**Advancing biomedical Data Science through Institutional Capacity Building and Flemish–Kenyan Collaboration at KIPRE**

| **Section** | **Suggested Page / Order** | **Notes / Rationale** |
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| **1. Project Summary** | p. 1 | A concise, high-level overview of goals, partners, duration, and budget. Should be one short paragraph (≈200 words). |
| **2. Partner Institutions** | p. 1 | Identify KIPRE (Lead Southern Institution) and the Flemish partner (University of Hasselt). Mention potential African collaborators if relevant. |
| **3. Roles and Responsibilities of Partners** | p. 2 | Clarify division of labour — capacity building, supervision, technical support, etc. |
| **4. Background and Rationale** | p. 2–3 | Contextualise the institutional and national relevance; describe the gap in data science and how this project addresses it. |
| **5. Objectives** | p. 4–5 | Include both **overall objective** and **specific objectives (medium term)** plus **expected outcomes**. |
| **6. Work Packages / Activities** | p. 5–7 | Break down into 3–5 work packages aligned with objectives. Show planned outputs per package. |
| **7. Management & Governance** | p. 7–8 | Describe management structure, steering committee, reporting, risk mitigation, etc. |
| **8. Project Timeline (5 Years)** | p. 8–9 | Show key milestones and activities per year — usually a table or Gantt-style layout. |
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| **10. Sustainability and Long-term Impact** | p. 11–12 | Explain institutionalisation of the Data Science Unit, retention of capacity, integration into policy and training programmes. |

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## Project summary

The proposed project aims to advance biomedical data science at the Kenya Institute of Primate Research (KIPRE) through institutional capacity building and strategic Flemish–Kenyan collaboration.

By establishing a functional Data Science and Analytics Unit (DSAU), strengthening human resource capacity, and developing robust data governance frameworks, the project will enhance KIPRE’s ability to generate, manage, and analyze biomedical and translational research data.

Over a medium-term horizon (3–5 years), the initiative will support applied data analytics in priority areas such as drug discovery, One Health surveillance, and disease modelling, while promoting sustainable partnerships, joint training, and research exchange with Flemish institutions. Ultimately, the project seeks to position KIPRE as a regional hub for biomedical data science, enabling evidence-based health innovation and policy advisory within Kenya’s evolving public health ecosystem.

## **Partner Institutions**

Lead Southern Institution:  
**Kenya Institute of Primate Research (KIPRE)** – Nairobi, Kenya  
KIPRE is a Semi-Autonomous Government Agency under the Ministry of Health mandated to conduct biomedical, translational, and preclinical research using non-human primate models and other experimental animals.

The institute also leads national programs in drug discovery, One Health disease surveillance, and bio resource conservation. KIPRE will serve as the lead institution responsible for project coordination, infrastructure development, data management, and local capacity building.

Flemish Partner Institution:  
**Hasselt University (UHasselt) –** Belgium  
UHasselt is a research-intensive university with strong expertise in biostatistics, epidemiology, and data science, particularly through its **Centre for Statistics (CENSTAT)** and Data Science **Institute (DSI).** UHasselt will provide technical and academic mentorship in data science curriculum development, advanced training, joint supervision of researchers, and collaborative research in biomedical data analytics.

**Potential African Collaborating Partners (to be confirmed):**

* **Kenya Medical Research Institute (KEMRI) –** to align biomedical data frameworks and facilitate national data integration under the Ministry of Health.
* **African Population and Health Research Center (APHRC) –** to contribute expertise in data governance, ethics, and regional capacity building.
* **Makerere University (Uganda) or Ardhi University of Tanzania –** for regional collaboration in biomedical data analytics and One Health research.

## **Roles and Responsibilities of Partners**

**Kenya Institute of Primate Research (KIPRE) – Lead Institution**

* Provide institutional leadership, project coordination, and overall implementation oversight.
* Establish and operationalize the **Data Science and Analytics Unit**, including infrastructure procurement and staffing.
* Identify and enroll local scientists and technical staff for training and mentorship under the programme.
* Lead data collection, digitization, and integration of biomedical and environmental datasets.
* Ensure ethical and regulatory compliance in all data-related activities in line with Kenyan and international standards.
* Translate research outputs into policy-relevant evidence for the **Ministry of Health** and other national stakeholders.
* Sustain project outcomes through institutional policy adoption, resource allocation, and staff retention.

