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DESA TVET & WORKFORCE DEVELOPMENT PROGRAMME

TRAIN AND CERTIFY A FUTURE-READY WORKFORCE FOR FIBER DEPLOYMENT, DEVICE SERVICES, DATA OPERATIONS, AND LOCAL APP DEVELOPMENT.

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DESA TVET & Workforce Development Programme

Programme Fact Sheet

Item	Details
Programme Title	DESA TVET & Workforce Development Programme
Acronym	DTVET
Mission Statement	Train and certify a future-ready workforce for fiber deployment, device services, data operations, and local app development.
Executive Summary	DTVET is a strategic instrument under DESA, designed to operationalize workforce readiness for digital infrastructure and service ecosystems. It institutionalizes vocational training and certification pathways for fiber optics, network engineering, cybersecurity, and applied digital services, ensuring inclusive participation of women and youth. The programme aligns with Agenda 2063, Agenda 2074, AfDB High 5 priorities, and regional strategies (COMESA, EAC, SADC), positioning partner countries to achieve sustainable connectivity and market activation.

Executive Summary

The DESA TVET & Workforce Development Programme (DTVET) is established as a sovereign, vocationally oriented initiative under the DESA architecture, mandated to equip national workforces with the technical and operational competencies required for fiber deployment, device servicing, data operations, and local application development. DTVET addresses a critical structural gap in digitalisation strategies: the absence of certified, locally trained technicians capable of sustaining broadband infrastructure and associated services without reliance on external contractors.

The programme is conceived as a multi-tiered capacity-building instrument, integrating curricula for fiber trenching and splicing, network engineering, MLOps essentials, cybersecurity, and service management. It institutionalizes certification pathways through TVET colleges and polytechnics, reinforced by a National Skills Compact and inclusion targets for women and youth. By embedding DTVET within DESA's governance framework, Creativa Center ensures that workforce development becomes a permanent feature of national development systems, aligned with continental and regional priorities.

Strategically, DTVET advances the Second Ten-Year Implementation Plan (2024–2033) of Agenda 2063, operationalizes AfDB's High 5 priorities—particularly *Industrialize Africa* and *Improve Quality of Life*—and harmonizes with COMESA's digitalisation strategy and Agenda for Social Equity 2074. Its outcomes include thousands of certified technicians, domestic maintenance capacity, and measurable reductions in service costs, thereby enhancing national competitiveness and social equity.

Chapter 1: Programme Title and Acronym

The programme shall be formally designated as the DESA TVET & Workforce Development Programme, hereinafter referred to by its acronym DTVET. This designation shall be codified under the DESA Institutional Governance Manual and recognized as a core instrument for operationalizing digital infrastructure readiness and workforce activation across all DESA units, commencing with SUDESA in South Sudan as the pilot implementation.

Chapter 2: Legal Mandate and Purpose

DTVET is instituted under the binding authority of the DESA Charter and the Institutional Governance Manual, with compulsory status for all DESA deployments involving broadband infrastructure and digital service ecosystems. Its legal mandate encompasses the following dimensions:

- **Alignment with Continental and Regional Frameworks**: DTVET operationalizes the objectives of Agenda 2063: Second Ten-Year Implementation Plan (2024–2033), reinforces AfDB's High 5 priorities (*Industrialize Africa*, *Integrate Africa*, *Improve Quality of Life*), and harmonizes with COMESA's digitalisation strategy and regional TVET policies under EAC and SADC.
- **Normative Integration with Agenda 2074**: The programme embeds principles of social equity, gender inclusion, and universal access, ensuring that vocational training pathways are accessible to women, youth, and persons with disabilities.
- **Institutional Purpose**: DTVET is designed to institutionalize technical competencies for fiber deployment, device servicing, and applied digital operations within national education and labor systems. It establishes certification standards recognized by regional bodies, thereby creating a portable credential framework that enhances workforce mobility and market competitiveness.

The programme's legal sufficiency is secured through formal adoption by national DESA steering committees, codification in operating circulars, and co-endorsement by regional authorities and development partners, including AfDB and COMESA.

Chapter 3: Strategic Objectives

The strategic orientation of the DESA TVET & Workforce Development Programme (DTVET) is grounded in the imperative to institutionalize technical competencies as a structural enabler of digitalisation and inclusive economic growth. While continental and regional strategies emphasize broadband expansion and digital service ecosystems, these ambitions remain contingent upon the availability of a skilled workforce capable of deploying, maintaining, and optimizing such infrastructure. DTVET addresses this systemic gap by embedding vocational training and certification pathways within national education and labor frameworks, thereby ensuring sustainability and reducing dependency on external contractors.

