Dam siltation management in South Africa

Sub project 4: capacity development

Deliverable 3: Curriculum design and capacity development strategy [PART 3b]





water & sanitation Department: Water and Sanitation REPUBLIC OF SOUTH AFRICA



Acknowledgements

The National Siltation Management Strategy for Dams in South Africa programme NatSilt is funded by the Department of Water and Sanitation (DWS) and managed by the Water Research Commission (WRC). The programme's overarching aim is to develop and pilot a strategy that will guide, advise and ensure effective siltation management and related improved storage capacity of dams, especially the 320 state-owned dams managed by DWS and any future dams built by DWS.



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About WRC: NatSilt

South Africa is a water scarce country with an expected deficit of 17% by 2030. It has a history of dam building to address water security needs with 320 large dams currently under the management of the state. Sedimentation rates in South Africa are significant when considered alongside increased water demands in the region. Storage capacity losses range between 10% and 30% (Msadala & Basson, 2017) with some dams experiencing 90% sedimentation in the last year, requiring urgent attention on continuous surveying, siltation and sedimentation solution development.

The Water Research Commission (WRC) received a directive from the Department of Water and Sanitation (DWS) on the 10th April 2019 to develop a Siltation Management Strategy for Large Dams in South Africa. The project has been initiated and will be managed by the Infrastructure Build Operate and Maintenance (IBOM) branch within the DWS. Its purpose is to operate and maintain bulk water resource infrastructure in a sustainable manner to ensure an effective and efficient supply of Bulk Raw Water for economic growth, social development and poverty eradication.

The National Siltation Management Strategy for Dams in South Africa programme NatSilt is funded by the Department of Water and Sanitation (DWS) and managed by the Water Research Commission (WRC). The programme's overarching aim is to develop and pilot a strategy that will guide, advise and ensure effective siltation management and related improved storage capacity of dams, especially the 320 state-owned dams managed by DWS and any future dams built by DWS.

This will aid in assisting the DWS in achieving its mandate to operate and maintain bulk water resource infrastructure in a sustainable manner to ensure an effective and efficient supply of bulk raw water for economic growth, social development and poverty eradication.



Sub project 4: training and capacity development

Sub-project 4 (SP4) is one of four projects under the National Siltation Management Strategy for Dams in South Africa. The sub-four projects are:

- SP1 Siltation Management Strategy
- SP2 Dam engineering and socio-ecological systems (SES)
- SP3 Sustainable Dredging of Dams
- SP4 Training and Capacity Development

Aim

The main objective of sub-project 4 is to support the development of an empowered new cohort of skilled professionals and citizens to enhance and improve the efficiency of dam siltation management through training and capacity development. This will be supported by:

- 1) A comprehensive dam siltation management and skills development qualification
- 2) Establishment of community of practice (CoP) to provide strategic guidance and direction. The CoP will assist with the mainstreaming of the Water Infrastructure Manager occupational qualification; expertise and knowledge in the development of the training modules as well as mentoring and collaboration with learners doing course orientated workplace-based assignments. The Community of Practice will include community representatives, local and international dam siltation management experts and practitioners as well as identified and interested learners.
- 3) The development of a Recognition of Prior Learning strategy and toolkit for a Water Infrastructure Occupational Qualification
- 4) Pilot the registered occupational qualification.
- 5) On-going monitoring and evaluation of the value created through learning during the project duration.

This is second part of the third deliverable in the project cycle of SP4. It will be split into Parts a and b for management reasons. In this Deliverable 3b we present the skills programme development process, the engagement of the Community of Expert Practitioners (CEP) in the review of the FOUR proposed skills programmes, present key areas of competence, alignment with the National Qualifications Framework, and reflect on the process of developing skills programmes under the QCTO.



About AWARD

The Association for Water and Rural Development (AWARD) is a non-profit organisation specialising in multi-disciplinary, participatory, research-based project implementation aimed at addressing issues of sustainability, inequity and poverty. We have been in existence for over 20 years. Informing our work are the values of trust, dignity for all, justice, fairness, non-discrimination, unity and learning through practice. Our approach involves thinking across disciplines, boundaries and systems.

While working collaboratively with other organisations and developing strong and rich professional networks, we strive to build natural resource management competence in civil society, government agencies and private enterprise. We believe this will help provide a foundation for robust and sustainable development policy and practice in South Africa that can stand up to an increasingly complex world.



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Qualifications terminology

Assessment Quality Partner (AQP)

A body delegated by the QCTO to develop assessment instruments and manage external summative assessment of specific occupational qualifications.

Credit Accumulation and Transfer (CAT)

An arrangement whereby the diverse features of both credit accumulation and credit transfer are combined to facilitate lifelong learning and access to the workplace.

Credit

A measure of volume of learning required for a qualification, quantified as the number of notional study hours required for achieving the learning outcomes specified for the qualification. One (1) credit is equated to ten (10) notional hours of learning.

Development Quality Partner (DQP)

A body delegated by the QCTO to manage the process of developing specific occupational qualifications, curricula and assessment specifications.

Occupational Qualification

A qualification that consists of a minimum of 25 Credits associated with a trade, occupation or profession. It results from work-based learning, consists of three components (knowledge, practical skills and work experience) and has an external summative assessment.

National Qualifications Framework (NQF)

The comprehensive system approved by the Minister of Higher Education and Training for the classification, co-ordination, registration and publication of articulated and quality-assured national qualifications. The South African NQF is a singled integrated system comprising three coordinated qualifications sub-frameworks for: General and Further Education and Training; Higher Education; and Trades and Occupations.

Occupational qualification document

The QCTO methodology document that defines the learning required to be competent to practise an occupation or occupational specialisation.

Qualification

A planned combination of learning outcomes which has a defined purpose or purposes, intended to provide qualifying learners with applied competence and a basis for further learning and which has been assessed in terms of exit level outcomes, registered on the NQF and certified and awarded by a recognised body.

Qualification type

The classification of a qualification within a sub-framework of the NQF.

QC

One of the three Quality Councils established to develop and manage each of the sub-frameworks of the NQF: CHE for the HEQSF; Umalusi for the GFETQSF; QCTO for the OQSF.



QCTO

The Quality Council for Trades and Occupations established in terms of the NQF Act of 2008. It is tasked to achieve the objectives of the NQF and to develop and manage the Occupational Qualifications Sub- Framework (OQSF).

RPL

The principles and processes through which the prior knowledge and skills of a person are made visible, mediated and assessed for the purposes of alternative access and admission, recognition and certification, or further learning and development.

SETA

A body established in terms of the Skills Development Act to develop and implement sector skills plans and promote learning programmes, including workplace leaning. The QCTO has delegated quality assurance powers to the SETAs.

SAQA

The statutory authority established in terms of the NQF Act of 2008 (which replaced the SAQA Act of 1995) to oversee the further development and implementation of the NQF, the achievement of the objectives of the NQF, and the coordination of the three sub- frameworks.

Sub-framework of the NQF

One of three coordinated qualification sub-frameworks which make up the NQF as a single integrated system: the Higher Education Qualifications Sub-Framework, the General and Further Education and Training Sub-Framework and the Occupational Qualifications Sub- Framework.