**Hasselt University (UHasselt) – Flemish Partner**

* Provide technical and academic mentorship in **biostatistics, machine learning, and biomedical data analysis** through joint training, workshops, and short-term exchanges.
* Co-design the data science curriculum, training modules, and research frameworks tailored to KIPRE’s research priorities.
* Facilitate **joint supervision** of postgraduate trainees and short-term research fellows under the project.
* Support development and implementation of **data governance protocols**, aligning KIPRE practices with FAIR and GDPR principles.
* Collaborate in joint publications, grant applications, and dissemination of results at international scientific platforms.
* Contribute to long-term sustainability through capacity transfer, mentorship networks, and institutional linkages.

**African Collaborating Partners (to be confirmed)**

* **KEMRI:** Align project outputs with national health data systems and support integration into Kenya’s health research ecosystem.
* **APHRC:** Provide guidance on ethical data governance, community engagement, and evidence translation.
* **Makerere University / University of Rwanda:** Participate in co-training and benchmarking regional biomedical data science initiatives.
* Facilitate regional knowledge sharing and South–South collaboration to enhance the visibility and sustainability of project outcomes.

## Background and Rationale

The Kenya Institute of Primate Research (KIPRE) has been conducting pioneering evolutionary, biomedical, and translational research since 1958, contributing significantly to national, regional, and international health priorities. Over the decades, KIPRE has evolved into a regional center of excellence in pre-clinical and translational research, with major contributions in reproductive health and biology, tropical infectious and neglected diseases, non-communicable diseases, and environmental and animal conservation through biomedical studies involving non-human primates (NHPs).

In recent years, KIPRE has broadened its scientific scope to include molecule discovery and drug development, particularly through bioprospecting partnerships with local indigenous communities. These collaborations focus on identifying, validating, and developing bioactive compounds of medicinal value, effectively linking traditional knowledge systems with modern biomedical innovation. This approach advances scientific discovery while promoting community empowerment and benefit sharing, aligning with the global call for inclusive and ethical research practices.

In 2023, through a Government reorganization Order, the institute, formerly known as the Institute of Primate Research (IPR) under the National Museums of Kenya (NMK), was delinked and reconstituted as a Semi-Autonomous Government Agency (SAGA), guided by legal notice 207 of 2018), under the Ministry of Health (MoH). Historically, IPR’s mandate centered on advancing human medicine through studies on NHP evolution and biomedical relevance. Under its new legal and institutional framework, KIPRE now operates within the Department of Public Health Policy and Professional Standards, with an enhanced mandate to generate policy-relevant scientific evidence and provide advisory services to the Ministry on matters of public health policy and professional standards.

This governance transformation has positioned KIPRE at a strategic interface between research, innovation, and policy, offering an unparalleled opportunity to translate biomedical research into actionable national and regional health strategies. Its expanded mandate now covers a broad spectrum of translational science activities, including:

Drug discovery and development, focusing on pre-clinical evaluation of vaccines and therapeutics for neglected and emerging diseases;

Disease surveillance, mapping, and modelling within a One Health framework integrating human, animal, and environmental health;

Conservation research on endangered animal species, particularly NHPs essential for biomedical studies; and

Snakebite research and antivenoming development, addressing a neglected tropical health challenge in sub-Saharan Africa.

Despite this strong scientific and institutional foundation, KIPRE lacks a fully functional Data Science and Analytics Centre, a critical gap that limits its ability to harness modern data-driven approaches such as biostatistics, bioinformatics, and machine learning. In the current era of data-intensive research and digital transformation, the absence of an integrated data science infrastructure constrains the institute’s ability to manage complex biomedical datasets, generate predictive insights, and provide high-quality evidence for policy formulation and implementation.

Establishing a Data Science and analytics Capacity Building Unit within KIPRE would therefore be **t**ransformative. The unit would enable the institute to systematically integrate advanced analytics, biostatistical modelling, and digital infrastructure into its core programs, enhance the reproducibility, transparency, and visibility of its outputs, and strengthen north–south and south–south collaborations aligned with international biomedical research standards. Furthermore, this initiative directly supports the aspirations of Kenya’s Vision 2030, the Kenya Health Policy 2020–2030, and the Ministry of Health Digital Health and Innovation Strategy, which all emphasize data governance, technology adoption, and human resource development as drivers of sustainable health outcomes.

Through this proposed investment in data science and capacity strengthening, KIPRE seeks to build institutional resilience, cultivate advanced analytical and computational skills among its scientists, and contribute to a national ecosystem of evidence-based health research and innovation. This initiative also aligns with the VLIR-UOS TEAM 2026 focus on institutional capacity building, equitable partnerships, and locally relevant solutions, thereby positioning KIPRE as a strategic partner in driving data-enabled biomedical innovation in Kenya and the wider East African region.