The programme's objectives are defined to advance governance, education, market activation, and social equity in a manner consistent with Agenda 2063, Agenda 2074, AfDB High 5 priorities, and COMESA's digitalisation strategy. These objectives are operational rather than aspirational, designed to produce measurable outcomes in workforce readiness, institutional capacity, and economic competitiveness.

Objective 1: Institutionalization of Workforce Development
DTVET seeks to transform vocational training from an episodic intervention into a permanent institutional function. This entails embedding fiber optics, network engineering, and applied digital service curricula within TVET colleges, polytechnics, and accredited training centers, supported by national policy instruments such as the National Skills Compact. By codifying these standards under DESA governance, the programme ensures continuity beyond initial funding cycles and aligns workforce development with long-term national planning frameworks.

Objective 2: Inclusive Access and Gender Equity
The programme institutionalizes inclusion as a normative requirement, setting binding targets for the participation of women, youth, and persons with disabilities in all training cohorts. Accessibility features—such as adaptive learning interfaces and assistive technologies—shall be integrated into curricula and delivery platforms, ensuring compliance with universal design principles and reinforcing the social equity commitments of Agenda 2074.

Objective 3: Market Activation and SME Enablement
DTVET is designed not merely as a training initiative but as a structural catalyst for market activation. By equipping technicians with competencies in fiber deployment, device servicing, and applied digital operations, the programme enables small and medium-sized enterprises (SMEs) to participate in the digital economy as service providers, subcontractors, and innovators. This objective reinforces national competitiveness by reducing reliance on foreign contractors, lowering service costs, and creating domestic value chains for broadband and digital services.

Objective 4: Domestic Maintenance and Sustainability
The programme institutionalizes domestic maintenance capacity as a sovereign function. Fiber networks and associated digital infrastructure require continuous upkeep, troubleshooting, and optimization. DTVET ensures that these functions are performed by certified local technicians, thereby safeguarding service continuity, minimizing downtime, and reducing fiscal leakage associated with external vendor dependency. This objective is critical for sustaining the operational integrity of DESA's digitalisation agenda and for embedding resilience within national systems.

Strategic Alignment Table

DTVET Objective	**Agenda 2063**	**AfDB High 5**	**Regional Strategies (COMESA/EAC/SADC)**
Institutionalization of Workforce Development	Aspiration 1: A prosperous Africa based on inclusive growth	*Industrialize Africa*, *Improve Quality of Life*	COMESA Digitalisation Strategy: Skills pillar
Inclusive Access and Gender Equity	Aspiration 6: People-driven development	*Improve Quality of Life*	SADC TVET Framework; EAC Skills Compact
Market Activation and SME Enablement	Aspiration 2: Integrated continent	*Integrate Africa*, *Industrialize Africa*	COMESA IDEA Programme; Regional SME policies
Domestic Maintenance and Sustainability	Aspiration 10: Africa as a strong, resilient partner	*Improve Quality of Life*	COMESA Infrastructure Harmonisation

Objective 5: Innovation and Local Application Development
DTVET extends beyond infrastructure deployment to foster innovation ecosystems at the local level. By integrating modules on mobile application development, service management, and data operations, the programme empowers graduates to create context-specific digital solutions for education, health, agriculture, and commerce. This objective positions vocational training as a driver of indigenous innovation, enabling communities to leverage connectivity for socio-economic transformation rather than mere consumption of imported technologies.

Advancing Governance, Education, and Social Equity
The strategic objectives of DTVET collectively advance governance by institutionalizing technical standards and reducing fiscal leakage through domestic maintenance capacity. They strengthen education by embedding applied digital competencies within national TVET systems, ensuring that curricula reflect market realities and technological trends. Social equity is reinforced through binding inclusion targets and accessibility mandates, guaranteeing that women, youth, and persons with disabilities participate fully in the digital economy.

From a governance perspective, the programme enhances state capability to manage broadband infrastructure as a sovereign asset, reducing dependency on external contractors and mitigating associated risks. In education, DTVET operationalizes the principle of lifelong learning by creating pathways from foundational technical literacy to advanced certification, thereby aligning vocational training with national development agendas. Social equity is not treated as an ancillary consideration but as a structural feature of programme design, embedded in admission policies, curriculum delivery, and certification frameworks.

Economic Impact Narrative
The cumulative effect of these objectives is measurable in terms of job creation, cost efficiency, and national competitiveness. By training and certifying thousands of technicians, DTVET reduces the average cost of fiber deployment and maintenance by an estimated 25–40 percent compared to reliance on foreign contractors. Domestic capacity for device servicing and data operations minimizes service downtime, improves user experience, and accelerates adoption of digital services across sectors. These outcomes translate into enhanced productivity for SMEs, increased fiscal resilience for governments, and expanded access to affordable connectivity for citizens—consistent with the structural transformation goals of Agenda 2063 and the normative commitments of Agenda 2074.

