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### INTRODUCTION

This FY 2008/09 Key Performance Indicator Report provides an overview of performance by the Technology Station Programme (TSP) implemented by Tshumisano Trust on behalf of the Department of Science and Technology (DST). The report covers five perspectives, namely Stakeholders, Financial, Organisational, Learning and Growth, and Human Resources and Transformation, as required by the DST in their SETI scorecard.

### The Key Performance Indicators

The Key Performance Indicators (KPIs) are the measurements of the goals set by Tshumisano in the Strategy in line with the support of NSI and the R&D strategy and other national SET initiatives toward the development of local industry, in particular SMEs, to enhance the quality of life of all South Africans. The Tshumisano strategy focuses on challenges faced by the country in the NSI, HR development and the innovation chasm. In order to achieve the goals, which are reflected under Smart Industry and Economic Value Added, Tshumisano realised that Human Resource Development and Institutional Learning and Development are components that need to be strengthened and supported by preparing infrastructure and human resources that will drive the effective transfer of technical know-how to the SA industry, in particular the key sectors identified as having the potential to contribute to the strengthening of the national economy.

Not only do the drivers of technology need to be equipped with skills, but the industry itself must be educated in the basic skills of technology transfer and innovation. The majority of SMEs lack both technical and non-technical skills and they cannot sustain themselves in a competitive environment. In this report, some of the initiatives undertaken by the Technology Stations to develop both TSP and industrial skills are highlighted.

The Technology Stations are working with the Department of Labour's SETAs to develop short courses that are more relevant to the industry. These components indicators are mentioned under Human Resources Development of the Tshumisano Strategy. The development of knowledge and skills within the SMEs has enabled them to implement most of the low-end and high-end technologies developed within the Technology Station Programme and has given them a broader understanding of the competitive environment and of the measures that will have to be taken if they wish to sustain themselves within the markets.

In its endeavour to achieve its set goals, Tshumisano realised that innovation is driven by four pillars, namely companies (large and small), framework conditions, such as government policies and regulations, technology institutions and universities.

### Interactions with other stakeholders

Interaction with GTZ has enabled Tshumisano to position itself within the national innovation system. Through using the effective tool called RALIS, developed by GTZ consultants, the Programme achieved success in the areas of technology development, potential niche identification, strong stakeholder relations and the identification of the barriers for entry to the market by the local industry (in particular small enterprises). This tool, supported by GTZ (German Technical Co-Operation) was designed to

- diagnose the strengths and weaknesses of various regional innovation systems;
- create opportunities for Technology Stations to engage directly with key players in the regional innovation system, such as SMEs, government agencies, government and the community;
- come up with a set of proposals for practical activities to strengthen the regional innovation system; and
- identify the opportunities and indigenous knowledge that can contribute to the regional innovation system.

This enabled the TSP to locate itself within the regional innovation systems, hence contributing toward some of the local economic development objectives of various provincial governments, especially the manufacturing sector, thus adding value to job creation and poverty alleviation initiatives.

### STAKEHOLDERS' PERSPECTIVE

#### Fulfilling the Trust Mandate

The mandate of Tshumisano is 'to strengthen mutual relationships between Universities of Technology/Universities and SMEs in economic sectors of national priority'.

The Trust ensured that there is optimum participation by the academic research staff of the universities, and that the knowledge that exists in those institutions is exploited to the benefit of the SMEs, hence the successful technology transfer to the local industry. Although there was a 26% decline in scientific capacity within the Technology Stations, the scientific results in terms of innovation and R&D are satisfactory. The success in the area of technology transfer is indicated by the number of potential products or processes that are making an impact in the local and export markets.

The Technology Stations managed to develop over 987 products and processes for SMEs and were also involved in about 90 R&D projects. In the FY 2007/08, the Technology Stations developed about 500 products that are being sold locally and internationally. This indicates a significant improvement. Some of the potential products developed and tested by the Technology Stations are covered in the Annual Report for the FY 2008/09.

The Technology Stations support SMEs in diversified sectors, ranging from agro-processing to chemicals, clothing and textile, the automotive industry and the tooling sector. Sectors such as the automotive, tooling and clothing and textiles sectors are significantly affected by the economic downturn. The effects of the downturn are evident if one considers the decline in the number of SMEs in the financial year under review, although the figures are not significant in relation to those for the FY 2007/08. Some of the SMEs in these sectors, mainly the automotive sector, lost contracts or were forced to limit supplies to the markets due to the low market demands, as a result of the global recession.

The Technology Stations are grouped into four clusters which are listed below with their respective host institutions:

#### 1. Agro-Chemical Cluster: Servicing SME's in the Chemicals and Agro-Processing Sectors

- Technology Station in Chemicals  
– Tshwane University Of Technology

- Technology Station in Chemicals  
– Mangosuthu University Of Technology
- Downstream Chemicals Technology Station  
– Nelson Mandela Metropolitan University
- Agri-Food Technology Station  
– Cape Peninsula University Of Technology
- Limpopo Agro-Food Technology Station  
– University Of Limpopo

#### 2. Primary Manufacturing: Servicing SME's in the Electronics and Metallurgy industry

- Metal Casting Technology Station  
– University of Johannesburg
- Technology Station in Electronics  
– Tshwane University Of Technology
- Technology Station in Materials and Processing Technology – Vaal University Of Technology

#### 3. Secondary Manufacturing: Servicing SME's in the Clothing and Textile and Automotive industry

- Automotive Components Technology Station  
– Nelson Mandela Metropolitan University of Technology
- Technology Station in Clothing and Textile  
– Cape Peninsula University Of Technology
- Technology Station in Reinforced and Moulded Plastics  
– Durban University Of Technology
- Product Development Technology Station  
– Central University Of Technology

#### 4. Tooling Cluster: Servicing SME's in the Tooling and Automotive Sectors.

- Institute of Advanced tooling  
– University Of Stellenbosch (Stellenbosch)
- Institute of Advanced tooling  
– Tshwane University Of Technology (Pretoria)
- Institute of Advanced tooling  
– Walter Sisulu University (East London)

Negotiations regarding the establishment of two additional Agro-Processing Technology Stations are still underway between the provincial Governments of the Northern Cape and Mpumalanga.

## KEY PERFORMANCE INDICATORS

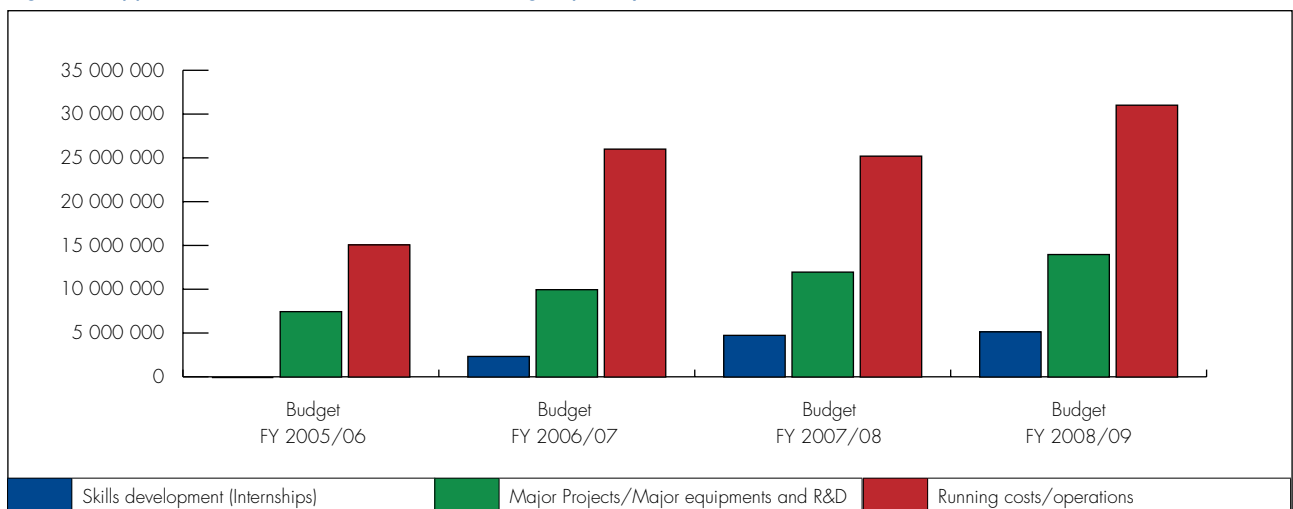
### Application of funding

The table below indicates how Tshumisano allocated its funding in the FY 2008/09 to ensure a successful Technology Transfer to SMEs.

Table 1: Allocation of funding according to priority

Priority Area	Budget FY 2005/06	Budget FY 2006/07	Budget FY 2007/08	Budget FY 2008/09	Key activity	Major outcome/ Impact
Skills Development (Internships)	R 133 000	R 3 500 000	R5 500 000	R6 600 000	Establishment of internships and including undergraduates and postgraduates in SMEs projects	Introduction of innovation and entrepreneurial skills to graduates  Development of Human Resources in Science Engineering and Technology
Major Projects/ Major Equipment and R&D	R 9 800 000	R 10 800 000	R13 000 000	R15 000 000	Purchasing the most effective and SME relevant equipment	Quality of SMEs products and effective production line
Operations/ Running costs	R 16 500 000	27 000 000	27 000 000	R32 000 000	Day to day operations of the Technology Station	Delivery of technology based services to SMEs and facilitation of university R&D initiatives

Figure 1: Applications of Tshumisano Trust according to priority



## KEY PERFORMANCE INDICATORS

### Support of NSI/R&D Strategy

Table 2:

National R&D Strategy	Tshumisano Strategy	Key Performance Indicators	Outcome/Impact
Expenditure /investment on R&D	Institutional learning and development <ul style="list-style-type: none"> <li>SME &amp; University related R&amp;D</li> </ul>	<ul style="list-style-type: none"> <li>The Technology Station programme's applied R&amp;D activities have increased, with potential products attracting the markets. About <b>57</b> R&amp;D projects were undertaken by the TSP and IATs, with the expenditure amounting to approximately <b>R 7,200,000</b> on R&amp;D by the TSP and IATs.</li> <li><b>Innovation:</b> An increase in innovations and the innovation capabilities of the Technology Stations is indicated by an increase in the number of successful products/ process that are making an impact in the market. About <b>987</b> products and processes were developed and improved by the TSP and the IATs, as compared with only <b>504</b> products improved and developed in the FY2007/08.</li> <li>Ther involvement of academic staff was due mainly to the <b>GTZ RALIS</b> initiative which considers academic staff involvement as an important part of technology transfer in the innovation system. Where the RALIS was conducted, academic involvement was at a high peak.</li> </ul>	<ul style="list-style-type: none"> <li>Due to successful applied R&amp;D, more than 30 SMEs secured contracts with both local and international markets, thus contributing to both job creation and poverty alleviation.</li> <li>The following are some of the potential SME products that are currently earning revenue in the market:                             <ul style="list-style-type: none"> <li>Talking Book (PDTs)</li> <li>Human Drawn Trolley (PDTs)</li> <li>GPS Housing (PDTs)</li> <li>Canopies for Nissan &amp; Toyota (IAT-WC &amp; R&amp;MP-DUT)</li> <li>Insect Repellent (DCTS-NMMU)</li> </ul> </li> <li>Postgraduate students and academic staff participated in SMEs R&amp;D projects. This enabled the academic institution to become involved in real industrial projects and contributed to the strengthening of the R&amp;D capacity of Universities of Technology through the knowledge transfer facilitation from universities to SMEs.</li> </ul>
Human Resource Development	Human Resource Development <ul style="list-style-type: none"> <li>DST/Tshumisano Internship Programme D</li> </ul> Institutional Learning and Development <ul style="list-style-type: none"> <li>All academic qualifications and short courses and 80% successfully completed (internal capacity building)</li> </ul> Human Resource Development <ul style="list-style-type: none"> <li>Interns becoming entrepreneurs within six month after training</li> </ul>	<ul style="list-style-type: none"> <li>TSP recruited a total of <b>136</b> interns of which <b>35%</b> are female, <b>65%</b> are male, and <b>74%</b> are PDIs.</li> <li><b>9%</b> of the interns were registered for postgraduate Master's studies. The Internship Programme offered experiential learning students an opportunity to obtain National Diplomas.</li> <li>About <b>2%</b> of interns started their own successful businesses.</li> <li>Interns became entrepreneurs after completing the Internship Programme.</li> </ul>	<ul style="list-style-type: none"> <li>Over 90% of the interns trained by the TSP in the previous years secured employment in the public and private sectors. <b>5%</b> of Interns left the programme before their contract lapsed due to absorption by industry.</li> <li>SMEs are satisfied with the contributions made by interns whose innovative inputs and knowledge of modern technology enhance their companies.</li> <li>Interns who opted to become entrepreneurs became effective entrepreneurs because of the knowledge they had gained and will be able to make significant contributions in the area of job creation in the future.</li> </ul>

## KEY PERFORMANCE INDICATORS

National R&D Strategy	Ishumisano Strategy	Key Performance Indicators	Outcome/Impact
<p><b>Human Resource Development</b></p>	<p><b>Institutional learning and development</b></p> <ul style="list-style-type: none"> <li>All academic qualifications and short courses and an 80% success rate (internal capacity building)</li> </ul> <p><b>Economic value added</b></p> <ul style="list-style-type: none"> <li>20% annual increase in number of products, processing or services in the economy</li> </ul>	<ul style="list-style-type: none"> <li>A total of 199 personnel involved in TSP and IAT activities hold, or are studying to obtain higher qualifications. Together they constitute the capacity that exist within the TSP and IATs.               <ul style="list-style-type: none"> <li>15% of staff members have PhD or D.Tech degrees.</li> <li>14% of staff members have Master's degrees</li> <li>22% of staff members have B-Tech or B. Sc degrees</li> <li>4% of staff members are enrolled for PhD or D.Tech studies</li> <li>13% of staff members are enrolled for Master's studies</li> <li>19% of students are enrolled for B-Tech/ B.Sc degrees</li> <li>6% of students have obtained B.Sc degrees</li> <li>8% of students have Master's degrees</li> </ul> </li> <li><b>Patent registration by the Technology Stations:</b> A total of nine patents were registered in the FY 2007/08 as compared to seven registered in the previous financial year.</li> <li><b>Publication:</b> The Technology Stations and IATs published about 9 journals and 11 non-journal publications</li> </ul>	<ul style="list-style-type: none"> <li>SMEs receive cost-efficient technology-based solutions and services that have improved their production, the quality of their products, and their competitiveness</li> <li>Technology Stations and IATs are able to present a greater portfolio of technology-based solutions, products, and services to industry</li> <li>Students accelerate their absorptive capacity into industry within SMEs and greater industry</li> <li>Most of the products developed are highly innovative, hence they enabled SMEs to earn and retain contracts with big industries.</li> <li>Patents registered are already making an impact in the markets</li> <li>Contributed mainly to knowledge and skills within the Technology Stations</li> </ul>
<p><b>R &amp; D and Product / Processes Development Outputs</b></p> <p><b>Smart Industry</b></p> <ul style="list-style-type: none"> <li>At least 100 SME products were tested or developed per Technology Station per year as from 2007 to the end of 2009</li> </ul>	<p><b>Institutional Learning and Development</b></p> <ul style="list-style-type: none"> <li>University R&amp;D projects and SME-related project outputs</li> </ul>	<ul style="list-style-type: none"> <li>Total number of R&amp;D projects in the FY 2008/09 is 90, as compared to 86 in the FY 2007/08. Some of the sectors suffered because of the global economic downturn.</li> <li>The total number of improved products/processes in the previous financial year was 987. Most of these products are being exported and others are popular in the local markets.</li> <li>Only 9 patents were registered during the FY 2007/08 and about 4 patent registrations are still pending.</li> <li><b>Publications:</b> The Technology Station published about 9 journals and 11 non-journals in the FY 2007/08, giving a total of about 20 publications.</li> </ul>	<ul style="list-style-type: none"> <li>Improved learning and Teaching within the academic institution curriculum, especially in SET as students participate in industrial projects. About 116 students registered in the academic institution participated in the Technology Station and IATs technical activities.</li> <li>Courses based on industry demand were developed and are currently being developed by the Technology Stations with the help of universities and the Department of Labour's SETAs. More than eight courses were developed, which included at least one postgraduate (Honours) course. in Formulations Science were developed by the DCTS-NMMU and NMMU.</li> <li>Assisted with measuring the current capacity that exists within the TSP.</li> </ul>

## KEY PERFORMANCE INDICATORS

National R&D Strategy	Ishumisano Strategy	Key Performance Indicators	Outcome/Impact
Fragmentation	<p>Economic value added</p> <ul style="list-style-type: none"> <li>Collaboration with stakeholders/agencies</li> </ul>	<p>Tshumisano Technology Stations and IATs collaborated with the following stakeholders:</p> <p><b>Local stakeholders/partners collaborated with TSP and IAT to find technology solutions to SMEs:</b> AMITS, CSIR, Aluminum Federation of South Africa, NFTN – CPF, MINITEK, F'SATIE, Wesgro</p> <p><b>International stakeholders/partners collaborated with TSP and IAT for Technology Solutions to SMEs:</b> Braunschweig-Wolfenbuettel University of Applied Sciences (Germany), Ingolstadt University of Applied Sciences (Netherlands), University of Groningen Netherlands, University of Plymouth (United Kingdom), University of Stuttgart (Germany), University of South Carolina (America), FaME38 Facility at the ESRF-ILL (UK), University of Michigan (USA), University of Lund (UK), University of Koblenz Landau (Germany), IPC(USA), Federal University of Rio de Janeiro (Brazil), NSIC (India), SABRE (Brazil)</p>	<ul style="list-style-type: none"> <li>Contribution to the Regional Economic initiatives by the provincial government</li> <li>Reaching out to the poor communities, especially in the rural areas, job creation and poverty alleviation</li> <li>Beneficiation of regional natural resources through provincial strategies to contribute to economic development</li> <li>Skills and technology transfer from institutions in developed countries</li> <li>Market networks and stimulation of export opportunities</li> <li>Capacity building within the Technology Stations and IAT</li> </ul>
Fragmentation	<p>Economic value added</p> <ul style="list-style-type: none"> <li>Collaboration with stakeholders/agencies</li> </ul>	<p><b>Local stakeholders/partners collaborated with TSP and IAT to obtain funding for SME Technology Services:</b> Western Cape Provincial Government, SEDTA, IDC, SPI, Limpopo Provincial Government, IUBSA, DTI, KZN Department of Agriculture,</p>	<ul style="list-style-type: none"> <li>Provision of additional funding for industrial development, in particular SMEs</li> </ul>
Impact on other NSI or National Priority	<p>Economic Value Add</p> <ul style="list-style-type: none"> <li>One project implemented in collaboration with at least one stakeholder and/or agency</li> </ul>	<p><b>Foundry industry development:</b> Career Path Framework Development for the foundry industry with SAIF, GTZ, DoL, DoE and MCTS</p> <p><b>The National Fuels Chemicals Centre:</b> The purpose of the FCC is to provide a comprehensive fuel and fuel product analysis and testing capability to support training, R&amp;D and technical development of new and existing products comprising all major types of fuel and related fuel products</p>	<ul style="list-style-type: none"> <li>Foundry industry development in South Africa</li> <li>Fuel and fuel product analysis and testing capability</li> </ul>

## KEY PERFORMANCE INDICATORS

### Ensuring the quality of decision making

Table 3:

Policy recommendation	Expected Impact	Performance FY 2008/09
Improving cost recovery from projects and enforcing fiscal discipline measures at Technology Stations.	Station sustainability ideal in the absence of government funding will be enhanced.	The Technology Stations and IAT's recovered reasonable amounts from projects. The money was used to establish Technology Platforms, and for Human Resource Development.
Formulate a new, comprehensive and all encompassing Grant Agreement template for Technology Stations and Institutes for Advanced Tooling.	Organisational uniformity in terms of reporting, policies, IP issues, branding, equipment purchasing guidelines and consulting remuneration for experts and consultants employed by Technology Stations and the IATs.	Effective operational and financial management, and adherence to the conditions of the Grant Agreements by the Technology Stations/IAT's and their respective universities.
Re-orientation towards a skills development and Technology transfer mix.	Students, specifically black and female students, would gain valuable experience required for long-term employment and entrepreneurial know-how.	Technology Stations/IATs managed to train enough young blacks and females in the SET.
Requesting Technology Stations to submit their Business and Operational Plans to the Trust at the beginning of every financial year.	Ensuring the effective financial management and approval of their Business Plans and oversight of their operations by the Trust.	Technology Stations/IATs ensured that Tshumisano fulfils its mandate.
Requesting Technology Stations to submit their Narrative and Financial Reports and Quarterly Operational Plans to the Trust at the end of every Quarter.	Ensuring the effective support and management of Technology Stations, as well as the effective monitoring and evaluation of TSP and the IATs.	Effective monitoring and quarterly evaluation of the Technology Stations and IAT.