Trade

An occupation for which an artisan qualification and relevant trade test is required in terms of the Skills Development Act. SETAs are required to apply to NAMB to have an occupation listed as a trade.

Workplace-based learning

The exposure and interactions required to practice the integration of knowledge, skills and attitudes required in the workplace.



1. Introduction

Under the NatSilt program of DWS and the WRC, SP4 has been tasked to assist with the development of a capacity development framework that scopes out the means, modalities and actions for operationalising an expansive learning and capacity development process to foster the formation of an empowered new cohort of skilled professionals and citizens to enhance and improve the efficiency of dam siltation management in a holistic manner. To this end we introduce, in this document, an overarching framework that adopts a systemic, social learning approach as the basis for designing skills-based learning that will be considered for registration as qualification under the NQF.

This sub-project (4) emphasises developing four occupational qualifications as fundamental to contributing to better long-term dam siltation management (DSM) by practitioners in South Africa. Here capacity development is inclusive of experienced dam managers, young professionals identified as potential successors (supporting, but not limited to, the Department of Water and Sanitation's Learning Academy trainee engineers, scientists and technicians), Catchment Management Agencies, as well as local community representatives. Embedding the planned training in a qualification will grant practitioners the opportunity to gain recognition for their competences and skills. The proposed curriculum framework (with standards) will enable organisations and individuals to understand new standards and thus adapt to the technological changes and challenges by effectively adopting new ways of managing siltation in rivers. In addition to this is the need to effectively pilot this qualification, get market up-take within the workplace and, in the process, to certify DWS staff to carry out the required occupational responsibilities.

An understanding of specific dam siltation management skills needs and supporting institutional structures will allow for the development of appropriate and relevant training and capacity development through the Water Infrastructure Manager Qualification (NQF8). In addition to infrastructure training, training and awareness toolkits must also be developed for stakeholders living and operating in proximity to the dam basin. These training modules will be developed for stakeholders (decision-makers and citizens) that will ensure that the riverine environment or the catchment is not degraded and to ensure local economic development through catchment restoration and beneficiation (ecosystems services and economic uses of dredged sediment).

2. Skills programme architecture

The SAQA cross-field outcomes will be used as a framework to develop the qualification under the Quality Council for Trade and Occupations (QCTO) and align the accreditation and assessment with the appropriate Sector Education and Training Authority (SETA) - Local Government (LGSETA) or energy and water (EWSETA) as appropriate (this decision will be made by the project steering committee in deliberation with the DWS and SP1, 2 and 3 teams). The decision has been taken to work within the Water Infrastructure Manager (WIM) qualification so as not to duplicate or overcomplicate previous efforts and work. SP4 will therefore <u>develop skills programmes</u> under the WIM and other relevant qualifications (explained in detail later) and not develop a new qualification entirely.



3. Skills programme development

The relevant body for the registering a skills programme that is trade and occupation based is the Quality Council for Trades and Occupations (QCTO). The QCTO sets out guidelines and requirements for skills programmes to be registered and available nationally as a recognised programme.

3.1 Standard operating procedures for the development and recording of skills programmes

The following procedure has been outlined by the QCTO for the development and submission of applications for new skills programmes:

- 1. The Skills Development Provider must apply to QCTO to develop a Skills Programme/s.
- 2. The QCTO will check on its list of Skills Programmes if the one applied for is not on its lists of Skills Programmes.
- 3. The QCTO, through its research unit, will look into the relevancy, currency, need and validity of the Skills Programme applied for.
- 4. The Skills Development Provider after receiving an approval from QCTO will develop and submit the Skills Programme to QCTO.
- 5. The developed Skills Programme will be evaluated, moderated and approved by QCTO. QCTO will record a Skills Programme as a National Skills Programme.
- 6. Skills Programmes recorded by QCTO must, inter alia:
 - a. Include Purpose and Rationale of the Skills Programmes; and
 - b. State the minimum requirements to obtain the Skills Programme.
- 7. The QCTO is the final authority that records Skills Programmes on the QCTO Database.
- 8. Skills Development Providers or Quality Partners will advise QCTO, in writing, of Skills Programmes that will no longer be offered. These Skills Programmes, even though no longer offered, still form part of the recorded Skills Programme on the QCTO Database.

In the case of NatSilt, the DWS: *Training Division* has agreed and committed itself to be the applicant. The Association for Water and Rural Development (AWARD) will prepare the application as per QCTO requirements (see Appendix G) and submit it to DWS: *Training Division* who in turn will make the necessary application. It is envisaged that once approved, the DWS: *Water Infrastructure Training Branch* (who is accredited with QCTO as a provider) will offer the approved skills programmes.





Figure 1 Skills programme recording process as specified by the QCTO



4. The curriculum content and course descriptors

The curriculum content is the basis for the development of the skills programmes. The content for the course will be drawn from three key areas: the three NatSilt sub-projects, inputs from the CEP, and the first phase piloting with water practitioners. Other sources will also be consulted. The learning process design will be established by the SP4 team and guided by the QCTO guidelines for skills programmes. The RPL framework and assessment criteria will be incorporated when they become available. It also warrants a mention that the development of the course is an iterative process as various products, documents, models and recommendations come available at different times in the project cycle.

The final piloting phase will afford the reference group and project team the opportunity to make final adjustments before the course is registered and published. The curriculum content is drawn from the following topic areas (Fig 1)



Figure 2 The key areas of curriculum content. The DSM and skills are the most critical for the skills program (in red)

- 1. Context: geophysical, demographic, water use patters, climate
- 2. General dam management: dam designs, specifications, dam capabilities, techniques for DSM
- 3. Routine dam management: financial, budgets, depreciation, planning, staff, resources, safety procedures
- 4. Dam siltation management and skills: DSM techniques, skills, models, equipment, collaboration and contracts
- 5. Legal literacy associated with dam management: legal frameworks, procedures and compliance
- 6. Dam management strategies and plans: National, regional and local, NatSilt strategy, CMS, SDF, operation rules, dredging plans, refurbishment plans etc
- 7. Stakeholder engagement: stakeholder profiles, database, plans for interaction and participation



- 8. Communications: engagement with media, public notices, disaster management networks
- 9. Local economic development: job creation opportunities, EPWP, local municipality programmes, development projects

This content provides a holistic and comprehensive platform for covering all aspects of dam siltation management as currently defined in the NatSilt project documentation. The adoption of a systemic framing means placing DSM within a broader context of catchment governance and management. It also requires thinking and planning under different scenarios such as climate change which is projected to significantly impact on water resources availability and catchment processes throughout the country.

The practice of dam siltation management occurs at the levels of management (advanced), technical (intermediate), operations (foundational) and collaborative action (intermediate) (Figure 2).



Figure 3: Dam siltation management practice levels

Various skills sets are required at the mentioned levels, thereby creating the need to develop curricula for different skills programmes which in-turn are linked to relevant registered parent QCTO occupational qualifications (Figure 3).





