**Initial Feasibility & Technology Assessment Report**

**Project:** Smart 5G Optimization & Deployment – Safaricom

**A. Executive Summary**

This report evaluates the **technical feasibility**, **integration readiness**, and **operational risks** of deploying Smart 5G across urban and rural nodes in Kenya. It also reviews the maturity of 5G technologies, spectrum availability, and network integration with existing 4G and cloud-native infrastructure.

**B. Technology Landscape Evaluation**

| **Component** | **Assessment** | **Technology Choice** | **Notes** |
| --- | --- | --- | --- |
| **Radio Access (RAN)** | Feasible | Massive MIMO, mmWave, C-band, beamforming | High-capacity, supports FWA and mobile |
| **Core Network** | Ready | 5G Core (5GC) with MEC & vEPC | Enables ultra-low latency and network slicing |
| **AI-Driven SON** | Emerging | H2O.ai + SON from Huawei | Reduces manual tuning, risk of instability |
| **Transport (Backhaul)** | Partially ready | Microwave + Fiber | Rural last-mile needs boosting |
| **Cloud Integration** | Mature | SDN, NFV, containerization | Open RAN & ORAN support required |
| **IoT & Enterprise Support** | High value | Slicing, URLLC | Useful for banks, AR/VR, surveillance |

**C. Integration Risks**

| **Risk Area** | **Description** | **Severity** | **Mitigation** |
| --- | --- | --- | --- |
| Legacy 4G overlap | Interference & handover issues | Medium | Use DSS, dual connectivity trials |
| SON Algorithm Bias | Self-learning errors in dynamic environments | High | Use testbeds & rollback protocols |
| SDN Interoperability | Vendor lock-in or non-standard APIs | Medium | Choose ORAN-compliant vendors |
| AI data accuracy | Poor telemetry = bad predictions | High | Integrate advanced monitoring probes |
| MEC Latency bottlenecks | If cloud edge nodes are poorly deployed | High | Run latency simulation scenarios |

**D. Summary**

The technology is **feasible** for phased urban-to-rural deployment. However, **AI/SON integration and rural last-mile** backhaul pose moderate-to-high risks that must be addressed in early sprints.