## FINANCIAL PERSPECTIVE

Table 4: Income for the FY 2008/09

Source of income	Total Income FY 2007/08	Deferred Funds FY 2007/08	Previous Year FY 2008/09	Current Year FY 2009/10
1. DST Grant(Parliamentary Grant)	54 382 578	16 384 085	50 100 000	50 194 000
TSP	36 000 000	10 692 939	36 000 000	36 000 000
Project Specific - Limpopo Start-up Capital	2 402 000	-	-	-
IAT	9 648 793	5 491 146	7 500 000	7 500 000
Indo-German Tool Room	331 785	-	-	-
Internship Programme	6 000 000	200 000	6 600 000	6 694 000
2. Project-related External Funding - Local	889 506	1 912 272	-	-
Limpopo Provincial Government	889 506	-	-	1 400 000
SEDA	-	1 912 272	-	-
3. Project-related External Funding - International	5 250 300	-	4 000 000	8 975 850
GTZ	3 200 000	-	4 000 000	8 975 850
4. External income to Technology Stations	2 050 300	5 144 103	-	-
<b>TOTAL</b>	<b>60 522 384</b>	<b>23 440 460</b>	<b>54 100 000</b>	<b>60 569 850</b>

- The Total income accruing to TSP and IATs, including all external contributions in the FY 2008/09, amounts to R 54 100 000.
- Tshumisano Trust receives most of its funding from the Department of Science and Technology which, as its main funder, has contributed 90% of the total income (see Figure 33) In the year under review, Tshumisano Trust also received project funding from other stakeholders, namely GTZ and the Limpopo Provincial Government.
- GTZ funding is not directly transferred to the Tshumisano account, but is added up in monetary value as skills development support to TSP.

## KEY PERFORMANCE INDICATORS

Figure 2: Percentage income to Tshumisano in the FY 2008/09

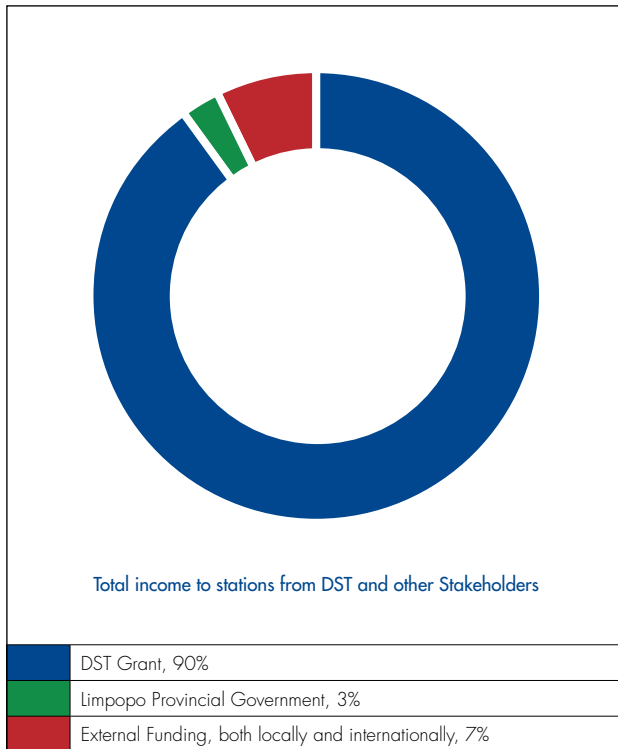
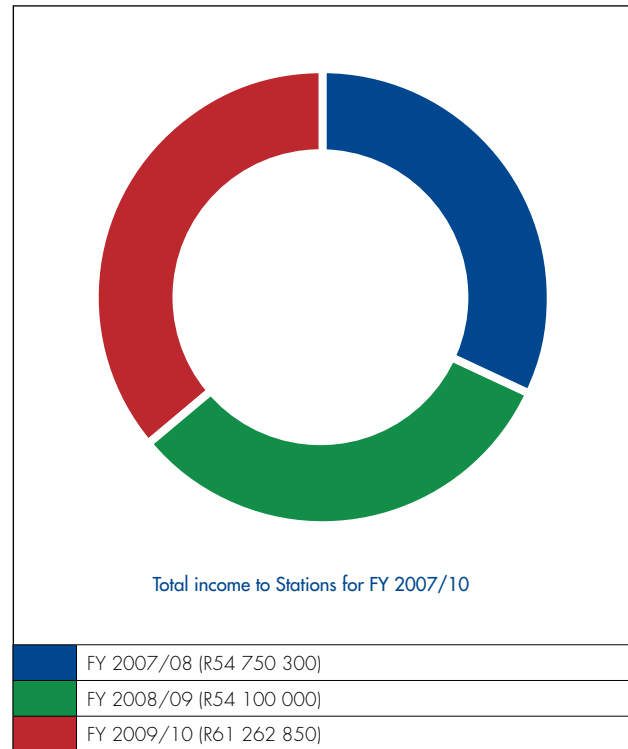


Figure 3: Total income received by Tshumisano in the financial years leading up to 2009/2010



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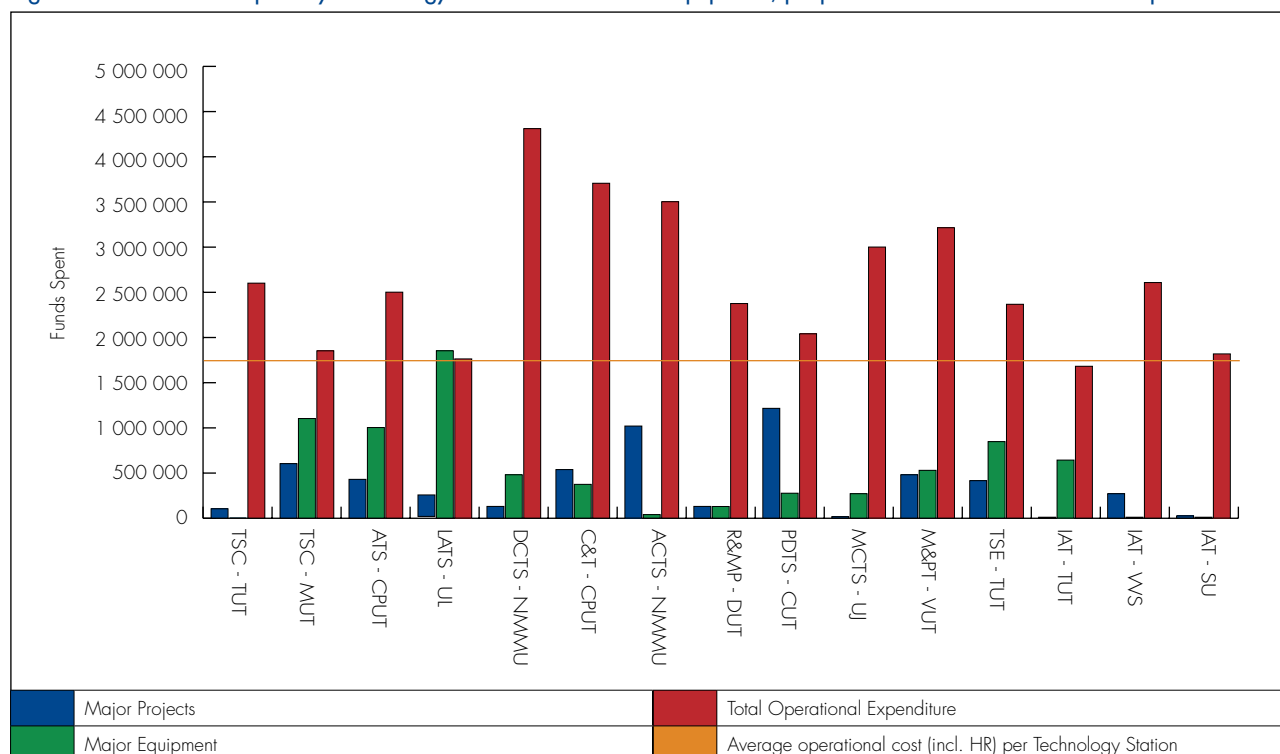
Funding was received from the Limpopo Provincial Government for SME and Technology Station infrastructure development in line with the provincial economic development initiatives, as outlined in the MOA and project proposal signed between Tshumisano and the Limpopo Provincial Government.

Table 5: Technology Stations' expenditure on major projects, major equipment, running/operational costs

Technology Station	Major projects	Major equipment	Running/operational costs	Total expenditure
TSC-TUT	55,000	0	R 1,620,000.00	2,629,689
TSC-MUT	622,408	1,079,095	R 1,500,000.00	1,875,954
ATS-CPUT	435,000	967,297	R 1,800,000.00	2,517,639
LATS-UJ	281,284	1,868,109	R 1,500,000.00	1,777,759
DCTS-NMMU	135,833	481,253	R 1,800,000.00	4,308,480
C&T-CPUT	551,842	384,816	R 2,000,000.00	3,700,312
ACTS-NMMU	1,046,945	80,000	R 2,000,000.00	3,506,401
R&MP-DUT	152,916	152,788	R 1,900,000.00	2,379,449
PDTS-CUT	1,234,787	287,483	R 1,900,000.00	2,045,088
MCTS-UJ	0	276,176	R 1,600,000.00	2,994,787
M&PTVUT	521,034	550,415	R 1,700,000.00	3,216,414
TSE-TUT	429,427	879,009	R 1,780,000.00	2,375,709
IAT-TUT	-	650,768	R 2,358,248.00	1,684,497
IAT-VS	291,298	0	R 2,255,177.00	2,601,733
IAT-SU	41,375	0	R 2,438,597.00	1,823,179
<b>TOTAL</b>	<b>5,799,149</b>	<b>7,657,209</b>	<b>R 28,152,022.00</b>	<b>29,612,951</b>

## KEY PERFORMANCE INDICATORS

Figure 4: Total amounts spent by Technology Stations and IATs on equipment, projects and human resource development.