Summary of Strategic Objectives and Expected Outcomes

Objective	Expected Outcome	Indicative KPI
1. Institutionalization of Workforce Development	Permanent integration of fiber and digital service curricula in TVET systems	Number of accredited TVET institutions; curricula adoption rate
2. Inclusive Access and Gender Equity	Increased participation of women, youth, and persons with disabilities in training	% female enrollment; % youth enrollment; accessibility compliance score

Objective	Expected Outcome	Indicative KPI
3. Market Activation and SME Enablement	SMEs engaged as certified service providers and subcontractors	Number of SMEs certified; documented cost savings in service delivery
4. Domestic Maintenance and Sustainability	Reduced reliance on external contractors; improved service continuity	% reduction in foreign contractor expenditure; network uptime metrics
5. Innovation and Local Application Development	Development of locally relevant apps and digital solutions for key sectors	Number of apps developed; adoption rate in education, health, agriculture

Analytical Linkage to M&E Framework

These objectives and outcomes shall be codified within the DESA Monitoring, Evaluation, and Learning (MEL) system, ensuring quarterly reporting and public disclosure through the unified dashboard. KPI families will be harmonized with Agenda 2063 indicators and AfDB High 5 targets, enabling cross-walks to continental and regional development agendas. Independent audits will validate compliance with inclusion mandates, accessibility standards, and cost-efficiency benchmarks.

Chapter 4: Institutional Architecture and Governance

The governance architecture of DTVET is designed to ensure institutional legitimacy, operational accountability, and compliance with ethical and regulatory standards. It establishes a multi-tiered structure that integrates oversight, implementation, and certification functions within the broader DESA governance system, while maintaining alignment with national laws, regional protocols, and international best practices.

Central Oversight

The DESA Central Unit shall serve as the supreme governing authority for DTVET, responsible for policy formulation, standard-setting, and accreditation. It shall maintain direct accountability to the Creativa Center Board and operate under the provisions of the Institutional Governance Manual. The Central Unit shall also coordinate strategic partnerships with continental and regional bodies, including the African Development Bank (AfDB), the African Union Commission (AUC), and the Common Market for Eastern and Southern Africa (COMESA).

National Implementation Units

Each DESA country-level entity (e.g., SUDESA, NADESA) shall establish a DTVET Implementation Unit under its national steering committee. This unit shall be responsible for programme execution, localization of curricula, procurement of training equipment, and coordination with ministries, universities, and private sector actors. It shall report to the DESA Central Unit through quarterly compliance and performance reviews.

Advisory Board

A DTVET Advisory Board shall be constituted to provide strategic guidance and technical validation. Membership shall include representatives from AfDB, COMESA, national governments, academia, and

private sector partners. The Advisory Board shall convene biannually to review progress, approve major policy adjustments, and validate compliance with inclusion and accessibility standards.

Compliance Mechanisms
All governance instruments shall be codified under the DESA Institutional Governance Manual. Compliance shall be enforced through quarterly reporting, independent audits, and public disclosure of performance metrics via the DESA Monitoring and Evaluation (M&E) dashboard. Non-compliance shall trigger corrective action protocols, including suspension of certification privileges and reallocation of funding.

Chapter 5: Implementation Framework

The implementation framework of DTVET is structured around a three-tier model—Infrastructure, Application, and Capacity—sequenced across three phases: Initiation, Scale-Up, and Consolidation. This design ensures operational feasibility, legal sufficiency, and measurable impact.

Three-Tier Model

- **Infrastructure Tier**: Establishment of physical and digital infrastructure for training delivery, including fiber deployment labs, device servicing stations, and simulation environments for network engineering.
- **Application Tier**: Integration of curricula into TVET institutions and polytechnics, supported by digital learning platforms and adaptive interfaces for accessibility.
- **Capacity Tier**: Development of trainer pipelines, certification pathways, and institutional accreditation mechanisms to ensure sustainability and scalability.

Sequencing Phases

- **Phase 1: Initiation (Months 0–6)**
  Legal adoption of DTVET by national steering committees; baseline assessments; procurement of training equipment; accreditation of initial training institutions.
- **Phase 2: Scale-Up (Months 6–18)**
  Deployment of curricula across TVET networks; establishment of fiber deployment labs; certification of first cohorts; integration of accessibility features and inclusion targets.
- **Phase 3: Consolidation (Months 18–36)**
  Institutionalization of DTVET as a permanent function within national education systems; creation of regional hubs for shared services; formalization of cost-recovery mechanisms through advanced certification tiers.

Operational Safeguards
All phases shall incorporate compliance with DESA standards on ethics, inclusion, and affordability. Tariff safeguards shall be applied to prevent cost escalation in training delivery, and affordability targets shall be monitored through the unified M&E system.

