with an undergraduate degree (BTech or BSc) or a postgraduate degree (usually honours, and less often a masters or a doctoral degree). Firstly, at undergraduate level and honours level, there were more blacks (Africans) emerging from university, while there were still more whites and women emerging with a postgraduate degree at the master’s and doctoral level.

In the interviews, complaints were often raised that these young graduates have very different expectations about salary especially, as well as different work attitudes.

In the NGOs salaries have become an issue affecting retention, but mostly once staff started having families. However, what was not considered was that perhaps the “growing of the family” was now no longer specific to older employees, but young incoming (and especially black) graduates. Thus, one respondent, in trying to explain why graduates often left because of the lure of higher salaries, explained this as follows:

“... they come from a previously disadvantaged background ... they have big families to support ... they can’t study further, [because] they have pressures to become economically active.”

The University of the Witwatersrand runs a programme for students who are the first in their families to attain a HE qualification. This is largely because the university appreciates the expectations that rest on the financial benefits flowing from an HE qualification, and the stress that this places on students. Thus, unlike previous generations of young (predominantly white) students, today’s generation of black students does not enter university only responsible for their own survival nor the backing of a financially supportive family and generations of family members with higher education to provide advice and appropriate support. The provision of

enabling environments, including financial (bursaries) and experiential (work experience placements, internships) opportunities, “hand-picking” graduates and placing them in mentorship programmes were some of the recommendations.

It is inevitable that there will be “leakages” from these interventions, as some graduates and students will leave for other opportunities.

The apparent mobility of the younger generation and their changing attitudes to work is a global phenomenon, however, and not peculiar to South Africa. Research, locally and globally has shown that the portability of skills among knowledge workers, high technology professionals, and other professionals in the knowledge economy have meant that employers may no longer rely on long-term commitment by this layer of the labour force (Sutherland & Jordaan, 2004:55; Dockel, Basson & Coetzee, 2006). Globalisation has brought about what may be termed a cultural shift in the understanding of and attitude to the world of work, jobs and careers (Sutherland & Jordaan, 2004).

Thus, in the industrial economy, employees’ attitudes to work and employers were based on the largely hierarchical and Fordist conception of work: a “job for life” and long-term attachment to a permanent job, thus forming attachments and loyalties to particular organisations. The cultural redefinition of the meaning of the “new world of work has led to transitions in the employer–employee relationship over time” (Sutherland & Jordaan, 2004:56). The shift to information communication technology, increased automation and the dominance of financial capital has also meant a decline in the centrality of the worker (Dockel et al, 2006). Thus, international evidence suggests that, unlike the past, employees now may change jobs often and even careers over their life-span. This mobility is often facilitated by improved access to education, longer life expectancy and improved health. Further, there is evidence to suggest that the younger generation is not tied to the idea of having one job for life, as may have been the ideal for older generations. Thus, increased mobility among all, and younger employees in particular, is a general phenomenon and more a reflection of systemic change in attitudes to work rather than peculiar to particular groups.

In South Africa, considerations of these global changes are often shunned in favour of a focus on perceptions of the adverse effects of transformation and employment

equity. Yet, the overall outcome is the labelling of an entire generation of young graduates and entry-level employees. This approach may be counterproductive, as the sector attempts to compete against other sectors and occupations that are in fact able to offer a relatively better set of working conditions in the SET field. The next section on retention and development looks at the extent to which the sector is building an enabling environment to foster commitment among its existing staff.

CAREER PATHS, RETENTION AND STAFF DEVELOPMENT

The previous section focused almost exclusively on factors that affect the recruitment of suitably qualified entrants to the sectors. This has proven to be one of the most intractable challenges in the sector. In this section, the focus returns to those who are already in the biodiversity labour market and the factors that contribute to or detract from retention and career development.

Career paths for scientists and managers

The lack of career paths was consistently cited as a fundamental constraint in the retention of both new and experienced staff. In most cases, well-planned and transparent career options and development paths were non-existent, presenting limited opportunities for advancement. Both conservation managers and scientists felt that they had reached the institutional ceiling fairly quickly, causing frustration among senior managers. Some indicated that this was an area currently being investigated by their respective organisations.

“... you come in as a curator ..., you will die first, unless the senior curator dies before you. You come in and you stay on the same level. Until there is a vacancy.”

Other examples were cited as well, and even where there was some progression path, for instance at universities (lecturer, senior lecturer, associate professor, professor etc), the lack of demonstrable financial rewards often rendered advancement insignificant. Thus, many university lecturers engaged in consultancy work to supplement their salaries. For some, a compensatory factor was the relative freedom and autonomy to *“decide what interests you and focus on your field of interest”*.