Figure 4: Dam siltation management skills programmes with its corresponding registered QCTO occupational qualifications

5. The CEP process & curriculum design

In Deliverable 2 AWARD explained the project design to involve stakeholders in the process of developing and implementing the capacity development aspects of NatSilt over the short, medium and long term. In the process of developing the skills programmes we engaged the collaboration of the Community of Expert Practitioners to assist in the review of the curriculum content.

The Community of Expert Practitioners (CEP) is a group of people with qualifications and/or experience (minimum of 5 years) relevant to the occupation (in this case siltation management) or is recognised by the practitioners of the occupation as experts. The CEP is responsible for the occupational skills programme architecture, content, process and procedure in order to have a skills programmes recorded by the Quality Council for Trades and Occupations (QCTO). They will also ratify the Recognition of Prior Learning (RPL) policy and toolkit to be developed later by the project.

It is expected that the CEP:

- Play a leading role in designing the knowledge & application components, curriculum and assessments.
- Facilitate the recording of Skills Programmes.
- Ensure that Skills Programmes are relevant and advance knowledge and innovation.
- Develop Purpose and Rationale of the Skills Programmes.
- State the minimum requirements to obtain the Skills Programmes.
- Create a basis for and promote lifelong learning (RPL).



5.1 Report on the CEP process

In this section we report on the process of establishment and engagement of the CEP.

5.1.1 Members

During February of 2021 the SP4 project team requested nominations for specialist and experts to be invited to be part of the CEP for Dam Siltation Management Skills Programmes. The project reference group and officials in DWS were approached to ascertain the prospects of establishing a designation and contacts. Invites to attend the introductory CEP meeting were sent to the full datable. The invite letters and content are attached in Appendix B

5.1.2 Institutions

Table 1 depicts the 145 Individuals from a spectrum of specified divisions within the 53 institutions who were invited to form the CEP.

Institution	Designation
Agricultural Research Council	ARC-SCW Research and Development Programmes
AWARD	Research associate
AWARD	Director
Bitou Municipality	Engineering Services
CapeNature	Biodiversity Stewardship programme
СМА	Inkomati-Usutu CMA CEO
СМА	Breede-Gouritz CMA CEO
СМА	Breede-Gouritz CMA Civil engineer
CSIR	Biodiversity and ecosystem services
CSIR	Estuaries
DBSA	Environmental Analyst
DBSA	Head: Environmental and Social Sustainability
DFFE Natural Resource Management	Working for wetlands
DFFE Natural Resource Management	Working for land
DFFE Natural Resource Management	Water use and irrigation development
DFFE Natural Resource Management	Water use and irrigation development
DFFE Natural Resource Management	Working for water
DFFE Natural Resource Management	Working on fire
DWS	Training Manager Technical Engineering Services (IBTC)
DWS	Accreditation
DWS	Chief Directorate: Operational Support
DWS	Engineer
DWS	RQIS (water monitoring)
DWS	Infrastructure branch training

Table 1: List of institutions and designated positions invited to form the CEP



DWS	Department Human Settlement, Water and Sanitation
DWS	Scientific Manager D: Water Resource Planning Systems (Systems Operation)
DWS	Source Directed Controls Directorate
DWS	Dept. of Water and Sanitation: Northern Operations
DWS	Department of Water and Sanitation
DWS : Dam Safety: Regulation	Director
DWS : Engineering Services	Engineering Services
DWS : Engineering Services	Civil Engineering
DWS : Engineering Services	Integrating Environmental Engineering
DWS : Engineering Services	Mechanical and Electrical
DWS : Engineering Services	Technical Engineering Support
DWS : Engineering Services	Chief Engineer
DWS Integrated Water Resources Planning	Director
DWS: Hydrological Engineering	Director
DWS: Hydrological Engineering	Chief Engineer
DWS: Infrastructure Branch	Acting Deputy Director General
DWS: Infrastructure Branch	Chief Engineer
DWS: Infrastructure Branch	Chief Engineer
DWS: Infrastructure Branch	Director: Southern Operations (Western Cape and
	Eastern Cape Province)
DWS: Infrastructure Branch	Director : Eastern Operations NWRI (KZN Province)
DWS: Infrastructure Branch	Director: Northern Operations NWRI (North West , Northern Mpumalanga and Limpopo)
DWS: Infrastructure Branch	Director: Central Operations NWRI (Gauteng , Mpumalanga, Northern Cape and Free State)
DWS: Infrastructure Branch	Technical support
DWS: Infrastructure Branch	Chief Engineer
DWS: Water Monitoring and Information	Scientific manager
DWS: Water Monitoring and Information	Head surveyor on state dams
Environmental programmes branch	Chief Director
Estuary Forum	Unidentified
EWSETA	Acting water sector manager
Freshwater consulting	Unidentified
GIZ	Development partner
Integrated Water Resources Planning	Chief Engineer
Integrated Water Resources Planning	Water Resources Planning Systems
Integrated Water Resources Planning	Water Quality Planning
International water management	ТСТА
International water management	КОВWA
IUCMA	Inkomati-Usuthu Catchment Management Agency
LEROTHOLI polytechnic University (Lesotho)	Lerotholi polytechnic University
LGSETA	LGSETA Water and sanitation
Living Lands	Media specialist
Local Authority	City of Cape Town: Catchment planning
Local Authority	WC Local Government
Local Authority	Kannaland Municipality
Local Authority	SALGA



Local AuthorityCity of Cape Town: Bulk waterLocal AuthorityBeaufort West MunicipalityNBIHead: Climate and waterNedbankHead: SustainabilityNedbankSerior Manager: Sustainability Strategy and ReportingOceans and CoastsUnidentifiedQCTOQDFRhodesProfessor Geography (Tsitsa project)RhodesProfessor Geography (Tsitsa project)RhodesTsitsa projectSAEDNMonitoringSAENNMonitoringSANBIEcological Infrastructure Coordinator for Berg-Breede CatchmentSANBIEcological Infrastructure PartnershipSANBIEcological Infrastructure PartnershipSANBIEcological Infrastructure Coordinator: Pongola- Umzimkhulu water management areaSaNBIEcological Infrastructure Coordinator: Pongola- Umzimkhulu water management areaSouth African National BiodiversityDeputy Director: Social and Organisational Learning Institute (SANBIStellenbosh universityASP Technology / Hydraulic Engineering Division Dept of Civil Engineering Stellenbosch UniversityUKZNHydrologyUKZNHydrologyUKZNHydrologWater BoardAnad Water CEOWater BoardMand Water CEOWater BoardMand Water CEOWater BoardMiss AmuserWits University School of Civil and Environmental EngineeringWater CapeDistrict Manager: Water Resources and Ecological Infrastructure Resources and Ecological InfrastructureWorld BankUniversity	Local Authority	Plettenberg Bay Municipality (Bitou)
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WRC Business Development WRC Research Manager: Groundwater Hydrology WRP Engineer WUA SA Federation for Water User Associations (SAAFWUA), CEO WWF Sustainable agriculture Zutari Project leader	WRC	Research manager: water governance
WRC Research Manager: Groundwater Hydrology WRP Engineer WUA SA Federation for Water User Associations (SAAFWUA), CEO WWF Sustainable agriculture Zutari Project leader	WRC	Business Development
WRP Engineer WUA SA Federation for Water User Associations (SAAFWUA), CEO WWF Sustainable agriculture Zutari Project leader	WRC	Research Manager: Groundwater Hydrology
WUA SA Federation for Water User Associations (SAAFWUA), CEO WWF Sustainable agriculture Zutari Project leader	WRP	Engineer
WWF Sustainable agriculture Zutari Project leader	WUA	SA Federation for Water User Associations (SAAFWUA), CEO
Zutari Project leader	WWF	Sustainable agriculture
	Zutari	Project leader



5.1.3 Attendance and participation

Table 2 below indicates indicate the actual attendance of persons from the invited institutions and the CEP sessions that they attended.