Chapter 6: Fiduciary Architecture and Financing Instruments

The financial architecture of DTVET is designed to ensure adequacy of resources, predictability of funding flows, and long-term sustainability beyond the initial implementation horizon. It establishes a blended finance model anchored in the DESA Development Fund and complemented by second-lien

participation from development finance institutions (DFIs), private sector co-financing, and cost-recovery mechanisms.

Financing Principles
DTVET financing shall adhere to the following principles:

- **Transparency and Accountability**: All financial transactions shall be subject to audit and disclosure under DESA fiduciary standards and AfDB safeguard policies.
- **Diversification of Sources**: Funding shall be drawn from multiple streams to mitigate dependency risk and ensure resilience against fiscal shocks.
- **Value for Money**: Procurement and operational expenditures shall prioritize cost-efficiency without compromising quality or compliance.
- **Alignment with Development Objectives**: Financing instruments shall reinforce Agenda 2063, AfDB High 5 priorities, COMESA digitalisation strategy, and Agenda 2074 goals.

Sources of Financing
- **DESA Development Fund**: Primary source of financing for DTVET under its digitalisation and capacity-building portfolio.
- **African Development Bank (AfDB)**: Second-lien financier providing concessional loans, grants, and technical assistance through sector-specific windows.
- **Private Sector Co-Financing**: Strategic partnerships with telecom operators, technology providers, and agribusinesses for in-kind contributions (equipment, software licenses) and internship stipends.
- **Development Finance Institutions and Donors**: Additional resources mobilized for inclusion components targeting women and persons with disabilities.
- **Cost-Recovery Mechanisms**: Revenue streams generated through tuition and certification fees for advanced tiers of training, structured to ensure affordability while contributing to programme sustainability.

Tariff Safeguards and Affordability Targets
Training fees and certification costs shall be regulated under DESA affordability benchmarks to prevent exclusion of vulnerable groups. Subsidies and scholarship schemes shall be instituted for women, youth, and persons with disabilities, financed through donor contributions and CSR allocations.

Chapter 7: Compliance and Ethics

DTVET shall operate under a codified set of compliance and ethical standards, ensuring that all programme activities adhere to principles of fairness, transparency, and accountability. These standards are binding and enforceable under the DESA Institutional Governance Manual.

Legal Bases
Compliance obligations derive from national laws, regional protocols (COMESA, EAC, SADC), and international best practices on vocational training, data governance, and inclusion. All instruments shall be harmonized with AfDB safeguard policies and Agenda 2074 normative principles.

Data Protection and Privacy
All digital learning platforms and certification registries shall comply with national data protection laws and regional interoperability standards. Encryption, role-based access controls, and audit trails shall be enforced to safeguard privacy and prevent unauthorized use.

Algorithmic Transparency and Accessibility
Adaptive learning systems and digital assessment tools deployed under DTVET shall incorporate explainability features and accessibility standards aligned with WCAG guidelines. Bias audits shall be conducted prior to deployment to prevent discriminatory outcomes.

Grievance Redress and Audit Obligations
A formal grievance redress mechanism shall be established at both national and regional levels, enabling trainees, trainers, and partner institutions to report compliance breaches. Independent audits shall be conducted annually to validate adherence to ethical, financial, and accessibility standards, with findings disclosed through the DESA Monitoring and Evaluation dashboard.

Chapter 8: Regional Replication and Integration

The regional replication and integration design of DTVET establishes a legally coherent, operationally feasible, and ethically compliant pathway for cross-border adoption within COMESA, EAC, and SADC. The programme shall be harmonised with existing regional strategies and instruments to ensure mutual recognition of credentials, interoperability of training standards, and portability of skilled labour across participating jurisdictions.

DTVET will be anchored in the COMESA digitalisation agenda, including programme work under the Inclusive Digitalisation of Eastern and Southern Africa (IDEA) framework and the COMESA Medium-Term Strategic Plan. These instruments emphasise capacity building, affordable connectivity, trusted data platforms, and digitally enabled services. DTVET will translate these policy orientations into structured vocational pipelines, institutional accreditation, and shared service arrangements through DESA regional hubs. Within EAC and SADC, DTVET shall align its certification architecture with regional qualifications recognition practices and relevant TVET policy frameworks to facilitate labour mobility and standardised assessment protocols across national boundaries.

Replication shall proceed through the DESA hub-and-spoke model. Regional hubs (for example, Lusaka, Juba, Windhoek) will host shared training infrastructure for fiber deployment laboratories, device service studios, and simulated network environments, together with a consolidated registry of accredited trainers and institutions. National DESA units will operate as spokes, localising curricula and delivering cohorts while drawing on pooled procurement, cross-border faculty exchanges, and joint examinations overseen by the DESA Central Unit.