## ORGANISATIONAL PERSPECTIVE

Table 6:

Key result area/Critical objective	KPI
Overhead efficiency	<ul style="list-style-type: none"> <li>Ratio of overhead cost to current total cost within the TSP: <b>2:1</b></li> <li>Salaries to total expenditure (Technology Station Programme and IATs) - variable depends on volume of special projects for the year: <b>3:1</b></li> <li>Ratio of Human Resource cost to Total Expenditure: <b>3:1</b></li> <li>Total Cost to Consultants to Total Expenditure: <b>6:1</b></li> <li>Ratio of Total Major Equipment costs to Total Expenditure at Technology Stations: <b>6:1</b></li> <li>Ratio of Total Major Projects cost to Total Expenditure: <b>7:1</b></li> <li>Proportion of researchers to total staff (Technology Station Programme and IAT's): <b>3:1</b></li> </ul>
Best practices	<p><b>Quality Management Process (QMS)</b></p> <p>Tshumisano successfully implemented a Quality Management System (QMS), particularly in implementing the core business area that includes the support and the management of Technology Stations and the Institutes for Advanced Tooling. QMS contributed significantly towards integrating various internal processes within the organisation and provided a process approach for the effective implementation of TSP and the IATs. Furthermore, QMS enabled Tshumisano to identify, measure, control and improve various core business processes that ultimately led to improved business performance.</p>
Best practices (cont.)	<ul style="list-style-type: none"> <li><b>Quarterly monitoring and evaluation:</b> Tshumisano performs a Monitoring and Evaluation process by focusing on the efficiency, effectiveness and the impact of the TSP and IATs. The process enables Tshumisano to monitor and review progress at Stations, and to identify challenges faced by the Technology Stations/IAT's and to offer support and advisory services. Its core focus is on internship, projects, equipment and human resources, as well as interviewing some of the SMEs assisted by the Technology Station and the Institute for Advanced Tooling.</li> <li><b>Annual one-on-one visits:</b> Tshumisano Trust undertakes one-on-one visits to Technology Stations and IATs during which individual Station's Business Plans are assessed and a financial year budget is approved, based on the proposed activities for the year and the previous differential year performances. Technology Station activities that are expected to achieve targets set by the Tshumisano Strategy are discussed in this session.</li> <li><b>Technical Advisory Forum:</b> The TA Forum serves as a platform for Technology Stations and IATs to meet and discuss operational and technical issues.</li> <li><b>Exhibitions:</b> Through Tshumisano's participation in exhibitions such as Export Africa and DST Insite exhibitions, opportunities were made available to SMEs, supported by the TSP, to showcase their innovative and quality products and to create networks with local and international markets.</li> <li><b>Cross-learning Workshop:</b> Technology Stations share ideas on the management of the Technology Stations.</li> </ul>

LEARNING AND GROWTH PERSPECTIVE

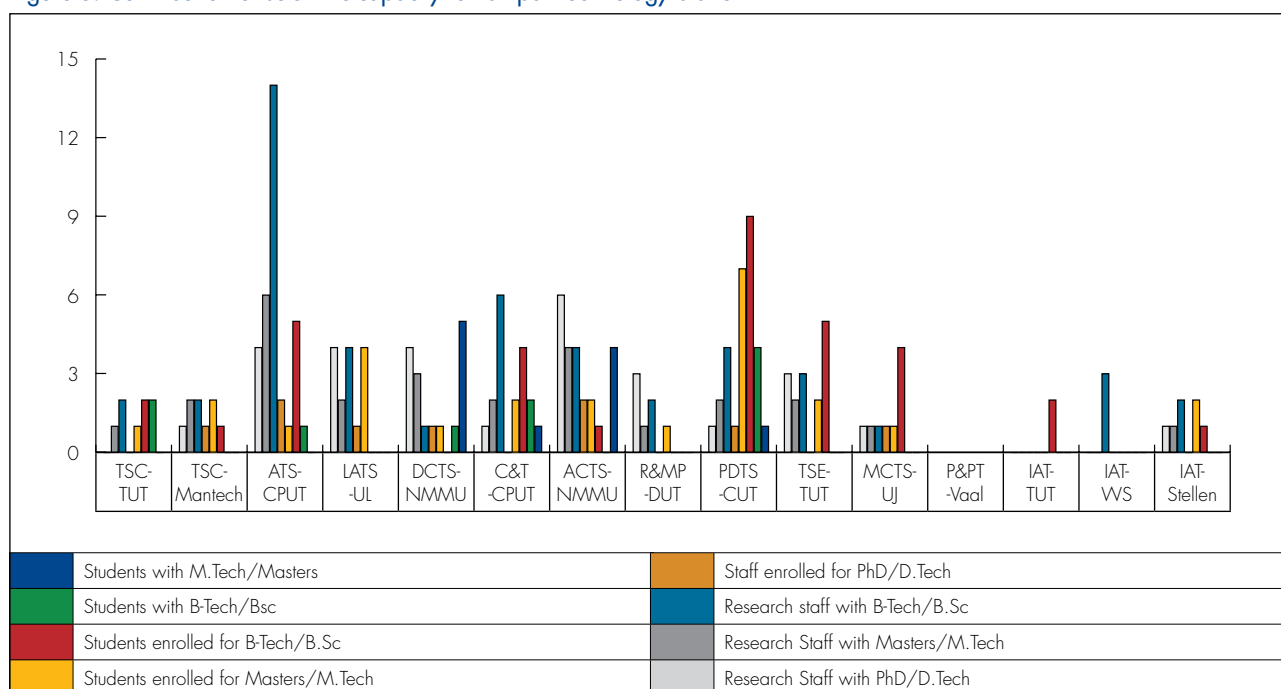
1. TSP scientific capacity, scientific output and capacity of Technology Stations vs. R&D output

Table 7: Overall TSP capacity

Staff qualification	Number FY 2007/08	Number FY 2009/08
Research staff with PhD/D.Tech degrees	38	29
Research Staff with Master's/M.Tech degrees	37	27
Research Staff with B-Tech/B.Sc degrees	34	45
Staff enrolled for PhD/D.Tech degrees	25	9
Students enrolled for Master's/M.Tech degrees	39	26
Students enrolled for B-Tech/B.Sc.	40	37
Students with B-Tech/B.Sc degrees	41	11
Students with M.Tech/Master's degrees	15	15
<b>Total</b>	<b>269</b>	<b>199</b>

The table alongside indicates the total overall capacity that exists within the TSP. The capacity includes the university staff and Technology Station staff involved in the Technology Station's technical activities. The table also indicates a decrease of approximately 29% in the capacity utilised by the Technology Station in the FY 2008/09 as compared to the FY 2007/08. The decrease was affected significantly by the decline in involvement of academic staff with PhD and Master's degrees in Technology Station activities, which did not have an effect on R&D within the Technology Station programme in the FY 2008/09.

Figure 5: Contribution of scientific capacity to TSP per Technology Station



The above figure indicates the contribution to the total scientific capacity within the Technology Station programme. Some of the sectors that are serviced by the Technology Station have been significantly affected by the economic downturn. This has resulted in some companies closing down, cutting some of their business units, retrenchments, and the loss of contracts with sectors affected by the economic situation. This brought about a decrease in market demand, which in turn led to reduced interactions between SMEs and Stations in terms of their products or process development.

DST/The Tshumisano Internship Programme

Taking into consideration the Human Resources weakness of the South African National System of Innovation, the DST/Tshumisano Internship Programme is guided mainly by the NSI requirements and the objective of this programme is to drive successful human resource development that will contribute to science, engineering and technology.

## KEY PERFORMANCE INDICATORS

In the FY 2005/06, 46 interns were trained through the programme. During the FY 2006/07 this number increased to 87, and then to 176 in the FY2007/08. In the FY 2008/09, 136 interns participated in the programme.

The total number of interns assisted by the programme since its inception in 2005 is 445.

The majority of the interns are offered employment even before their internship contracts lapse. Because of this fast absorption of interns by industry, the actual number of interns is higher than the number targeted.

Figure 6: DST/Tshumisano Internship Trend

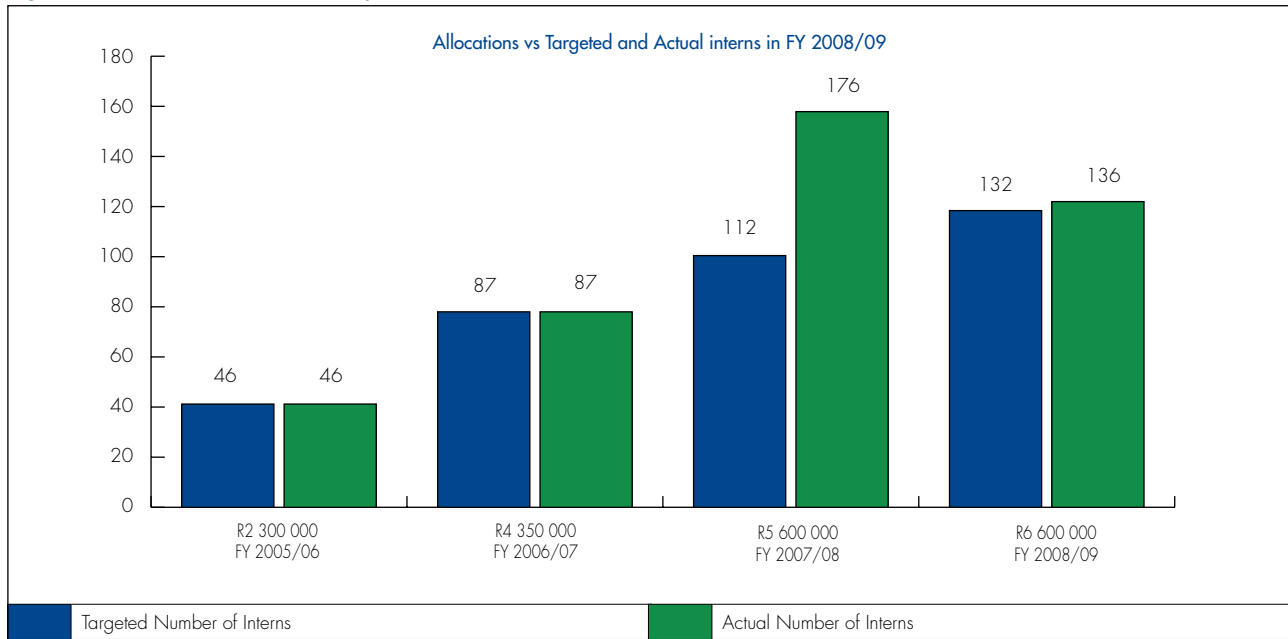


Figure 7: TSP Cluster competency areas developed in the FY 2008/09 in 136 interns