Organisation	Designation	Name	Surname	CEP 1	CEP 2	CEP 3	CEP 4	CEP 5
AWARD	Advisor	Brian	Delcarme	1	1	1	1	1
AWARD	Director	Sharon	Pollard		1			
AWARD	Snr researcher	Hugo	Retief	1	1	1	1	1
AWARD	Research associate	Derick	Du Toit	1	1	1	1	1
BGCMA Breede-Gouritz Catchment Management Agency	CEO	Mkhanyiseni	Zimu	1		1		
Bitou Muni	Engineer	Samuel	Franclyn					
Bitou Municipality	Engineer	Ronald	Tarentaal	1		1		
Bitou Municipality	Engineering Services	Francly	Samuel			1		
Bitou Municipality	Engineering Services	Etienne	de Waal					
CMA	Breede-Gouritz CMA	Elkerine	Rossouw	1				
DWS	Chief Directorate: Operational Support	Mr Setsopo Tsibiso	Maphutha	1				
DWS	RQIS (water monitoring)	Thembi	Masilela		1			
DWS	Source Directed Controls Directorate	Ms Tovho	Nyamande					1
DWS	Infrastructure branch training	Molatelo (Rosa)	Mfomadi-Rahube		1		1	
DWS	Engineer	Richard	Martin				1	
DWS	Accreditation	Lerato	Makola					1
DWS	Engineer	Thulani	Mahlangu				1	1
DWS	Engineer	Moroesi	Mokhosi				1	1
DWS	Engineer	Rudzhani	Mulaudzi				1	1
DWS	Engineer	Stephen	Maycock				1	1
DWS Engineering Services	Chief Engineer	Allestair	Wensley		1		1	1
DWS Engineering Services	Engineering Services	AL	Chaminuka			1		
DWS Engineering Services	Civil Engineering	Ezekial	Koadibane					1
DWS Engineering Services	Technical Engineering Support	Vincent	Monene	1				
DWS Infrastructure Branch	Acting Deputy Director General	Leonardo	Manus	1				
DWS Infrastructure Branch	Chief Engineer	Glenn	Daniell					
DWS Infrastructure Branch	Director: Northern Operations NWRI (North West , Northern Mpumalanga and Limpopo)	Thabo	Monaisa		1			
DWS Infrastructure Branch	Technical support	Hannes	Pretorius	1		1		
DWS Infrastructure Branch	Chief Engineer	Abdulla	Sayed			1		
DWS Integrated Water Resources Planning	Director	Patrick	Mlilo		1			

Table 2: CEP members



DWS Integrated Water Resources Planning	Water Resources Planning Systems	Jackie	Jay	1				
DWS Integrated Water Resources Planning	Water Quality Planning	Pieter	Viljoen	1				
International water management	ТСТА	Richard	Holden	1				
LEROTHOLI	lerotholi polytechnic University (Lesotho)	Dr Liphapang	Khaba	1	1	1	1	1
QCTO	QDF	Vern	Groenewald	1	1	1	1	1
Rhodes	Geography (Tsitsa project)	Kate	Rowntree	1	1	1	1	1
SANBI	Freshwater Biodiversity Unit	Nancy	Job	1				
Sun	ASP Technology / Hydraulic Engineering Division Dept of Civil Engineering Stellenbosch University	SP3 (Professor Gerrit R)	Basson	1				
SUN	Researcher	Dr	Vonkeman	1				
UFS	Geography	Jay	Le Roux	1				
Univen	Lecturer	Sekgala	Mosibudi	1			1	
Water Utilisation	Director	Beason (Dr)	Mwaka	1		1		
WISA	WISA	Anita	Pillay	1	1			
WRC	Project mgr	Lesego	Gaegane	1	1			
WRC	Research manager: water governance	John	Dini	1				
WRC	Executive Manager - Water Resources and Ecosystems	Shafick	Adams	1				
WRC	Project Mgr	Michelle	Hiestermann		1		1	
Zutari	Project manager	SP1 (Louise)	Lodenkemper	1				
Zutari	Project manager	SP2 (Frank)	Denys	1				
Unknown	Bosch holdings	Andrew	Knox	1				
Unknown	Unknown	Minenhle	Goge	1				
Unknown	Unknown	Freddy	Rabothata	1				
Unknown	Unknown	(Unknown)	Mongezi	1			1	
ASP Technology (Pty) Ltd	Researcher	Hanief	Ally	1			1	
Unknown	Unknown	Nomsa	Masemola	1				1
Unknown	Unknown	(Unknown)	Mahao	1			1	1
Unknown	Unknown	Ettiene	(Unknown)			1	1	1
WRC	Graduate	Zenhlanhla	Mthembu				1	1
		•		33	14	13	16	14

The following are worth noting:

- 1. Of the 145 invited 33 attended the first 'orientation' session. Thereafter the number stabilized at an average of 14 per session.
- 2. The designation of persons attending was senior suggesting the level of importance with which this process was regarded.
- 3. The scope of institutions included academic, technical, government department officials from an array of directorates, consultants and engineers.
- 4. The most inputs were provided by academic persons, senior managers and engineers in the DWS.
- 5. Unfortunately, the virtual platform used did not trap all personal data as the invite did not require a registration process, only a RSVP.



5.1.4 Sequence and processes of meetings

Engaging a collective or experienced professional in the development of the skills programmes for dam siltation management is crucial in terms of developing quality learning programmes. The process of involvement of CEP members are as follows:

- 1. CEP members identified
- 2. CEP database established
- 3. CEP invites sent out
- 4. CEP meetings held
 - a. CEP 1: introductory meeting held and members orientated to the functions and purpose of engagement
 - b. CEP 2: Dam Siltation Manager skills programme
 - c. CEP 3: Dam Siltation Technician skills programme
 - d. CEP 4: Dam Siltation Process Controller skills programme
 - e. CEP 5: Dam Siltation Network and Partnerships Co-ordinator

5.1.5 Incorporation of comments

The process followed in each CEP session was to reflect on the activities from the previous meetings, introduce the skills programme under discussion, deliberate on the purpose, rationale and proposed topics of the skills programme and make amendments as the CEP members deemed necessary.