Portability of credentials will be guaranteed through a unified DTVET Certification Register managed by DESA and co-endorsed by national authorities and, where applicable, the COMESA Secretariat. The register will provide secure, verifiable records for employers, academic institutions, and development partners. Interoperability will be further enforced by a common curriculum map, examination blueprints, proctoring standards, and assessor codes, thereby enabling trainees to complete modules across borders without loss of standing or duplication of effort.

Knowledge management will be institutionalised through a regional repository of lesson plans, lab protocols, accessibility conformance statements, and case studies on market activation. The repository will serve ministries, TVET colleges, polytechnics, and private sector partners and will be subject to

periodic peer review and audit. Shared infrastructure shall include cloud-hosted learning platforms with accessibility features, cross-border internship rosters, and an instructor exchange system with minimum service terms and code of conduct provisions.

Compliance will be enforced through quarterly reporting by national DTVET units to the DESA Central Unit, biannual advisory board reviews with regional representation, and independent audits of ethical, financial, and accessibility standards. Data protection obligations will be aligned to national laws and harmonised regional protocols; cross-border data exchange will be permitted only under validated standards and recorded in audit trails. Inclusion safeguards will remain binding, with participation targets for women and youth codified in operating circulars and monitored by the unified DESA MEL system.

In effect, DTVET constitutes a replicable, interoperable instrument that converts regional policy commitments into vocational realities, enabling labour mobility, cost efficiency, and sustained maintenance capacity for digital infrastructure across COMESA, EAC, and SADC.

Chapter 9: Programme Benefits and Economic Rationale

The economic rationale for DTVET is founded on the conversion of policy intent into measurable structural outcomes: certified technical cohorts, domestic maintenance capacity, market activation for SMEs, and documented reductions in cost and downtime across broadband and digital service ecosystems. By embedding workforce development as a permanent function within national education and labour systems, DTVET creates a durable mechanism for lowering fiscal leakage associated with external contractors, accelerating service availability, and expanding equitable access to digital services.

Job creation arises from direct training throughput, subcontracting for trenching and splicing, device servicing markets, and ancillary roles in logistics, safety, and quality assurance. The programme enables SMEs to engage as certified service providers, generating local value chains around fiber deployment, customer premises equipment (CPE) installation, and campus network upkeep. Domestic maintenance capacity reduces mean-time-to-repair and improves network uptime, which, in turn, raises utilisation of education, health, and commerce platforms, increasing productivity across the economy.

Cost savings are realised through pooled procurement of training equipment and consumables, standardised methods that reduce rework and failure rates, and replacement of foreign contractor mark-ups with domestic labour priced under national wage frameworks. Service efficiency gains are evidenced by shorter installation lead times, improved throughput in TVET labs and field crews, and higher compliance with accessibility standards, ensuring broader adoption and sustained use by women, youth, and persons with disabilities.

The cumulative effect is enhanced national competitiveness: affordable, reliable connectivity reduces transaction costs for firms; inclusive participation expands the effective labour pool; and locally developed applications and services deepen sectoral digitisation in agriculture, health, and education. These channels support Agenda 2063's Second Ten-Year Implementation Plan emphasis on innovation, skills, and quality of life, the AfDB High 5 priorities—*Industrialize Africa*, *Integrate Africa*, and *Improve Quality of Life*—and COMESA's digitalisation pillars for interoperable platforms and knowledge transfer.

To facilitate Monitoring & Evaluation and fiduciary due diligence, the following compact table sets out the principal benefit channels, measurement logic, and indicative indicators. Country appendices will

populate baseline and target values in line with national planning instruments and DESA MEL requirements.

Benefit Channel	Economic Mechanism	Measurement Logic	Indicative Indicator
Certified workforce cohorts	Expanded domestic supply of technicians across fiber, devices, data ops, and app dev	Annual graduates × certification rate; employment placement within 6–12 months	Number certified; % placed; % women/youth certified
Reduced reliance on external contractors	Replacement of imported services with domestic capacity	Share of maintenance spend domestic vs foreign; contractor expenditure trend	% reduction in foreign contractor spend; cost per km deployed
Network uptime and service efficiency	Shorter repair cycles; preventive maintenance; standardised methods	Mean-time-to-repair (MTTR); scheduled maintenance adherence; uptime logs	MTTR reduction; uptime %; SLA compliance rate
SME market activation	Local subcontracting and service portfolios; application of certified methods	Number of SMEs certified; revenue growth of participating SMEs; repeat service contracts	SME count; revenue growth %; contract renewal rate
Cost savings in deployment/maintenance	Method standardisation; pooled procurement; labour substitution	Unit cost benchmarks vs baseline; rework rates; consumable wastage	Cost reduction %; rework rate %; wastage %
Inclusion and accessibility outcomes	Binding participation targets; accessible delivery platforms	Cohort composition; WCAG conformance; beneficiary feedback	% women/youth; accessibility score; satisfaction index
Sectoral productivity effects	Increased digital service utilisation in education, health, agriculture, commerce	Platform usage analytics; sector throughput; time-to-service	Utilisation growth %; throughput gains; time-to-service

These benefits will be disclosed through quarterly reports and the annual public performance bulletin under DESA's unified MEL system. Independent audits will validate data integrity, inclusion safeguards, accessibility conformance, and cost-efficiency benchmarks. The monetisation of benefits—particularly contractor substitution and uptime-linked productivity—will be undertaken in country appendices using verified baseline data and documented unit costs under the DESA fiduciary architecture.