Specific problems cited with regard to technical university staff included a lack of promotions unless their jobs were re-evaluated. An example of the suspension of such job re-evaluations was cited, as it suspended the opportunity for advancements. A lack of funding to sponsor possible promotions was cited as a more recent occurrence. The Centre for Scientific and Industrial Research (CSIR) was consistently quoted as having an extensive career pathing system and provided clear paths of progression.

The other constraint was that advancement was often associated with increased managerial loads, and not necessarily scientific output or productivity. At universities scientific productivity was the measure by which promotions were achieved. In other sectors, however, there was a view that there was no equivalent pathway for scientists, and seniority was often obtained by becoming managers.

“First, there is no career path in the science direction and you reach a ceiling. The only way to progress is to become a manager. Currently this is being looked into.”

An interesting related observation was about an apparent lack of organisational value placed on [scientific] knowledge as a consideration in career pathing. Thus as articulated by one respondent:

“... the current structures for salaries and stuff is all around managerial loads ... as a society I think we give very little recognition to knowledge skills, [we need to] create a recognition [of] knowledge’s worth and the difference it makes.”

This apparent displacement of tacit knowledge of individuals, as opposed to that invested in technology, bears some discussion in the sector. If this is in fact the case, it is rather paradoxical in a sector and economy that claims to be predominantly knowledge-driven.

The research suggests that there are more fundamental issues underpinning a discussion of career pathing, and that it is not just simply an HR issue. There appears to be fundamental differences in the interpretations of the “real” or appropriate role of scientists, given the changing context concerning public accountability, the value of science knowledge in a development context, and the role of individual scientists. Thus, there were differing views on the merits of the morphing of scientific knowledge into managerial work, strategic planning and

corporate communications. A very positive view was taken in terms of the value added by scientific knowledge at a strategic level:

"I think ways of integrating the knowledge systems that exist into decision-making need to be much more strongly explored."

This view was broadly supported in as far as there was a need for the sector to market and sell itself, a task that did not necessarily come naturally to many scientists. According to this view it was inevitable that scientists would take on more managerial functions. It was also felt that, as insiders, qualified scientists may actually understand the needs of fellow scientists and the scientific arena better than those coming from non scientific fields.

However, others felt that this form of public accountability resulted in a neglect of the real role of scientists, that is, to conduct research and publish journal articles. This opinion was expressed as follows:

"A lot of what we do is much more involved in strategy, and scientific services people often get pulled into some form of strategy planning."

"We play this role as advisory and end up doing very little science, I think that's a problem, we have a real need to do more basic research in our function."

This was often raised in relation to the role of scientists in the scientific services, a legislative requirement at provincial level. It appears that while scientific services (employing ecologists among others) were often the scientific backbone of provincial parks, they have suffered declines in numbers and experienced high rates of staff turnover with no solutions offered by leadership. Given the devolved nature of conservation in protected areas, insufficient equipment and updated technologies and skills were cited as major concerns.

In light of the controversial context within which biodiversity often occurs, for instance, elephant culling or the use of indigenous plants for pharmaceutical purposes, scientists may wish to shy away from unnecessary public and media attention.

What it does illustrate is that even though the social and legislative context means that scientists in the biodiversity sector can no longer stay in the "hide" forever, whether in the veld or the laboratory, there are differing interpretations as to what a

scientist is supposed to do. The fact that career advancement in the sector (especially outside of the HEIs) overwhelmingly seems to favour one interpretation over the other is perhaps counterproductive, as it gives experienced scientists an additional reason to leave.

It also means that it is not just the difficulties of transformation that have led to turnover, but the limited scope for advancement to meet the differing needs of professionals and managers.

However, some solutions were also offered. Thus, it was reported that a solution for dealing with public accountability was through the appointment of management liaison staff to reduce the administrative burden of scientists.

“... their job is to take what the scientists do and interpret it for managers and it gives the scientists more space to publish and to actually do their job.”

Frustration was also expressed about the administrative load of scientists, and the fact that they often do not engage in the field that they have studied for. This frustration was expressed very well by one respondent:

“Only the labourers in the nature reserve work in biodiversity.”

During the ESSP process, a scientist in a national government department expressed frustration over the fact that he was no longer using the scientific skills for which he was employed, as he had become like a “postman”, in doing submissions. He felt that his skill now lay in identifying the correct forms, their correct colour and the correct persons to pass them on to.