## **Objectives**

### ****Overall Objective****

### To strengthen the institutional capacity of the Kenya Institute of Primate Research (KIPRE) in data science and analytics to enhance multidisciplinary research, improve evidence generation, and promote the translation of scientific knowledge into public health policy and practice in Kenya and the wider region.

### ****Specific Objectives (Medium-term: 3–5 years)****

1. **Establish a Functional Data Science and Analytics Unit at KIPRE**  
   Develop institutional structures, staffing, and infrastructure (hardware, software, and secure data repositories) to support data-driven research and decision-making across all KIPRE programmes.
2. **Build Human Resource Capacity in Biomedical Data Science**  
   Train a core team of scientists, biostatisticians, and ICT officers in advanced data analysis, machine learning, bioinformatics, and geospatial analytics through targeted workshops, mentorships, and academic exchanges with Flemish partner institutions.
3. **Digitize, Curate, and Integrate Research Data**  
   Consolidate legacy datasets from biomedical, environmental, and primatological studies into standardized digital databases, enabling efficient data sharing, reproducibility, and cross-disciplinary analysis.
4. **Develop and Implement Data Governance and Ethical Frameworks**  
   Establish institutional policies and protocols on data collection, sharing, and stewardship in compliance with FAIR data principles, research ethics, and Kenya’s digital health strategy.
5. **Apply Data Analytics to Priority Research Areas**  
   Demonstrate the utility of data science approaches in selected flagship projects—such as disease modelling, drug discovery, or One Health surveillance—to generate actionable insights for the Ministry of Health (MoH) and regional partners.
6. **Strengthen Collaborative Networks and Knowledge Exchange**  
   Foster partnerships between KIPRE, Flemish universities, and regional data science hubs to co-develop research tools, exchange expertise, and co-supervise trainees in biomedical data analytics.

### ****Expected Medium-term Outcomes****

* A fully operational **Data Science and Analytics Unit** at KIPRE supporting ongoing biomedical and translational research.
* At least **20 KIPRE staff** trained in core and advanced data science skills, with a sustainable mentorship programme in place.
* **Standardized digital databases** integrating KIPRE’s research archives and new data streams for open and reproducible science.
* **Operational data governance framework** aligned to national and international ethical and legal standards.
* **Pilot data-driven studies** completed and informing MoH policies or research interventions.
* **Sustained institutional collaborations** with Flemish partners and regional research institutions in East Africa.

## **Work packages / activities**

The project will adopt a **phased, participatory, and multi-institutional approach** combining capacity development, infrastructure strengthening, and applied research. Implementation will be structured around **five interlinked work packages (WPs)** designed to progressively build institutional readiness, human capacity, and data-driven research capability at KIPRE.

#### **Work Package 1: Institutional Setup and Infrastructure Development**

**Objective:** Establish a fully functional Data Science and Analytics Unit (DSAU) at KIPRE.

**Key Activities:**

* Renovate and equip a dedicated workspace with high-performance computing facilities, secure storage servers, and licensed analytical software.
* Develop a central data repository and backup system consistent with FAIR data principles.
* Recruit core staff (data scientists, analysts, IT officers, and a coordinator).
* Form a **Data Governance and Oversight Committee** to ensure compliance with ethical and legal frameworks.

**Expected Output:** Operational DSAU with appropriate governance structures and digital infrastructure to support biomedical and public health research.

##### **Work Package 2: Human Capacity Development**

**Objective:** Strengthen individual and institutional competencies in biomedical data science and analytics.

**Key Activities:**

* Conduct structured training workshops in **biostatistics, machine learning, geospatial analytics, and data visualization** led jointly by UHasselt and KIPRE experts.
* Implement a **train-the-trainer model** to ensure long-term sustainability.
* Facilitate **short-term academic exchanges** for KIPRE staff to UHasselt for specialized mentorship.
* Jointly supervise postgraduate research projects aligned to institutional and national health priorities.

**Expected Output:** At least 20 KIPRE staff trained in advanced data science competencies; a mentorship and knowledge-transfer framework institutionalized.

##### **Work Package 3: Data Digitization, Curation, and Integration**

**Objective:** Consolidate legacy and ongoing research data into standardized, interoperable databases.

**Key Activities:**

* Audit and digitize existing datasets from reproductive health, zoonotic diseases, venom research, and environmental studies.
* Design and deploy metadata standards for consistency and interoperability.
* Establish **automated data backup and disaster recovery systems**.
* Pilot integration of digitized datasets into national and regional research data platforms (e.g., MoH repositories, One Health networks).