Chapter 10: Measurement, Reporting, and Verification (MRV)

The MRV framework for DTVET is established as a binding instrument to ensure transparency, accountability, and continuous performance improvement. It is designed to measure compliance with

programme objectives, validate alignment with continental and regional development agendas, and provide evidence-based insights for decision-making at both national and regional levels.

Purpose and Principles
The MRV framework serves three primary purposes:

1. **Performance Measurement**: To assess the extent to which DTVET achieves its stated objectives in workforce development, market activation, and inclusion.
2. **Compliance Assurance**: To verify adherence to ethical standards, accessibility obligations, and fiduciary safeguards.
3. **Strategic Alignment**: To ensure that DTVET contributes to Agenda 2063, AfDB High 5 priorities, and COMESA digitalisation strategy, while embedding the normative principles of Agenda 2074.

The framework shall operate under the unified DESA Monitoring, Evaluation, and Learning (MEL) system, guided by principles of objectivity, independence, and data integrity.

Key Performance Indicator (KPI) Families
KPIs shall be structured across five dimensions:

- **Capacity Development**: Number of individuals certified under foundational, applied, and advanced tiers; number of accredited institutions; trainer pipelines established.
- **Institutional Integration**: Number of TVET institutions delivering DTVET curricula; operational fiber deployment labs; compliance with accessibility standards.
- **Market Activation**: Number of SMEs certified; documented cost savings; service efficiency improvements.
- **Inclusion and Accessibility**: Participation rates for women and youth; accessibility compliance scores; beneficiary feedback.
- **Strategic Impact**: Contribution to Agenda 2063 indicators; alignment with AfDB High 5 targets; regional interoperability achieved within COMESA corridors.

Reporting Cadence

- **Quarterly Reports**: Submitted by national DTVET units to the DESA Central Unit, covering KPIs, compliance status, and corrective actions.
- **Biannual Advisory Board Reviews**: Validation of progress and strategic alignment.
- **Annual Public Performance Report**: Disclosure of aggregated results on DESA's unified MEL dashboard, cross-referenced with Agenda 2063 and AfDB reporting frameworks.

Verification and Audit
Independent audits shall validate data integrity, ethical compliance, and accessibility conformance. Findings shall be disclosed publicly and integrated into corrective action plans where necessary.

Chapter 11: Stakeholder Engagement and Capacity Building

DTVET's success depends on structured engagement with a broad spectrum of stakeholders, including government ministries, academic institutions, private sector actors, civil society, and development partners. Engagement shall be institutionalised through formal instruments such as Memoranda of Understanding (MoUs), Operating Circulars, and partnership protocols.

Government Engagement

Prime ministries, ministries of education, ICT, and labour shall serve as primary custodians of DTVET implementation. Their responsibilities include policy adoption, budget allocation, and integration of DTVET standards into national education frameworks.

Academic Institutions

TVET colleges, polytechnics, and universities shall deliver DTVET curricula under accreditation by the DESA Central Unit. Faculty enablement programmes and Train-the-Trainer pipelines shall be established to ensure sustainability and local ownership.

Private Sector

Telecom operators, technology providers, and SMEs shall participate as co-financiers, internship hosts, and market activation partners. Their engagement shall be governed by operating circulars specifying compliance with DESA standards on ethics, inclusion, and affordability.

Civil Society and Inclusion Networks

Civil society organisations and disability advocacy groups shall be integrated into programme design and monitoring processes to ensure accessibility and equitable participation.

Capacity Building Tracks

Capacity building shall be structured into three tracks:

- **Technical Track**: Fiber deployment, device servicing, network engineering, cybersecurity.
- **Digital Services Track**: Data operations, service management, local app development.
- **Governance and Compliance Track**: Ethical standards, accessibility protocols, fiduciary safeguards.

Certification pathways shall be tiered and portable across jurisdictions, ensuring recognition by regional bodies and development partners.

Chapter 12: Participation and Partnership Framework

The participation and partnership framework for DTVET is instituted as a binding instrument under the DESA Institutional Governance Manual. It establishes the legal basis, operating conditions, and compliance obligations applicable to all counterparties engaging in programme delivery, financing, and oversight. Participation is open to sovereign authorities, accredited TVET institutions, private sector entities, civil society organisations, and development partners, subject to formal entry instruments and periodic performance verification.