The issues raised by the CEP members included the following:

- a. Inputs into the rationale are important for creating purpose and direction for the skills programmes and are essential for the QCTO to understand the reason for registering the skills programme
- b. Issues of clarification of terms and definition was important in the CEP meetings as much of this work is novel
- c. Links of dam siltation management to the catchment was regarded as critical in siltation management with emphasis on stakeholder engagement and ecological infrastructure
- d. Issues of methods were frequently raised for example with the estimation of siltation and sedimentation
- e. Limitation to what a particular practitioner should /can do was raised. This is fundamental to the skills programme as it needs to align with the responsibilities of a particular position in the workplace
- f. Suggestion of topics for each of the skills programmes
- g. Suggestions for the alignment of the skills programmes with each other to avoid duplication and overlap
- h. The relationship between knowledge modules and the skills application modules
- i. What prior learning is expected from a practitioner to enter the various programmes



	knowledge	activity application	techniques			level				
						operator	technician	manager	other departments	civil society
How much sediment enters the sediment and when?	sediment load discharge relationships	sediment monitoring in flow upstream of reservoir inlet	hand sampling of flows with focus on floods	turbidity metres (not so accurate at high turbidities)	sediment yield modelling (high uncertainty unless calibrated against real data)	4	4	1		
	suspended land v. bedload									
Where does the sediment come from?	catchment process that drive the sediment system	sediment source identification	aerial surveys; first hand observations in the catchment	sediment source tracing	sediment yield modelling		1	~		
How can sediment yield be reduced?	erosion control measures for catchment scale rehabilitation	implementation of erosion control measures focussed on key sediment sources	flow regulation & sediment trapping	land use measures including grazing controls	improved road design			V	V	
What can the public do to limit sediment input to the dam	impact of land use practices on the sediment system; awareness of potential benefits to livelihoods and to climate change adaptation	implementation of erosion control measures on own property	adopt conservation agriculture/ gardening	land use measures including grazing controls				V	V	V
What are the downstream impacts of sediment depletion or sediment releases?	channel response to changing sediment supply	monitoring downstream response	bed sediment sampling	cross section surveys	aerial surveys	1	1	1	V	

Figure 5 Figure 4 Example of inputs from a CEP member

5.2 Reflections on the CEP process

The design of using the CEP as a professional platform for building quality skills programmes is a sound one but not without challenges. In this section we reflect on the CEP and its processes.

1. Not all CEP members are familiar with SAQA and QCTO processes

Many of the CEP members were technical specialists, engineers, managers or simply interested parties which meant that although they have the technical expertise they do not necessarily have experience with the National Qualifications Framework and the process driven by the South African Qualifications Authority and the Quality Council for Trades and Occupations. Academics and those involved in education were more comfortable with the ideas of learning process design and outcomes based learning. The involvement of a broad spectrum of professionals in the CEP process is not in itself problematic as the group were able to learn from each other and make contributions as they deemed fit. It was however important to provide good facilitation and guidance on what was expected from the CEP at the beginning of each session in order to focus and the engagement process.

2. Continuity and consistency are important

In order to achieve maximum benefit from the CEP process we found it important to focus on continuity, consistency and coherence. It was therefore important to ensure that the CEP process was well designed in advance of engaging the CEP partners so that they are clearly informed as to what is expected of them. The design features we relied on in the development of the NatSilt skills programmes included:

- a. The first CEP meeting was dedicated to orientating those invited to be members on the roles and responsibilities of the CEP so that they could ascertain if they could contribute meaningfully and if they had time available to be part of the process,
- b. We were consistent in the procedure for inviting and notifying participants to assist members to minimise confusion and fatigue.



- c. We sent out relevant documents for the forthcoming CEP meetings a week in advance
- d. We scheduled meetings for the same time each week for a period of 5 weeks in order to establish a rhythm
- e. Meetings were kept to 3 hours by using a virtual platform. This feature was useful in reducing costs associated with face-to-face meetings

3. Everything cannot be accommodated at first stage of the CEP consultations

It was clear that not all issues could be addressed in the CEP sessions and members were allowed to work outside the sessions and provide comments by a stipulated time and date. It was therefore important to have had a sound means for recording comments and inputs from the members. This afforded the team with the opportunity to respond to the concerns away from the virtual meetings and in some cases follow up with individuals to obtain clarity.

4. Learning platform for the water sector and creating a community of professionals

The virtual CEP process is a valuable platform in the process of developing skills programmes in that a broad spectrum of professionals can be approach to obtain consensus and perspective for workplace-based training. Such consultative processes are not always possible especially where senior managers and specialists are not always readily available for lengthy office meetings.

5. Responsibilities of practitioners in the workplace

The CEP inputs were valuable in determining what the responsibilities for dam siltation practitioners might look like. This is especially important in the light of the dam siltation strategy being an innovation in the water sector. However, it brings new responsibilities for which practitioners (at numerous levels) must be prepared. The CEP members had the opportunity to deliberate on the scope, sequence and depth of tasks for 4 levels of practitionership to be associated with dam siltation management

6. The titles of skills programmes are important

The way in which skills programmes are identified is crucial for the registration, rationale and association of the training with the appropriate practitioners in the workplace. The team found that the alignment of knowledge module content and application modules with particular practitioners needs to be established at an early stage and within the CEP consultative process so that the correct and appropriate levels on the National Qualification can be established. This is where the CEP was invaluable in providing experience.

7. Need for a clear and concise motivation or rationale

Following from the point above, it was essential for the CEP to develop a clear and concise rationale for the skills programme. The rationale is in the form of a statement that permits the QCTO to evaluate the need for such a programme at a national scale and also to determine that there are no duplications or overlap with existing skills programmes. The details of the rationale development process are dealt with later in this document.

8. Checking flow of tasks is important integrating activity

The CEP process was valuable for checking the flow and sequence of tasks in the development of skills-based qualifications. it was crucial, in the case where teams of practitioners were tasked to perform dam siltation management, that alignment occurred between sequences of events and operations. Misaligned actions will result in the achieved outcome not being achieved.



9. Correct level of NQF being met

One of the challenges for the project team was to ensure that the curriculum content provided by the CEP is correctly aligned with the appropriate level on the National Qualifications Framework. Since the Natsilt Programme will deliver four skills programmes that are linked to parent qualifications the task was simplified. However, it is worth noting that this is an important step in determining the nature and level of the training.

10. Matching to existing parent qualifications

Further to the point above it is an important step in the development of skills programmes that they are correctly matched to a relevant parent qualification. It is critical to ensure that the skills programmes are related to registered parent occupational qualifications so that articulation (vertical and horizontal) into other water related courses are made possible.

Do new skills programmes require the creation of new posts?

One of the key issues raised related to the introduction of new skills in the workplace. The decision needs to be taken as to whether the existing staff will be "up skilled" through the skills programme or if a new staff member needs to be appointed to a new position. This matter was unresolved in relation the Dam Siltation Process Controller and Dam Siltation Networking and Partnerships Coordinator.

11. Reliance on sub projects to deliver content

In the case a complex project such as NatSilt, there are a number of interrelated projects that each deliver different content, strategies, tools, guidelines and recommendations for the management of dam siltation. All of this content needed to be directed to a relevant skills programme. In important lesson is that the content-generating projects should ideally precede the skills programme development process and project teams' members should be available to give guidance as necessary.

12. Issues of patent and intellectual property in the development of courses

If there are issues related to patents and intellectual property, they should be ironed out before course content is developed to avoid conflicts and tensions later in the process of course design.