Thus, the lack of opportunity in terms of a greater variety of responsibilities and a sense of challenge in senior jobs, often meant moves into managerial posts that do not suit all personalities, and may contribute to turnover, as expressed below.

“... he hated bureaucracy, he hated meetings, he hated minutes, he hated budgets, he hated reports, he wanted to go back to [old job]. And those are the people we will lose to other organisations, just to do something different. Not every scientist is going to be a manager.”

“... it's a funny thing, conservation. The higher you go, the less you do what you love!!”

However, there was also a view that instead of considering managerial work as the only progression path, alternatives should be considered in providing older professionals with alternative, perhaps horizontal, pathways, which may include interesting projects that are challenging and multidisciplinary. The literature confirms the view that organisations needed to develop systems that provide “challenging work, career development opportunities ... [and] rewards based on individual performance” (Cappelli, 2000:63).

The fact that conservation managers “*had less status*” was raised as a concern by one respondent, who felt that this was the reason for high turnover among reserve managers. Contributory factors included the lack of authority accorded to reserve managers to do their work, the salary levels were not equivalent to comparable “sister” organisations, the flat career structure, as well as the inefficient allocation of support nature conservationists in the parks creating more stress for the reserve managers.

“The responsibility of the reserve manager does not change, so whether there is 5 people supporting you or one, your work is the same. It just means that you are now doing the work less effectively.”

Another who had moved on felt that working at a provincial nature reserve “*was an obstacle [to] growth ... if you got promoted there, it was quite a big thing, ... the opportunities for promotion were very small in that field ... need more levels to progress on*”.

Another who had also left a provincial reserve for local government because “*I was going to stay as a nature conservation officer forever ... been there for ten years ... there were no opportunities*”.

Given the widespread acknowledgment (at least in the literature) of the complex nature of the evolving responsibilities of the reserve manager, these sentiments indicate that there has not been a concomitant reallocation of resources to assist reserve managers, nor are they accorded the necessary status, advancement opportunities and rewards. Yet, all the indications are (in terms of DEAT expenditure and the MTSF priorities) that protected areas and trans-frontier areas and their management will remain extremely important in the development growth path of the economy. Thus, the HCDS may need to investigate the working circumstances and

incentive system for reserve managers a little further. A potential career path for reserve manager needs to be investigated. There were no suggestions forthcoming from the research, except that the current management-driven model may also be inappropriate. Appropriate forms of training for reserve managers may require consideration of short courses in “top-up” skills (suggested in chapter 5) as well as a customised postgraduate degree in the longer term in conjunction with relevant service providers.

The effect of salaries and salary parity

While most respondents agreed that their passion for the sector kept them there, frustration was also expressed about salaries:

“... retention is linked to finances, now it’s no longer job satisfaction, it’s about money, money counts.”

“... they need to retain staff by giving them what is recognised as a living wage.”

Highly differentiated pay scales across universities were thought to contribute to a loss of experienced lecturing staff. This, it was argued, was a continuation of historically unequal funding allocations among formerly black and white universities. Given that there were only two participating universities, the effect of salary and salary parity (lecturing staff in biodiversity) may be an area to investigate in line with the rest of sector.

Remuneration was an issue across all spheres of government. The issue of pay parity was of concern, and the implementation of the Occupational Pay Dispensation (OSD) for scientists was raised as one means to begin to address the issue. Further, the apparent lack of pay parity across local and provincial government also appeared to be a source of dissatisfaction. Thus, government scales apply to the provinces and national, but the metros set their own pay scales. These differences may also contribute to turnover.

The evidence suggests that salaries have become a factor in the retention of mid-career professionals and do not just apply to entry-level professionals. There were two key points in terms of the nature of the salary concern. Firstly, it had to do with certain points in the life-cycle of professionals. Thus, as employees grow older their

financial needs change, especially when they start bringing up a family, acquire a house (“the bond”) and so forth. In the NGO sector, whereas salary used not be a big issue, they found that as employees reached that point (bringing up a family) in their lives, they began to consider other options. Thus, this is a vulnerable period in the professional life cycle as employees consider resigning for better financial opportunities elsewhere.

The other factor may be called doing a comparative “market valuation”, in that experienced professionals (at university and in the sector) compare their salaries with those of their peers (who may not always be their peers in terms of qualifications and expertise) elsewhere. This was often about comparing their own skills mixes to those of others outside the sector, and the differences in rewards. This does not mean that a negative comparison will lead to resignation, but that a sense of dissatisfaction may prevail. It is in this regard that there was the perception that poaching within the sector was widespread and could be attributed to perceptions of a lack of salary parity. Thus, there appeared to be two key “pull” periods in terms of the turnover of experienced and mid-career professionals.