Entry Instruments and Legal Sufficiency. Each participant's entry is formalised through Memoranda of Understanding, Operating Circulars, and, where appropriate, service-level agreements. MoUs define the scope of cooperation, data sharing arrangements, inclusion commitments, and dispute resolution. Operating Circulars codify procedural obligations, accreditation criteria, examination and proctoring

standards, accessibility requirements, and cost-control provisions. Service-level agreements govern delivery metrics for training cohorts, lab operation, equipment maintenance, and student support services. Instruments shall be executed by authorised representatives and registered with the national DESA steering committee and the DESA Central Unit for compliance monitoring.

Eligibility and Accreditation. Eligibility requires demonstrated institutional capacity, financial probity, and commitment to inclusion targets for women and youth. TVET colleges, polytechnics, and universities must undergo accreditation based on curriculum conformity, instructor qualifications, lab adequacy for fiber deployment and device servicing, accessibility conformance, and secure data handling. Private sector participants shall demonstrate technical competence, lawful standing, and adherence to ethical and affordability safeguards. Accreditation may be suspended for non-compliance with DESA standards on inclusion, data governance, and fiduciary reporting.

Compliance and Reporting. All participants are subject to quarterly compliance reports submitted to the DESA Central Unit, biannual advisory board reviews, and independent audits addressing financial stewardship, accessibility, and performance integrity. Public disclosure is effected through the unified DESA Monitoring, Evaluation, and Learning dashboard, enabling verification by stakeholders and development partners.

Partnership Calls to Action. DTVET invites sovereign investors, DFIs, and technology partners to enter binding cooperation aligned with Agenda 2063, AfDB High 5 priorities, COMESA digitalisation strategy, and Agenda 2074. DFIs and sovereign funds may participate through second-lien concessional financing, grant windows for accessibility components, and results-based instruments linked to verified cohort certification and maintenance outcomes. Telecom operators and OEMs may provide co-financing, equipment, cloud credits, and internship placements under affordability and open-standards commitments. Civil society partners shall co-design inclusion pathways and grievance redress mechanisms, participate in audits, and contribute to accessibility scoring and remediation.

Instrument Summary (for ease of adoption).

Instrument	Purpose	Core Clauses
Memorandum of Understanding	Legal basis for cooperation and scope delineation	Roles and responsibilities; data exchange; inclusion commitments; dispute resolution; termination
Operating Circular	Binding procedural and technical standards	Accreditation criteria; curricula and exams; accessibility obligations; cost-control; reporting and audits
Service-Level Agreement	Delivery metrics for training and labs	Throughput targets; equipment maintenance; uptime; student support; corrective action
Affordability Undertaking	Tariff safeguards and scholarship commitments	Fee caps; subsidies for women/youth/disabled; disclosure of cost structures
Data Governance Addendum	Privacy, security, and cross-border interoperability	Encryption; role-based access; audit trails; regional standards alignment (COMESA/EAC/SADC)

Chapter 13: Capacity Chapter — Expected Data Transfer (Juba Pilot: One Million Users)

This chapter provides the quantitative justification for fiber deployment as an enabling infrastructure, using Juba and a one-million-user reference case. The methodology combines (i) continental usage baselines from recognised industry reports, (ii) activity-based estimates for education, communication, and service ecosystems, and (iii) peak-hour concurrency calculations to determine backhaul and metro fiber needs.

Methodological Benchmarks. Mobile data consumption in Sub-Saharan Africa, while the lowest globally, is rising rapidly. Recent Ericsson mobility analyses and secondary briefs report current averages around 5–7 GB per smartphone per month, with trajectories toward 12–17 GB by 2030 depending on sub-region and scenario, underscoring the latent demand that fiber unlocks. Concurrently, ITU assessments note persistent affordability and usage gaps, particularly in rural areas, strengthening the case for cost-efficient, high-capacity infrastructure and inclusive pricing models.

Activity-Specific Data Use (Indicative Benchmarks). Streaming platforms disclose data intensity of video delivery: Netflix indicates ~1 GB/hour in SD, 3 GB/hour in HD, and up to ~7 GB/hour in UHD; YouTube's technical guidance for ingest/playout bitrates implies comparable ranges for 480p–1080p. Typical enterprise collaboration requires sustained throughput—Microsoft Teams HD group video commonly operates around ~2 Mbps per stream, with standard ranges published across technical notes and operations guidance. Consumer voice communications over IP are comparatively light; measured WhatsApp voice calls average ~0.7 MB/minute, while WhatsApp video can reach ~1 Mbps under favourable conditions.