13. Attention to stages of skills programme development

It is vital that the correct sequence skills programme development is followed to avoid unnecessary duplication and delays. Developing the course content prior to registration and approval is ill advised as there are a number of compliance issues that need to be addressed in the registration of a national programme.

6. Skills Programme Curriculum Structure

In the following section we provide the basics of the skills programmes curriculum design with alignment to the appropriate registered parent occupational qualifications. The content alignment and matching will be verified with inputs from the reference group and CEP.

6.1 Dam Siltation Manager



The purpose of this skills program is to provide learning and development so that the learner is equipped with the necessary knowledge and application skills to operate as a Dam Siltation Manager. Based on the plan developed using the NatSilt model a Dam Siltation Manager, in collaboration with relevant water related institutions, will be able to effectively and efficiently reduce, mitigate and manage sediment build-up (siltation) for effective and efficient long-term dam siltation management in order to secure water resource quantity and quality for users (yield, performance, sustainability, longevity, supply, security, water quality etc.). Effective management of sediment requires a multifaceted approach, from catchment interventions to reduce input to controlling sediment stored in the reservoir. The dam siltation manager therefore needs to gain knowledge of sediment processes at a range of temporal and spatial scales sufficient to oversee activities designed to reduce dam sedimentation and increase water storage capacity. The DSM will be responsible for working with catchment based agencies such as CMFs and WUAs to effect erosion control measures for catchment sediment yield reduction. The DSM will also need to work with the RDM directorate of DWS to mitigate downstream impacts of changes to sediment on the water resource quality. Furthermore, the dam siltation manager will need to work closely with the Networks Facilitator.

The Dam Siltation Manager skills programmes curriculum development conceptual framework is illustrated in Figure 5.



Figure 6: Dam Siltation Manager skills programmes curriculum design conceptual framework

The CEP agreed that the Dam Siltation Manager performs the following key tasks:

• Manage and control the operations and maintenance of dams



5

15 8

- Implement the dam siltation management strategy
- Implement models to estimate the siltation volume in dams
- Monitor and report on dam siltation
- Enable partnerships with stakeholders

In performing those tasks, the Dam Siltation Manager need to adhere to and carry out the following responsibilities:

- Assess dam capacity, capabilities (with respect to scouring, flushing etc.) and dam types/designs
- Calculate water requirements/use for a specific dam
- Implement operation models and operational rules for each season
- Conduct seasonal flood progression modelling and impact analysis
- Contribute to the establishment and maintenance of sediment oriented monitoring networks. ٠
- Appraise the components of the DSM Strategy with expected outcomes •
- Draft a DSM implementation plan from strategic guidelines
- Implement actions as outlined in the dam siltation management plan •
- Support source intervention activities in the catchment
- Implement models to estimate the siltation volume in dams •
- Monitor and report on dam siltation •
- Enable partnerships with stakeholders
- Apply different dam siltation prediction models for catchment sediment yield estimation (input to dam) and within-dam sedimentation.
- Interpret dam siltation prediction model results •
- Identify limitations of the models and address the effect
- of potential/likely areas of uncertainty on sediment management. •
- Perform a cost benefit analysis in relation to sediment intervention options based on • modelled results.
- Assess and review partnership roles
- Develop a key stakeholders working group or collaborate with other existing networks e.g. CMF
- Fully integrate partners and resource into dam siltation management
- Cross check with the responsibilities of the network facilitator

The knowledge and skills (application) sets required to performed these task and carry out the related responsibilities are listed in Table 3.

	Curriculum Component Specifications							
Module	Title	NQF Level	Credits					
	Knowledge Skills Modules							
SP01-KM-01	Legislation, regulations, policies and guidelines applicable to	8	5					
SP01-KM-02	dam siltation management							
SP01-KM-03	Dam operations and maintenance optimisation	8	15					
	Integrated dam information management system	7	8					

Table 3: Dam Siltation Manager curriculum component specifications



	Total number of credits for I	Knowledge M	odules: 28
	Application Skills Module		
SP01-AM-01	Develop dam specific operation and maintenance plans	8	20
	guided by the National Siltation strategy		
SP01-AM-02	Technical operational and planning modelling	8	20
SP01-AM-03	Information management processes	7	10
SP01-AM-04	Establish and monitor stakeholder relations and engagement	8	2
	Total number of credits for A	pplication M	odules: 52

See Appendix c for a detailed description of the curriculum outline.

6.2 Dam Siltation Technician

The purpose of this skills programme is to prepare a learner to operate as a Dam Siltation Technician. A Dam Siltation Technician monitors, manages, and controls siltation in dams for sustainable water production and security.

The Dam Siltation Technician skills programmes curriculum development conceptual framework is illustrated in Figure 6.



Figure 7 Dam Siltation Technician skills programmes conceptual framework



The CEP agreed that the Dam Siltation Technician performs the following key tasks:

- Monitor, control, verify and manage the entire dam processes
- Validate the calibration of measuring equipment and instruments
- Verify dam and equipment malfunctioning and coordinate routine operating tests and preventative maintenance
- Communicate dam parameters, conditions, work plan and dam status with relevant stakeholders
- Perform dam related administrative and supervisory functions

In performing those tasks, the Dam Siltation Technician need to adhere to and carry out the following responsibilities:

- Evaluate and optimise performance of the dam
- Manage routine operations of the dam
- Monitor and implement environmental and site specific procedures on operations
- Operate and monitor dam inflows, outflows and quality through automated interfaces to achieve the required output quality and quantity of dam water
- Perform troubleshooting of the dam operation related issues
- Analyse performance data and identify areas for potential operational improvements
- Maintain and verify the authenticity of measurements and results
- Plan and coordinate preventative and corrective maintenance of dam infrastructure and equipment
- Monitor dam operator assistants and measure effectiveness of performance
- Monitor dam and equipment for malfunctioning and coordinate routine operating tests and arrange for maintenance
- Report and log tactical and non-tactical maintenance defects and coordinate availability of dam to perform repairs
- Manage inter-disciplinary communication and coordination of plant operations
- Monitor dam operator assistants and measure effectiveness of performance
- Coach and mentor other dam operators and assistants in order to enhance individual performance in a work environment

The knowledge and skills (application) sets required to performed these task and carry out the related responsibilities are listed in Table 4.

Curriculum Component Specifications								
Module	Title	NQF Level	Credits					
	Knowledge Skills Modules							
SP01-KM-01	Optimisation and control of dam siltation	6	9					
	management infrastructure							
SP01-KM-02	Siltation control and Instrumentation	5	10					
SP01-KM-03	Troubleshooting	5	5					
SP01-KM-04	Dam siltation infrastructure supervision and	5	5					
	control							

Table 4: Dam Siltation Technician curriculum component specifications



	Total number of credits for Knowledge Modules: 29			
Application Skills Module				
SP01-AM-01	Evaluate, monitor, and optimise the performance	5	20	
	of dam operations for siltation management and			
	process			
SP01-AM-02	Interact and interface with dam operations using	5	20	
	control systems			
SP01-AM-03	Control tactical and non-tactical maintenance	5	5	
	operations			
	Total number of credits for Application Modules: 45			

See Appendix D for a detailed description of the curriculum outline.