**Expected Output:** Centralized and accessible institutional data repository enhancing collaboration, reproducibility, and evidence synthesis.

##### **Work Package 4: Applied Biomedical Data Analytics and Research Integration**

**Objective:** Demonstrate the value of data science in addressing national and regional health priorities.

**Key Activities:**

* Select flagship case studies (e.g., disease modelling, drug efficacy prediction, vector surveillance).
* Develop statistical and computational models to support real-time data interpretation.
* Integrate findings into **policy briefs and dashboards** for the Ministry of Health and regional partners.
* Publish collaborative research outputs in peer-reviewed journals and disseminate findings through symposia.

**Expected Output:** Data-driven biomedical insights informing health policy and translational research across One Health and disease surveillance domains.

##### **Work Package 5: Partnership, Knowledge Exchange, and Sustainability**

**Objective:** Build long-term institutional collaboration and ensure project sustainability.

**Key Activities:**

* Establish a **KIPRE–UHasselt Joint Steering Committee** to oversee project governance and strategic alignment.
* Facilitate annual **capacity-building symposia and joint dissemination events**.
* Develop a sustainability plan integrating the DSAU into KIPRE’s core budgetary and human resource framework.
* Engage regional institutions (KEMRI, Makerere, APHRC) to extend the project’s reach through **South–South collaboration**.

**Expected Output:** A sustained collaborative network promoting biomedical data science and regional capacity building beyond the project’s lifespan.

Would you like me to now write the **“Expected Impact and Sustainability”** section next?  
That part will align outcomes to SDG 3, Kenya’s Vision 2030, and the **VLIR-UOS impact pathway** (individual, institutional, and societal levels).

## **Management & Governance**

#### **Roles and Responsibilities**

The project will be jointly implemented by **KIPRE** and the **University of Hasselt (UHasselt)** under a structured governance framework that ensures transparency, accountability, and effective coordination.

* **KIPRE** will serve as the **lead implementing institution**, responsible for overall coordination in Kenya, local stakeholder engagement, and integration of project activities within its institutional systems. KIPRE’s Directorate of Research, Data Science Unit, and ICT Department will jointly oversee technical implementation, monitoring, and sustainability.
* **UHasselt** will provide **technical expertise, mentorship, and training support**, including curriculum co-development, exchange programmes, and collaborative research supervision.
* **Other African partners**, where relevant, will support **regional training, resource sharing, and joint dissemination** of best practices in biomedical data science.

#### **Steering Committee**

A **Project Steering Committee (PSC)** will provide strategic guidance and oversight. It will comprise:

* The **Project Principal Investigators (PIs)** from KIPRE and UHasselt;
* Representatives from the **Ministry of Health (Kenya)** and **Flemish Interuniversity Council (VLIR-UOS)**;
* A representative of the **research and data science community**; and
* A **Finance and Administration Officer** from KIPRE.

The PSC will meet biannually (virtually or in person) to review progress, approve annual work plans, and guide decision-making on major project adjustments.

#### **Risk Mitigation**

| **Potential Risk** | **Mitigation Strategy** |
| --- | --- |
| Delays in procurement or administrative approvals | Early planning and alignment with KIPRE’s procurement schedule; delegated project management authority. |
| Limited availability of skilled trainers | Joint training-of-trainers model leveraging UHasselt’s expertise and regional academic networks. |
| Data access or sharing restrictions | Development of data-sharing agreements and compliance with ethical and regulatory frameworks. |
| Staff turnover | Capacity building of multiple staff per unit and institutional documentation of project processes. |
| Sustainability beyond funding period | Embedding data science functions within KIPRE’s structure and linking to national health data policy frameworks. |

## **Budget Outline**

Major cost categories

Indicative figures (without going into full detail)