Scenario Results (One Million Users; Monthly and Annual Totals). Using the above benchmarks and a conservative distribution of activities, we compute four scenarios. Calculations are provided programmatically and are available for audit. (All conversions use 1 TB = 1024 GB; 1 PB = 1024 TB.)

Scenario	Assumption (GB per user per month)	Monthly Total	Annual Total
Baseline (SSA present-day)	6.7 GB	**≈ 6.39 PB**	**≈ 76.68 PB**
Activation (post-fiber, moderate)	20 GB	**≈ 19.07 PB**	**≈ 228.88 PB**
Full Utilisation (education + updates)	50 GB	**≈ 47.68 PB**	**≈ 572.20 PB**
Activity-based Moderate	~39.22 GB	**≈ 37.40 PB**	**≈ 448.85 PB**

Computation reference: internal calculations executed via programme code.

The activity-based case assumes per-user daily consumption of 45 minutes SD video (~0.75 GB), 20 minutes Teams group video (~2 Mbps; ≈ 0.30 GB), 20 minutes WhatsApp voice (~0.014 GB), plus 0.25 GB for social/app updates; ~1.31 GB/day translates to ~39.2 GB/month.

Peak-Hour Concurrency (Backhaul Dimensioning). For capacity planning, the following conservative concurrency yields an indicative ~90 Gbps aggregate demand: 5% of users concurrently streaming SD at ~1 Mbps (~50 Gbps), 1% concurrently in HD at ~3 Mbps (~30 Gbps), and 0.5% concurrently in

enterprise video collaboration at ~2 Mbps (~10 Gbps). These values corroborate the necessity of fiber backbones and metro rings, with redundancy and Quality-of-Service policies to maintain service continuity during peaks and incident response.

Economic and Policy Implications. The foregoing volumes, when mapped against ITU affordability diagnostics and regional digitalisation strategies, underscore that fiber optics are indispensable to realise inclusive digital service ecosystems—education streaming, telemedicine triage, e-commerce, and government portals—while keeping unit costs within affordability targets and avoiding congestion externalities that disproportionately exclude low-income users. DTVET therefore frames fiber deployment as a prerequisite for workforce activation: without sufficient backhaul and last-mile capacity, certified cohorts cannot be absorbed at scale, SME subcontracting cannot flourish, and the social equity mandates of Agenda 2074 cannot be operationalised.

Closing Statement

The DESA TVET & Workforce Development Programme (DTVET) is hereby affirmed as a sovereign, ethical, and scalable instrument for operationalising inclusive digitalisation across partner jurisdictions. It binds together vocational training, institutional capacity building, and market activation under a unified governance architecture, ensuring that workforce development is not an episodic intervention but a permanent structural feature of national education and labour systems.

DTVET advances the strategic imperatives of Agenda 2063: Second Ten-Year Implementation Plan (2024–2033) by converting policy aspirations into measurable outcomes—certified technical cohorts, domestic maintenance capacity, and documented reductions in service costs. It reinforces the AfDB High 5 priorities, particularly *Industrialize Africa*, *Integrate Africa*, and *Improve Quality of Life*, through the creation of skilled labour pools capable of sustaining broadband infrastructure and enabling digital service ecosystems. Regionally, DTVET harmonises with the COMESA digitalisation strategy, embedding interoperability, shared services, and knowledge transfer within a legally coherent framework that guarantees portability of credentials and compliance with accessibility standards.

From an economic perspective, DTVET constitutes a bankable proposition for development finance institutions, sovereign investors, and private sector partners. Its fiduciary architecture—anchored in the DESA Development Fund and complemented by blended finance instruments—ensures transparency, predictability, and sustainability. Independent audits, quarterly compliance reports, and public disclosure through the DESA Monitoring and Evaluation dashboard institutionalise accountability and safeguard against fiduciary and operational risks.

From a social equity perspective, DTVET enforces binding inclusion targets for women, youth, and persons with disabilities, codified in operating circulars and verified through accessibility audits. These provisions are not ancillary but structural, ensuring that digitalisation does not replicate exclusionary patterns but instead expands opportunity and participation across all demographic cohorts.

In formal terms, DTVET is secured by the DESA Institutional Governance Manual and the standards herein—ethical compliance, data governance, accessibility, and affordability—together with a tiered certification regime co-endorsed by national authorities and regional bodies. Its adoption constitutes a strategic commitment to Africa's decade of accelerated implementation, transforming policy intent into institutional competence and measurable socio-economic gains within a regional system designed for interoperability, resilience, and inclusive growth.

Accordingly, DTVET is positioned as a cornerstone of DESA's long-term vision: a future-ready workforce enabling sovereign digital infrastructure, inclusive service ecosystems, and equitable market participation—consistent with the normative principles of Agenda for Social Equity 2074 and the operational priorities of continental and regional development frameworks.