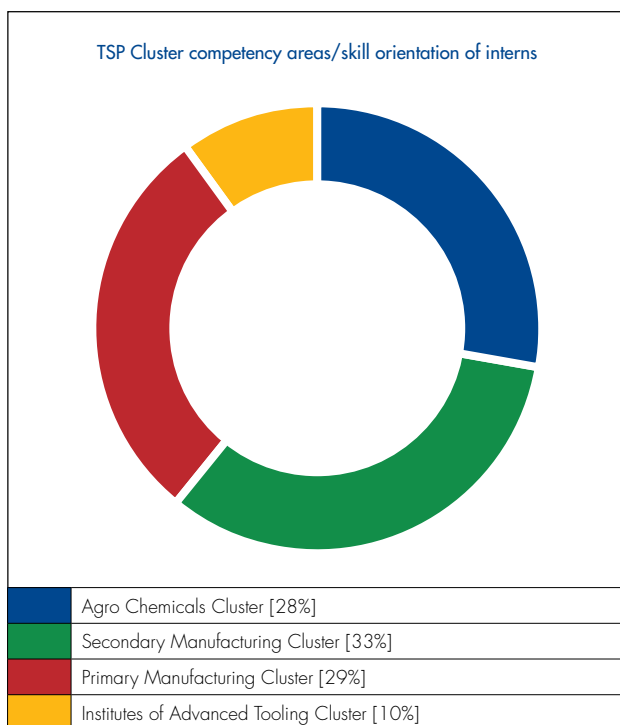
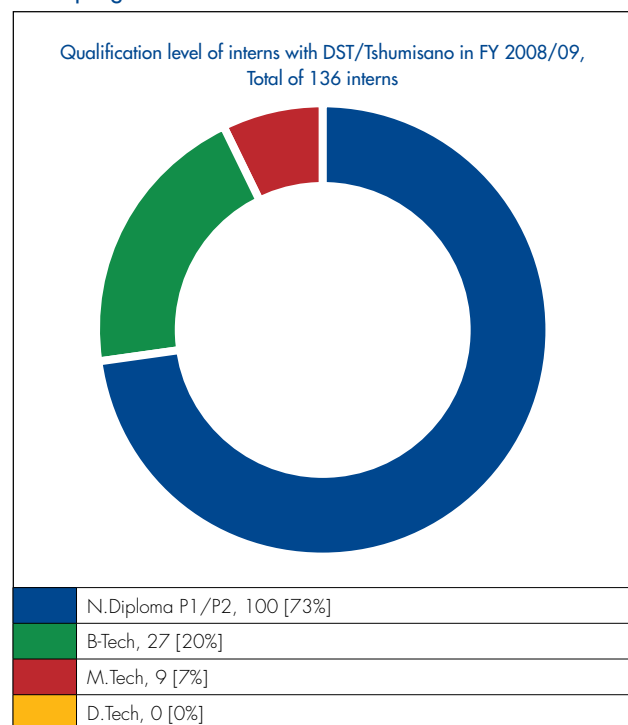


Figure 8: Qualification percentage of interns that participated in the programme in the FY 2008/09

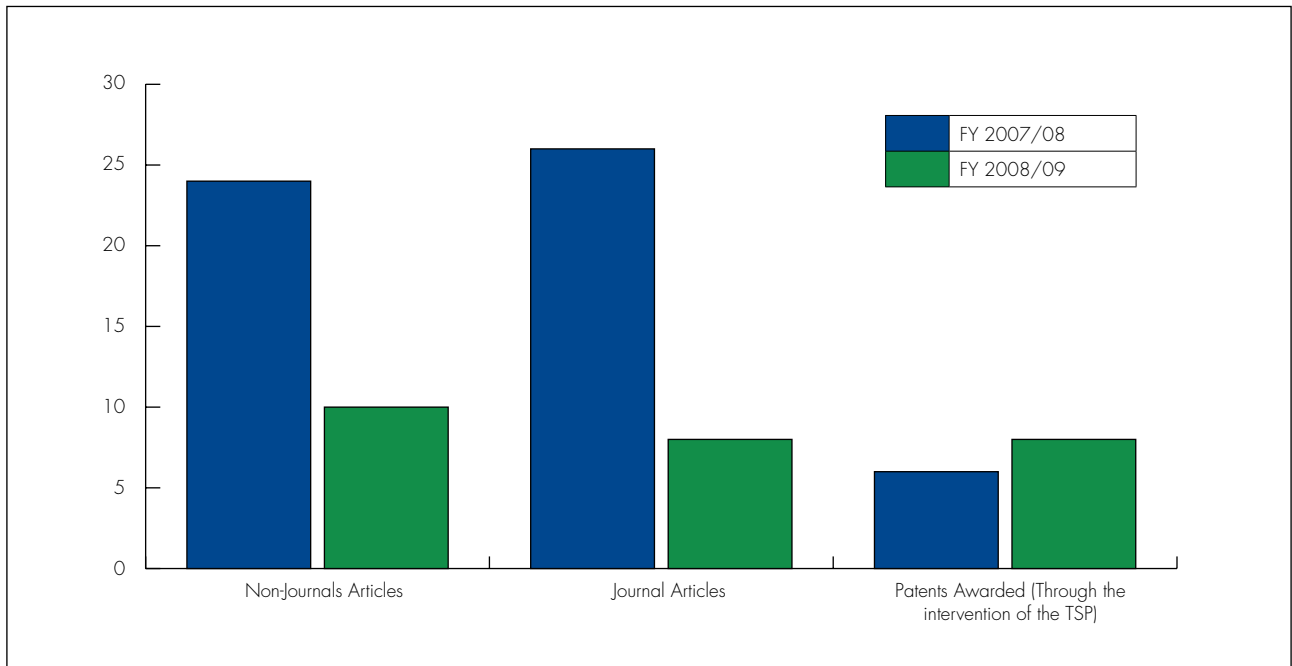


## Scientific output

### Publications and patents

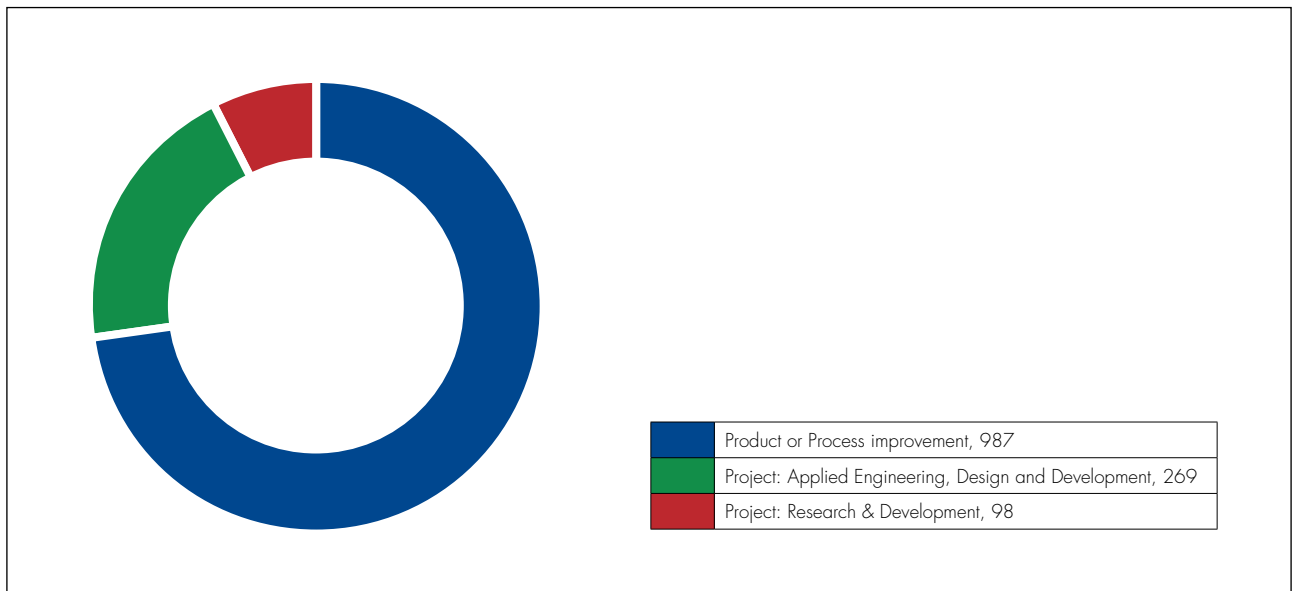
The decrease in the number of publication during the year under review reflects the decreased participation of the University academic staff in Technology Station activities. The Technology Stations managed to register nine patents, which is slightly higher than the figures in FY 2006/07 and FY 2007/08, with only eight and six patents registered respectively. In the FY 2008/09, the TSP registered 23 patents which are actively attracting both national and international markets.

Figure 9: Non-journals, journals and patent outputs in the previous financial years



### R&D and innovation

Figure 10: The number of Product and Process development Projects, Applied Engineering, Design and Development and R&D Projects. Total expenditure on these projects is approximately R 10 million, including external funding:



## KEY PERFORMANCE INDICATORS

Figure 11: Trend in the increase in R&D projects in the previous financial years. The decrease in scientific capacity did not have an effect on R&D and Technical activities