6.3 Dam Siltation Process Controller

A Dam Siltation Process Controller operates, monitors, reports and activates the unit sediment processes at the dam with the purpose of reducing the amount of sediment build-up in dams according to operational, statutory and regulatory requirements. A Dam Process Controller implement the operating rules (under supervision), monitor and report for informed decision making.

The Dam Siltation Process Controller skills programmes curriculum development conceptual framework is illustrated in Figure 7.



Figure 8: Dam Siltation Process Controller skills programmes curriculum design conceptual framework

The CEP agreed that the Dam Siltation Process Controller performs the key tasks of Inspect, operate and control physical unit processes and equipment of the dam.

In performing those tasks, the Dam Siltation Process Controller need to adhere to and carry out the following responsibilities:



- Inspect, operate and control physical processes and equipment
- Inspect, operate and control silt treatment and handling processes and equipment
- Operate automated process control systems and computer equipment

The knowledge and skills (application) sets required to performed these task and carry out the related responsibilities are listed in Table 5.

Curriculum Component Specifications				
Module	Title	NQF Level	Credits	
Knowledge Skills Modules				
SP01-KM-01	Overview of the dam siltation context 3		6	
SP01-KM-02	Physical Treatment Process	ent Process 3 12		
SP01-KM-03	Silt treatment and handling 3		6	
SP01-KM-04	Equipment and Materials 3		6	
Total number of credits for Knowledge Modules: 30			lules: 30	
Application Skills Module				
SP01-AM-01	Inspect, operate and control physical processes and	3	5	
	equipment			
SP01-AM-02	Inspect, operate and control silt treatment process 3		15	
	and disposal processes and equipment			
SP01-AM-03	Sediment Sampling and testing at dams 3		15	
SP01-AM-04	Operate automated process control systems and	3	5	
	computer equipment			
SP01-AM-05	Operation and control of mechanical and electrical	3	10	
	equipment and monitoring of instrumentation			
Total number of credits for Application Modules: 4		lules: 45		

 Table 5: Dam Siltation Process Controller curriculum component specifications

See Appendix E for a detailed description of the curriculum outline.

6.4 Dam Siltation Network and Partnership coordinator

The purpose of this skills program is to provide learning and development so that the learner is equipped with the necessary knowledge and application skills to operate as a Dam Siltation Network and Partnership Coordinator. A Dam Siltation Network and Partnership Coordinator acts as a facilitator and change agent in support of stakeholder networking/participation by establishing and maintaining networks and partnerships, building a discourse for dam siltation management amongst a broad spectrum of stakeholders and co-ordinating communication, activities and networks for dam siltation management. The purpose of the Dam Siltation Network and Partnership Coordinator is to foster catchment scale interventions such as the adoption of land use practices and erosion management interventions that support the aim of reducing dam siltation. The DSN&PC needs to



establish systemic approaches and processes that include all system components and role players involved in land use activities that impact on dam siltation (e.g. mining, agriculture, industry and human settlements). This involves 1) exploring ways to incentivise land users to adopt practices that reduce dam siltation, 2) engagement with stakeholders who can facilitate such practices through policy and incentives, 3) working with the land users to facilitate the adoption of erosion reduction practices. The DSN&PC needs to facilitate stakeholder collaboration and develop a catchment community that supports sound maintenance of dams through the realisation of economic opportunities linked to sustainable land use and to activities linked to the dam itself. The DSN&PC need to be capable of stakeholder negotiations, conflict resolution and supporting collaborative action.

The Dam Siltation Network and Partnership Coordinator skills programmes curriculum development conceptual framework is illustrated in Figure 8.



Figure 9: Dam Siltation Network and Partnership Coordinator skills programmes conceptual framework

The CEP agreed that the Dam Siltation Network and Partnership Coordinator performs the following key tasks:

• Establish, monitor, evaluate and report on existing dam siltation network communications and initiatives for dam siltation management



- Facilitate the further establishment and coordination of networks and foster partnerships in pursuit of effective dam siltation management and adoption of good land use practices at a catchment level.
- Integrate and align stakeholder initiatives and processes within a designated area of responsibility and aligned to relevant legislative and policy frameworks as well as management and implementation plans.

In performing those tasks, the Dam Siltation Network and Partnership Coordinator need to adhere to and carry out the following responsibilities:

- Identify the need for DSM networks and facilitate the establishment of the appropriate structures
- Negotiate vision and purpose for the network
- Draft and maintain stakeholder communication network plan
- Establish communications protocols and mechanisms (including media)
- Monitor existing dam siltation network communications initiatives
- Analyse effectiveness of network communication
- Participate in the evaluation of existing dam siltation network communications initiatives, identify potential challenges and recommend appropriate corrective actions
- Facilitate stakeholder negotiations, conflict resolution and support collaborative action
- Compile reports with regard to the process and progress of initiatives dam siltation network communications
- Acquire comprehensive knowledge of all dams on a catchment basis and basic knowledge of DSM
- Facilitate purpose-driven DSM networks through collaboration and partnerships for supporting sustainable DSM actions
- Appraise the components of the DSM Strategy that requires stakeholder engagement
- Understand land use practices and how they affect dam siltation
- Create stakeholder awareness, appropriate understanding and learning for reducing sedimentation and siltation in dams
- Explore opportunities for local economic development associated with DSM (eg. dredging, brick making, etc.)
- Establish relevant projects, monitor and report their performance
- Gain an understanding of all the legislation, policies, strategies and plans relevant to DSM
- Gain an understanding of all the stakeholder processes and initiatives in the designated water management area
- Apply tools and frameworks for managing stakeholder databases and activities in DSM
- Manage stakeholder databases for supporting DSM networks
- Liaise and partner with relevant stakeholders regarding DSM network co-ordination processes and initiatives
- Interpret and analyse stakeholder engagement patterns and trends from databases
- Compile reports with regard to the process and progress of dam siltation network initiatives

The knowledge and skills (application) sets required to performed these task and carry out the related responsibilities are listed in Table 6.

Table 6: Dam Siltation Network and Partnership Coordinator curriculum component specifications



Curriculum Component Specifications				
Module	Title	NQF Level	Credits	
Knowledge Skills Modules				
SP01-KM-01	DSM Foundational siltation practice and	3	4	
	catchment-based approaches			
SP01-KM-02	Networks Coordination, Administration and	4	5	
	Programme Management			
SP01-KM-03	Dam Siltation Communications 5		8	
SP01-KM-04	Learning networks and associated practices 5		8	
Total number of credits for Knowledge Modules: 25			ules: 25	
Application Skills Module				
SP01-AM-01	Plan a catchment-based DSM network using	5	4	
	existing databases			
SP01-AM-02	Evaluate and monitor, identify potential problems	5	4	
	and recommend appropriate corrective actions for			
	DSM networks			
SP01-AM-03	Compile reports on network initiatives 5		3	
SP01-AM-04	Identify the need for DSM networks and facilitate	5	8	
	the establishment of the appropriate structures			
SP01-AM-05	Motivate and mobilise the efforts of stakeholders	5	6	
	within the network (Including relevant			
	governmental departments)			
SP01-AM-06	Assist with the communication and discourse	5	6	
	building of DSM outcomes			
SP01-AM-07	Liaise, negotiate and partner with relevant	5	2	
	stakeholders regarding network partnerships and			
	collaborations			
	Total number of credits for Ap	plication Mod	lules: 33	

See Appendix F for a detailed description of the curriculum outline.