Finally, the expenditure on consultants by the DEAT (see Chapter 1) has created another labour market and may also add an incentive for experienced staff to resign and do consultancy work.

Mentorships, studentships, internships and supportive learning environments for new entrants were often cited as key to providing new graduates with the vocational experience to fit into the sector. However, the lack of funding to sustain such mentorships was raised as a problem in the NGOs especially, given the exclusive focus of funders on the conservation aspect of their work. This was despite, as was argued, the fact that environmental sustainability could not be attained without sustainable human resource capacity.

“Perhaps in the middle there is beginning to be a problem, because you don’t retain people successfully ... then you have a group of older people who are moving towards the end of their career ...”

The retention of older and more experienced staff was fundamental to recruiting new staff and providing them with an appropriate supportive learning environment. Thus, older and more experienced staff had to act as mentors to new entrants. However,

this was often in addition to their existing workload. Furthermore, senior scientists often resisted supporting such programmes as they felt that supporting students was not part of their jobs, or where they do support them, graduates were frustrated by the low key work they had to do. In addition, there were no incentives for senior staff to participate in such programmes, unlike university lecturers.

It was felt that vacancies were mostly for employment equity candidates. Given that experienced staff were mostly white, there was the perception that many had reached their career ceiling.

While there was an overwhelming perception that those from designated groups left mainly as a result of salaries, some argued that a lack of recognition, guidance and too much mentoring were often also reasons. This was contrary to the view that, in other instances, people left because of insufficient mentoring and the fact that they were often thrown in at the deep end. In government departments the latter was often the case, as senior scientists, who often were white had left, and a very thin layer of senior scientists were left to mentor, if at all. Thus it is necessary to attain a balance where young black scientists are provided with appropriate support, but are not in a state of perpetual development and training.

Staff development

Most respondents reported staff development programmes for experienced staff, although it was not always clear that such training was relevant. Often such interventions were at the request of individuals rather than linked to a career path. Funding for conference attendance had often been reduced. A review of training offered in the participating organisations also found that training of professionals has been declining where trends data were available. The DEAT budget confirmed the declining trend. It appears that, contrary to protestations about the difficulties in retention of professionals, expenditure patterns have not been adjusted in terms of training for existing staff. The promotion of accredited training programmes that are specific to the needs of the sector and implemented by a group of approved service providers may begin to address the apparent decline in specific training currently noticeable in training provision patterns presented in Chapter 5.

Retention and commitment

The literature (Chapter 1) suggests that addressing “unique and individual value systems” rather than focusing on “generic motivators” may be more useful in meeting the aspirations of knowledge workers and building commitment. The implication was that a generic approach to recruitment, talent management and so forth may not be the most effective manner to recruit or retain professionals and managers. Given the standardised approaches often adopted in the public sector (which dominates the biodiversity conservation sector), it is perhaps then not surprising that it reports high rates of turnover and difficulties in filling vacancies. Accordingly, to some, the establishment of the occupational salary dispensation (OSD) was an admission that there were particular difficulties in the retention strategy with regard to government professionals. The extent to which the HCDS may be able to deal with the retention issues in government departments may be limited. However, creative solutions for the rest of the sector that include career pathing that provides for advancement without necessarily shifting into managerial work; other development opportunities including appropriate training; funding for conference attendance; improved infrastructure and up-to-date technologies and equipment were all raised to deal with the problem of retention of experienced staff. With regard to the issue of outdated technology, even the newly appointed Minister of Science and Technology recently warned against the negative effect of “worn out laboratories, old machinery” on “disillusioned neglected scientists” (DST, 2009).

IMPLICATIONS

The fieldwork confirmed many of the key challenges found thus far in terms of the factors driving the demand and supply of skills; the dominance of whites and males in the sector; the changing “interdisciplinary” mix of skills required as a result of the legislative context; the lack of responsiveness from HE in adjusting qualifications to suit the new operational requirements; and the challenge of meeting employment equity targets given the small pool of black scientists with the requisite qualifications and experience.

However, it did add more nuanced dimensions to certain findings. Most respondents argued that it was important to have a “*passion*” for nature and conservation to enter

and stay in the sector. Many felt that the incoming generation may lack this quality, especially black people who may not see biodiversity as a viable or lucrative career. However, the fieldwork suggested that if interventions are arranged around four entry points, this may create an enabling environment for recruitment: during childhood; at school or university; through mentors or role models; and informal networks. Thus, it was possible to catch up and develop an affinity for biodiversity conservation later on in life, an element that was illustrated by the way black scientists ended up in the sector.