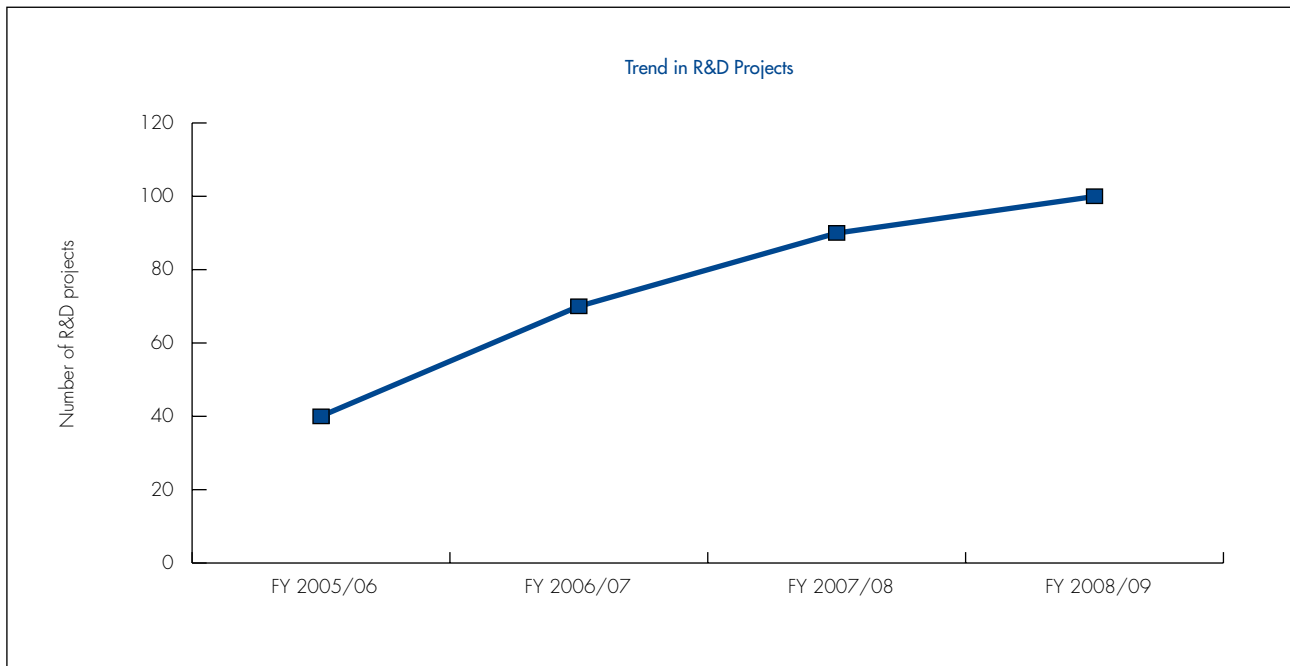
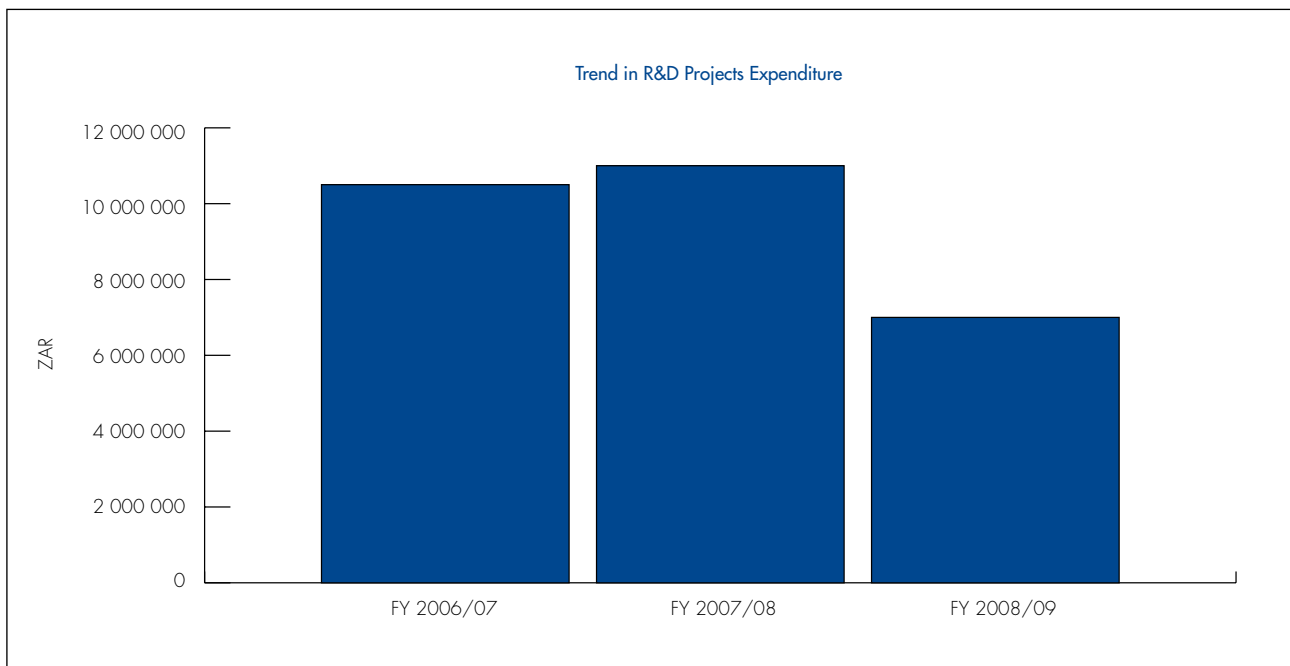
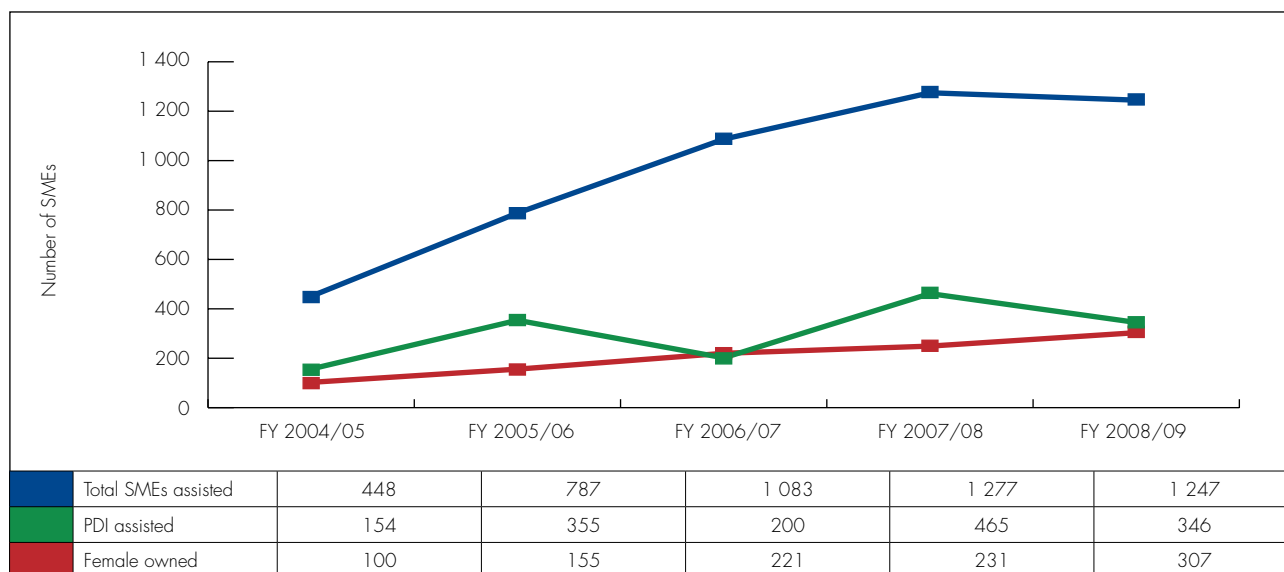


Figure 12: R&D Expenditure in the FY 2008/09



## KEY PERFORMANCE INDICATORS

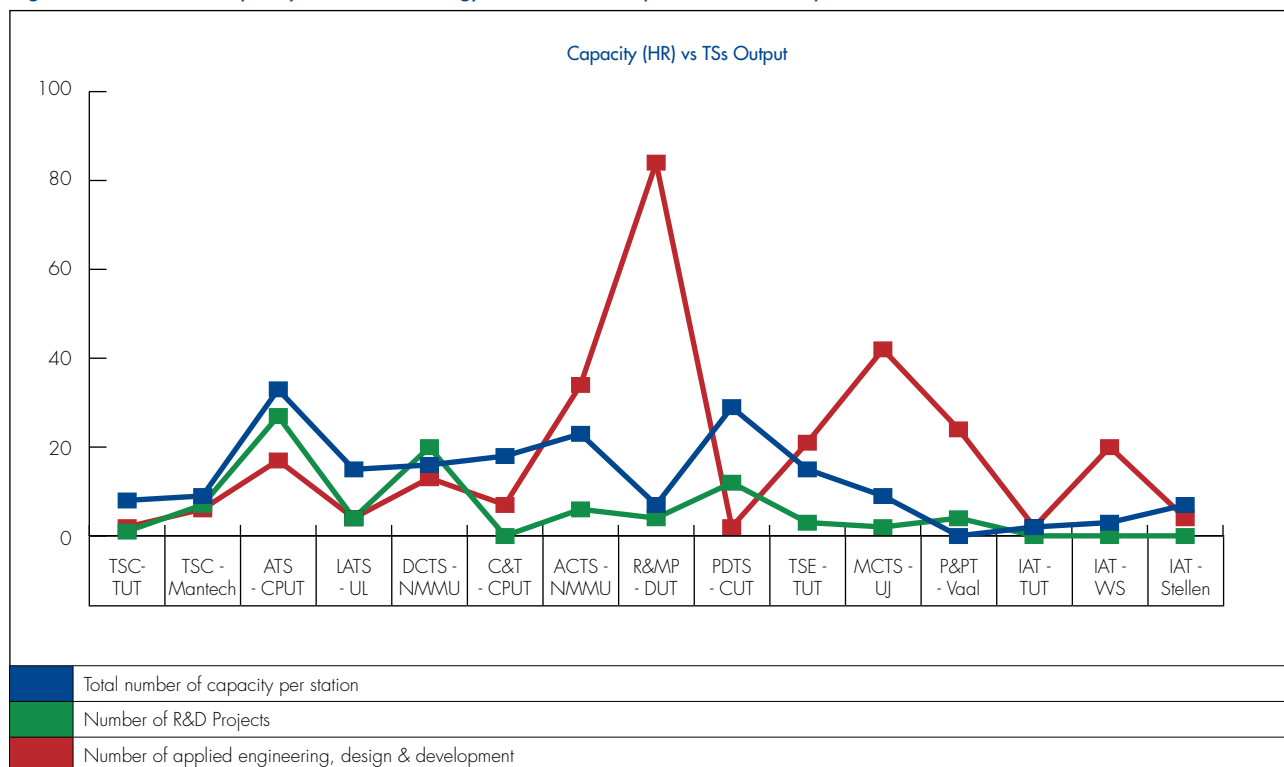
Figure 13: Trends in SMEs assisted



Even though the total number of clients that were assisted in the FY 2008/09 declined, the number of female owned SMEs increased in recent financial years.

## Capacity of Technology Stations vs. R&D output

Figure 14: Scientific capacity at the Technology Stations vs. Project activities/outputs



The above figure indicates the scientific capacity (B-Tech to PhD) at Technology Stations and the output in the FY 2008/09. The more the Technology Stations are capacitated, the higher the Technical activities, including R&D, that are taking place within the Technology Stations.