7. Stakeholder engagement in NatSilt

One of the key milestones in the development of four skills programmes for workplace-based training has been achieved in the establishment and engagement of the CEP to date. However, the CEP engagement is not complete. We discuss below the plans to further engage the CEP and then explain how the 2 remaining 'arms' of the stakeholder engagement plan will occur.

7.1 Next steps in the engagement of the CEP

The engagement of the CEP members in the development of the skills programme is not yet complete. The design is for the CEP to be informed of the changes made to the skills programmes under their direction and then to approve their submission to the QCTO for registration. Once the skills programmes are registered there is the intention to continue engaging members of the CEP in the



development of the course content. They will also be consulted on the nature of prior learning required for the entry of practitioners into the respective courses.

We have noted that a number of stakeholders invited to the CEP have not been able to actively participate in each of the meetings but they have requested to be kept abreast of the developments or have offered other ways of contributing to the group. This is an important contribution to the professional community as intentioned by the formation of the CEP.

Once the skills programmes and course materials are complete the CEP members will then revert to the database for Community of Practice group designed by the NatSilt team. The details of the CoP group will be the focus of future deliverables as it needs to align with the outputs of another sub project in the NatSilt programme suffice to say that the CEP members of the CoP will guide on the uptake and institutionalisation of the skills programmes in various ways. Certainly, there will be a reliance on these members to guide on the piloting of the course (Phase 2) and advise on the future participants in the course.



7.2 The stakeholder engagement plan

As explained in deliverable 2, in order to meet NatSilt requirements the SP4 team has designed 3 different categories for the engagement of stakeholders. These are the **Community of Expert Practitioners (CEP); Community of Practice (key stakeholders); and the Dam Siltation Management (DSM) Communications Network** (see Figure 9). Each of these groups fulfils a different purpose in the achieve of the stakeholder plan. As we move away from the development and registration of the FOUR DSM skills programmes so we will approach piloting and implementation of the training course via the proposed e-learning platform.



Figure 9 Stakeholder engagement plan

Component of the Stakeholder Plan	Proposed functions
1. Community of Expert Practitioners (CEP)	 Inputs and guidance in the development of the Curriculum framework for FOUR skills programmes for Dam Siltation Management
2. Community of Practice (key stakeholders)	 Support and guidance in the implementation of the training modules Identify institutional home for the courses Provide relevant resource materials and case studies Identify potential participants within their respective institutions
3. DSM Communications Network	 Provide the basis for the development of a dam siltation discourse (language and awareness) Establish means of communication with key stakeholders Utilize multi-media to communicate messages Identify need for website, media contacts and branding for DSM strategy



8. Plans for the way forward

The next stages of the NatSilt Sub Project 4 will entail the following:

- 1. The registration of four skills programmes with QCTO
- 2. Proceed with developing course content for each of the skills programmes
- 3. Registration and launching of the e -learning platform
- 4. Determine the institutional framework for hosting and implementing the four skills programmes
- 5. Determine the nature of prior learning for each skills programme
- 6. Exploring the prospect of a Youth Programme for understanding workplace skills development

9. Appendices

Appendix A Qualifications terminology

Appendix B Community of Expert Practitioners documentation

Appendix C Dam Siltation Manager Curriculum Outline

Appendix D Dam Siltation Technician Curriculum Outline

Appendix E Dam Siltation Process Controller Curriculum Outline

Appendix F Dam Siltation Network and Partnership Coordinator Curriculum Outline

Appendix G Skills programmes applications to QCTO

- a. Dam Siltation Manager
- b. Dam Siltation Technician
- c. Dam Siltation Process Controller
- d. Dam Siltation Network and Partnership Coordinator



Appendix A: Qualifications terminology

Assessment Quality Partner (AQP)

A body delegated by the QCTO to develop assessment instruments and manage external summative assessment of specific occupational qualifications.

Credit Accumulation and Transfer (CAT)

An arrangement whereby the diverse features of both credit accumulation and credit transfer are combined to facilitate lifelong learning and access to the workplace.

Credit

A measure of volume of learning required for a qualification, quantified as the number of notional study hours required for achieving the learning outcomes specified for the qualification. One (1) credit is equated to ten (10) notional hours of learning.

Development Quality Partner (DQP)

A body delegated by the QCTO to manage the process of developing specific occupational qualifications, curricula and assessment specifications.

Occupational Qualification

A qualification that consists of a minimum of 25 Credits associated with a trade, occupation or profession. It results from work-based learning, consists of three components (knowledge, practical skills and work experience) and has an external summative assessment.

National Qualifications Framework (NQF)

The comprehensive system approved by the Minister of Higher Education and Training for the classification, co-ordination, registration and publication of articulated and quality-assured national qualifications. The South African NQF is a singled integrated system comprising three coordinated qualifications sub-frameworks for: General and Further Education and Training; Higher Education; and Trades and Occupations.

Occupational qualification document

The QCTO methodology document that defines the learning required to be competent to practise an occupation or occupational specialisation.

Qualification

A planned combination of learning outcomes which has a defined purpose or purposes, intended to provide qualifying learners with applied competence and a basis for further learning and which has been assessed in terms of exit level outcomes, registered on the NQF and certified and awarded by a recognised body.

Qualification type

The classification of a qualification within a sub-framework of the NQF.

QC

One of the three Quality Councils established to develop and manage each of the sub-frameworks of the NQF: CHE for the HEQSF; Umalusi for the GFETQSF; QCTO for the OQSF.



QCTO

The Quality Council for Trades and Occupations established in terms of the NQF Act of 2008. It is tasked to achieve the objectives of the NQF and to develop and manage the Occupational Qualifications Sub- Framework (OQSF).

RPL

The principles and processes through which the prior knowledge and skills of a person are made visible, mediated and assessed for the purposes of alternative access and admission, recognition and certification, or further learning and development.

SETA

A body established in terms of the Skills Development Act to develop and implement sector skills plans and promote learning programmes, including workplace leaning. The QCTO has delegated quality assurance powers to the SETAs.

SAQA

The statutory authority established in terms of the NQF Act of 2008 (which replaced the SAQA Act of 1995) to oversee the further development and implementation of the NQF, the achievement of the objectives of the NQF, and the coordination of the three sub- frameworks.

Sub-framework of the NQF

One of three coordinated qualification sub-frameworks which make up the NQF as a single integrated system: the Higher Education Qualifications Sub-Framework, the General and Further Education and Training Sub-Framework and the Occupational Qualifications Sub- Framework.

Trade

An occupation for which an artisan qualification and relevant trade test is required in terms of the Skills Development Act. SETAs are required to apply to NAMB to have an occupation listed as a trade.

Workplace-based learning

The exposure and interactions required to practice the integration of knowledge, skills and attitudes required in the workplace.