The HCDS may create an enabling environment that will facilitate the process of “making biodiversity visible” at each of these four entry points suggested here: building on existing nature awareness programmes, mainstreaming the relevance of science subjects at school level, the provision of funding for study purposes and/or work experience opportunities, as well as the increased use of formalised networks for information, career advice and so forth. The creation of deliberate opportunities needs to be aimed at levelling the playing field for all and to increasing access to opportunities for those who may not have direct access to informal networks.

In terms of the challenge of transformation, there emerged the profile of an “ideal-type” black candidate when considering filling entry-level posts. The combination of technical qualifications, often higher-level degrees, soft skills and work experience mean that qualification requirements were out of sync with the labour market where more managers and core professionals are increasingly being employed with lower level qualifications; in addition, the work experience requirement appears to be unrealistic. The sector has to consider whether this ideal-type profile is realistic and realisable, and that it may represent a barrier to entry. The small increase in postgraduates to the sector, despite an increase in supply, indicates that the sector is not competitive in relation to other sectors. A number of recommendations focused on support programmes such as mentorships, studentships and internships to facilitate the completion of higher degrees and the gaining on the work experience.

Another key area for development was collaboration with HE to shape curricula and course development to be more responsive and in line with the different skills mixes now required for conservation managers and professionals. There was a suggestion

that a uni-disciplinary focus in the training has to be combined with multidisciplinary types of courses in line with changing operational requirements.

The image and mainstreaming of biodiversity as a profession among the public, young people and black people needs to be addressed: recommendations include career guidance that is more relevant, reflecting the real-life circumstances of rangers, scientists and managers in the field; and the development of career and life histories of black and women role models. This might address the lack of professional images (as opposed to the “volunteer” image) among young people. The sector should also consider conducting research on the perceptions of young graduates and learners regarding the sector as a career choice and for development opportunities.

In terms of retention, it was confirmed that there was a perception of high turnover. Turnover was driven by a lack of career opportunities, advancement and career paths. The management-driven focus of current career paths was too one-sided as it did not accommodate those who wished to remain in research. The lack of recognition of “knowledge” skills as opposed to management skills was implicit in the current career path and paradoxical in a sector that is knowledge-driven, and that should be valuing the importance of science knowledge in a development context. Thus, the HCDS, in investigating viable and alternative career paths there, should also consider the underlying value system. The frustrations of reserve managers need to be addressed, given perceptions of not being valued, poorly rewarded and not having sufficient resources to carry out their work. Given the strategic nature of protected areas in the development path of the economy, solutions need to be found. Another contributor to turnover was the administrative burden and the lack of challenging work sometimes encountered in government. The role of scientists as effective communicators was raised often in terms of how to translate scientific knowledge into the public domain given the interface with social and developmental concerns and communities, landowners and politicians. The perception of working in a low salary environment was widespread particularly among those working in government. Improvements in salary and salary parity were key concerns to be addressed, especially for mid-career professionals and reserve managers.

There were reports of training and development programmes for professionals and managers, but these appeared to be unstructured, unevenly implemented and often non-existent. The continuing cuts to training budgets are a concern given the increased complexities and the mix of skills required from the scientific workforce.

The retention of older professionals and those in retirement or about to retire in a mentoring capacity was recommended, given the low capacity in the existing workforce. The NGOs felt that the funded secondment of senior scientists to them to act as mentors for junior scientists for set periods may be one way to fund student placements. In the local government sector, retired engineers (who are mostly white) have been invited back to floundering municipalities to assist with skills transfer to younger staff, among other tasks, under a programme facilitated by JIPSA and implemented by the DBSA. There has been a suggestion that a similar programme be considered for the continued involvement of retired scientists for the purposes of skills transfer, even if only for limited periods.

CONCLUSION

The fieldwork showed that there was a disjuncture between the skills mix required given the complexities of the biodiversity context, the need to replace experienced personnel and the skills that are available. Owing to the history of the sector, there are not enough experienced candidates and the expectation of ready-made candidates does not fit the reality. The supply data suggests that the sector may be uncompetitive, especially in terms of its recruitment of postgraduates relative to other sectors. Further, the declining economy implies that recruitment may become a secondary option, and that upgrading from within may have to become more of a focus in the short to medium term. Existing institutional efforts indicate that there is a realisation that skills development and a cumulative and developmental process will have to be the basis for, and in support of transformation in the sector.

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