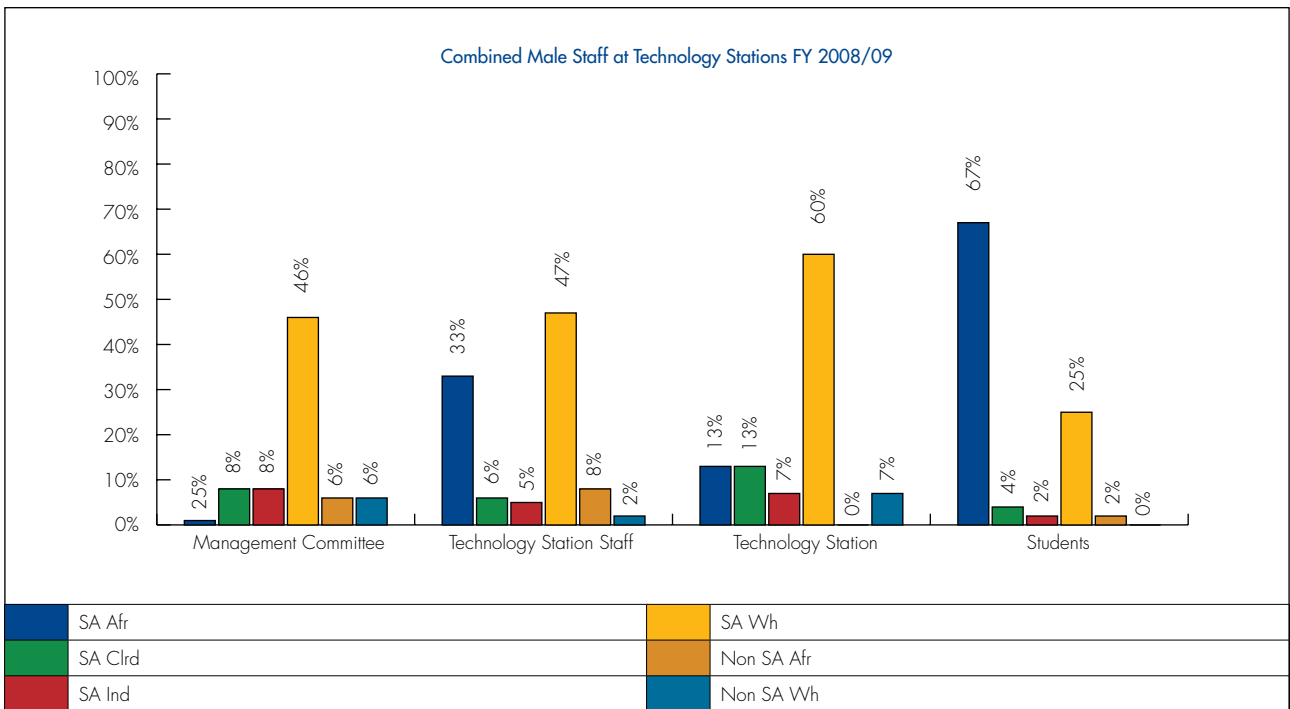
HUMAN RESOURCE AND TRANSFORMATION PERSPECTIVE

1. Demographics at the Technology Stations

Table 8: Combined staff at Technology Stations FY 2008/09

Combined staff at Technology Stations FY 2008/09														
MALE							FEMALE							
	SA Afr	SA Clrd	SA Ind	SA Wh	Non SA Afr	Non SA Wh		SA Afr	SA Clrd	SA Ind	SA Wh	Non SA Afr	Non SA Wh	Total Males + Females
Management Committee	16	5	5	29	4	4	Management Committee	3	1	1	11	1		80
Technology Station staff	21	4	3	30	5	1	Technology Station staff	23	4	2	6		2	101
Technology Station managers	2	2	1	9		1	Technology Station managers	1						16
Students	54	3	2	20	2		Students	32			1	2		116

Figure 15: Breakdown of the demographics at Technology Stations/IAT's FY 2008/09 (males only)



## KEY PERFORMANCE INDICATORS

Figure 16: Breakdown of the demographics at Technology Stations/IATs FY 2008/09 (females only)

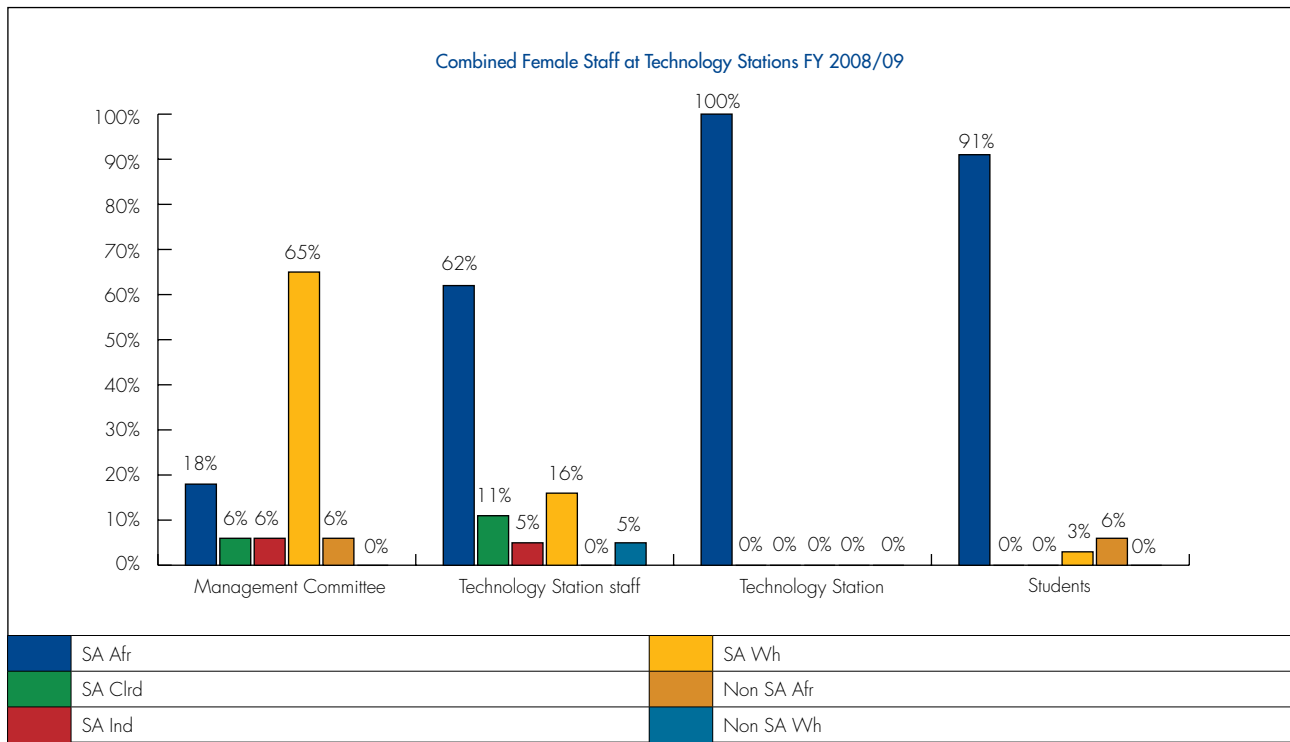
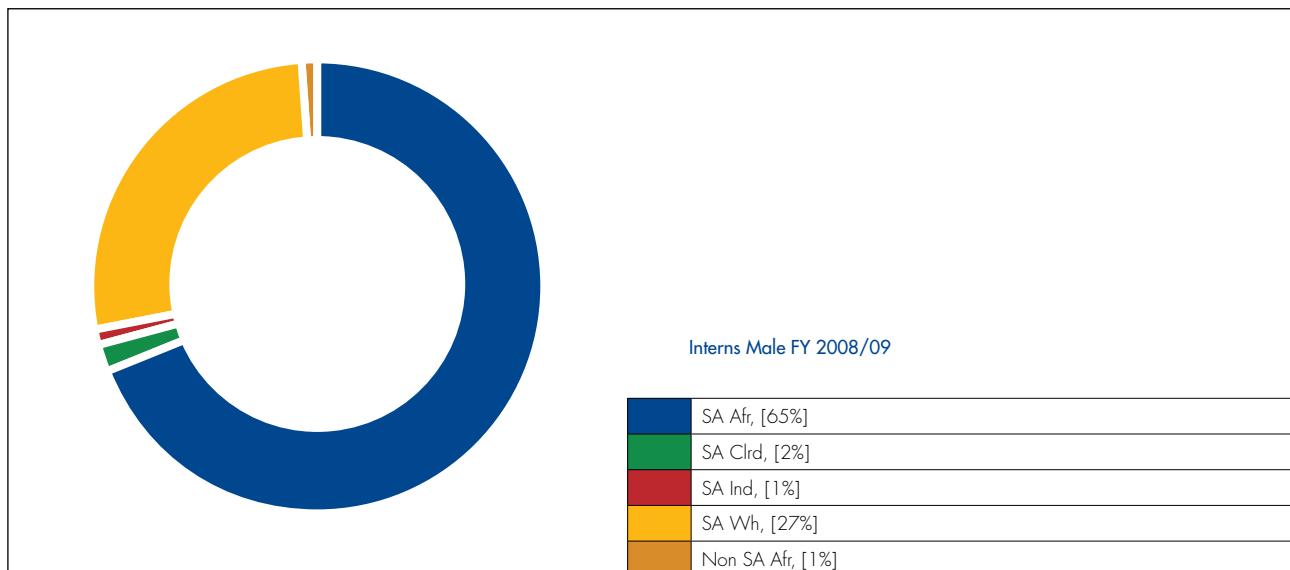


Table 9: Interns at Technology Stations FY 2008/09

Interns at Technology Stations FY 2008/09																
MALE								FEMALE								
	SA Afr	SA Clrd	SA Ind	SA Wh	Non SA Afr	Non SA Wh	Total		SA Afr	SA Clrd	SA Ind	SA Wh	Non SA Afr	Non SA Wh	Total	
Interns	61	2	1	24	1	0	89	Interns	37	5	2	3	0	0	47	

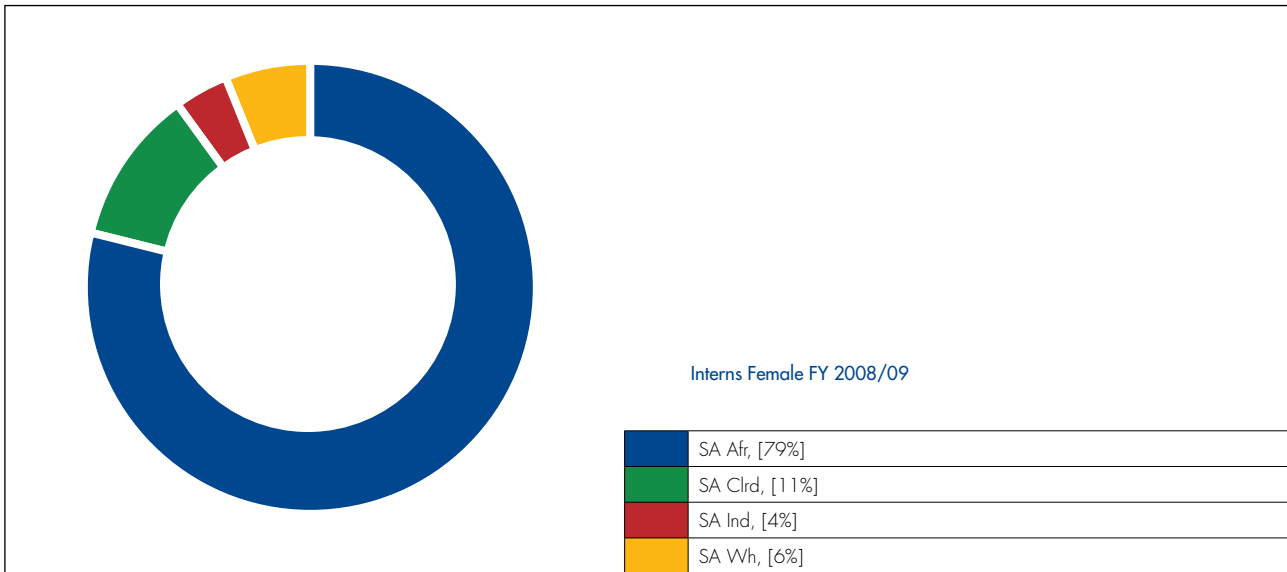
16

Figure 17: Breakdown of the demographics of Male Interns at the Technology Stations/IAT's FY 2008/09



## KEY PERFORMANCE INDICATORS

Figure 18: Breakdown of the demographics of Female Interns at the Technology Stations/IAT's FY 2008/09

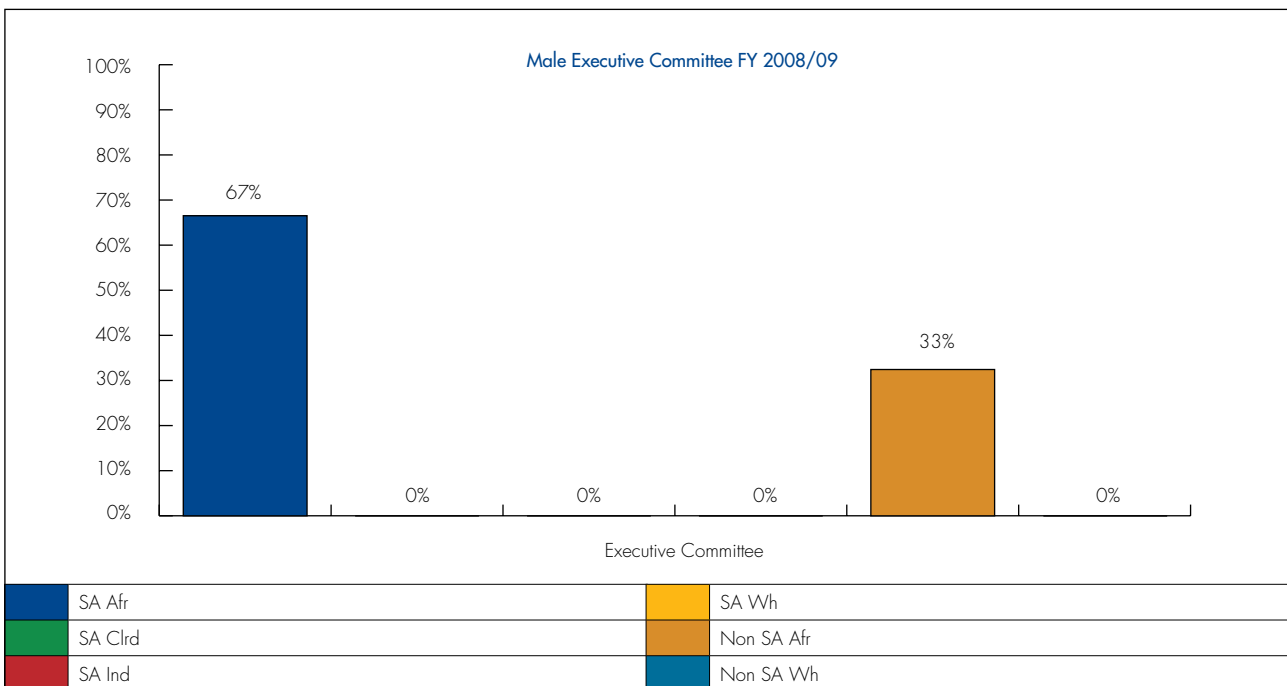


## 2. Demographics at Tshumisano Trust

Table 10: Tshumisano Trust Employees FY 2008/09

	Tshumisano Trust Employees FY 2008/09													Total
	MALE						FEMALE							
	SA Afr	SA Clrd	SA Ind	SA Wh.	Non SA Afr	Non SA Wh	SA Afr	SA Clrd	SA Ind	SA Wh.	Non SA Afr	Non SA Wh		
Executive Committee	2	0	0	0	1	0	1	0	0	1	0	0	5	
Tshumisano staff	5	0	0	0	1	1	5	0	0	3	0	0	15	

Figure 19: Breakdown of the demographics of male Executive Members (Head Office only)



## KEY PERFORMANCE INDICATORS

Figure 20: Breakdown of the demographics of Tshumisano Trust males (Head Office only)

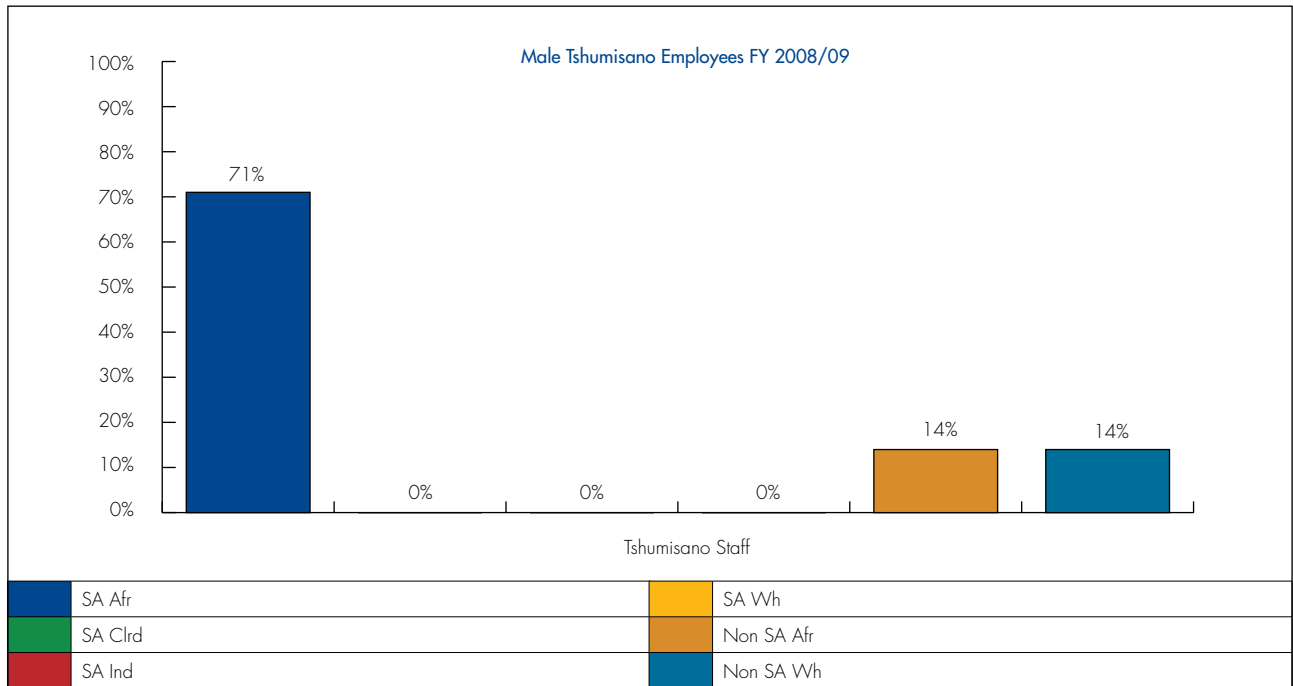
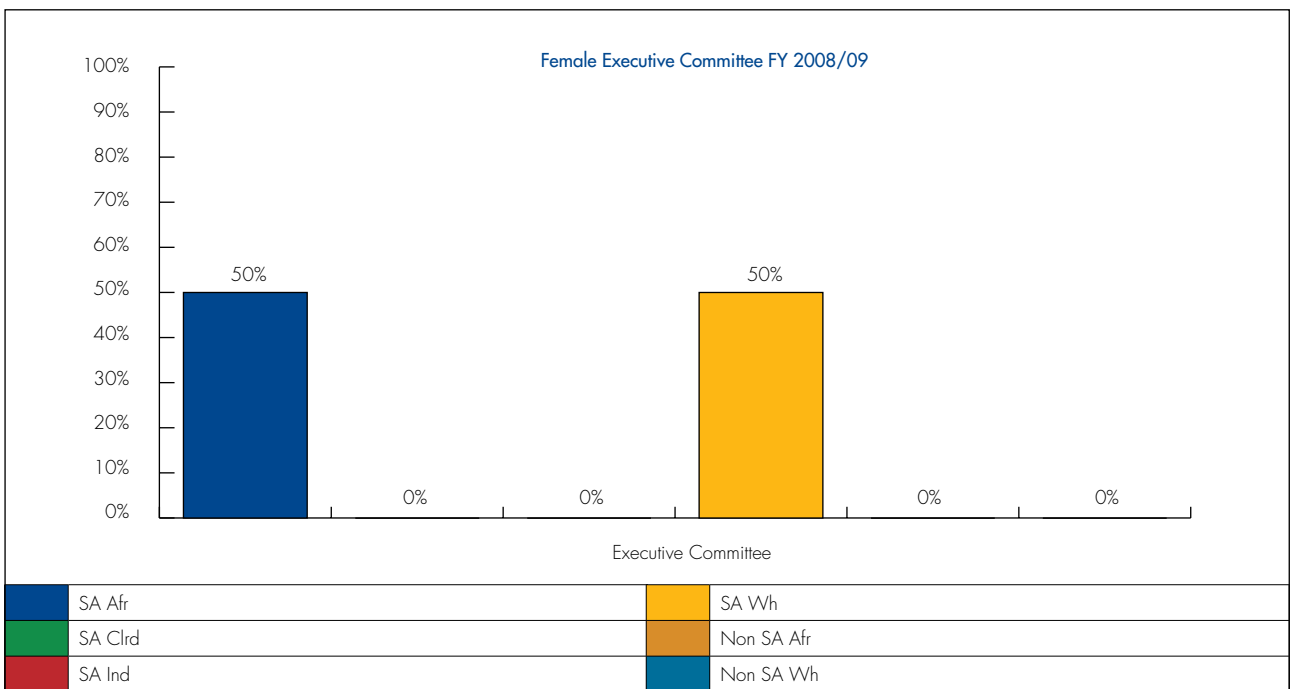


Figure 21: Breakdown of the demographics of female Executive Members (Head Office only)



## KEY PERFORMANCE INDICATORS

Figure 22: Breakdown of the demographics of Tshumisano Trust, female (Head Office only)