## **Project timeline (5 Years)**

| **Year** | **Key Activities** | **Milestones / Outputs** |
| --- | --- | --- |
| **Year 1** | **Project Initiation and Institutional Setup** | • Steering Committee established and operational• Needs assessment and baseline mapping of data science capacity at KIPRE• Recruitment of core technical team (data scientists, biostatisticians, ICT officers)• Procurement of hardware, software, and establishment of secure data infrastructure• Joint inception workshop with University of Hasselt and regional partners |
| **Year 2** | **Capacity Building and Training Programme Launch** | • Development and implementation of tailored training curriculum (biostatistics, machine learning, bioinformatics, data management)• First round of staff training workshops and online modules• Establishment of mentorship and exchange programmes with Flemish partner institutions• Launch of internal data seminars and applied analytics projects at KIPRE |
| **Year 3** | **Data Integration, Policy Development, and Pilot Analytics Projects** | • Digitisation and curation of legacy datasets into a unified data repository• Development of institutional data governance and ethics framework (aligned with FAIR principles)• Implementation of pilot analytics studies (e.g., disease modelling, drug discovery, One Health surveillance)• Mid-term review and technical audit |
| **Year 4** | **Application, Dissemination, and Regional Networking** | • Publication of pilot study results and integration into Ministry of Health policy briefs• Strengthening of collaborative research projects with Flemish and African partners• Hosting of a regional Data Science Symposium at KIPRE• Expansion of the mentorship programme to include regional trainees |
| **Year 5** | **Institutionalisation and Sustainability Phase** | • Full operationalisation of the Data Science and Analytics Unit within KIPRE’s organisational framework• Internalisation of training modules into KIPRE’s continuous professional development programme• Financial and administrative integration into KIPRE’s core budget• Endline evaluation and sustainability roadmap (post-project strategy)• Preparation of follow-up proposals and long-term collaboration agreements |

## **Budget Overview and Justification (Total: €300,000)**

| **Budget Category** | **Amount (€)** | **% of Total** | **Justification** |
| --- | --- | --- | --- |
| **1. Personnel and Expert Support** | **75,000** | **25%** | Partial support for KIPRE project coordination team (Project Lead, Data Manager, and Administrative Assistant); local technical assistants; and short-term consultancy inputs from Flemish experts in biostatistics, data governance, and machine learning. Supports stipends for early-career trainees assisting with data digitisation and analysis. |
| **2. Capacity Building and Training** | **60,000** | **20%** | Short courses, workshops, and mentorships in biomedical data science; academic exchanges and attachments at the University of Hasselt; joint supervision of postgraduate students; development of e-learning modules and data analytics curricula for KIPRE’s internal use. |
| **3. Research Infrastructure and Equipment** | **60,000** | **20%** | Procurement of essential infrastructure for the Data Science and Analytics Unit: high-performance workstations, secure data server, storage solutions, backup systems, and statistical/bioinformatics software licenses. Includes internet/network enhancement for collaborative analysis. |
| **4. Data Management and Digitisation** | **30,000** | **10%** | Digitisation and curation of legacy KIPRE datasets (biomedical, environmental, and primatological). Development of standardized metadata and institutional research repository aligned with FAIR principles. |
| **5. Collaborative Research and Pilot Studies** | **30,000** | **10%** | Implementation of 2–3 pilot data-driven projects demonstrating the value of analytics in policy translation (e.g., disease modelling, bioactive compound discovery, or One Health surveillance). Covers data collection, analysis, and dissemination workshops. |
| **6. Travel and Exchange Visits** | **21,000** | **7%** | Two-way mobility for researchers and students between KIPRE and Flemish partners; attendance at coordination meetings and symposia; field visits to regional data science hubs for benchmarking and partnership development. |
| **7. Dissemination, Communication, and Policy Engagement** | **15,000** | **5%** | Stakeholder engagement activities, policy briefs, communication materials, dissemination workshops, and publication support. Includes a public-facing project webpage and outreach to the Ministry of Health. |
| **8. Monitoring, Evaluation, and Contingency** | **9,000** | **3%** | Midterm review, financial audits, and risk mitigation. Includes adaptive management for inflation or unanticipated technical requirements. |

**Total Project Budget: €300,000**

### ****Budget Rationale****

This allocation prioritizes:

* **Institutional capacity building over short-term research outputs**, ensuring sustainability through skill transfer and infrastructure investment.
* **Balanced co-funding**:
  + In-kind contributions from KIPRE (lab facilities, personnel time, office space, utilities).
  + Academic and technical contributions from the University of Hasselt (training modules, co-supervision, remote access to computing resources).
* **Scalability and sustainability**, ensuring the Data Science and Analytics Unit remains functional beyond the project period, supporting KIPRE’s research and national data needs.

## **Sustainability**

The project has been deliberately designed to ensure that its outcomes are **institutionally embedded**, **financially viable**, and **strategically aligned** with national and regional priorities beyond the 3–5 year implementation period.

#### **Institutional Sustainability**

* The **Data Science and Analytics Unit (DSAU)** will be fully integrated into KIPRE’s organisational structure under the Directorate of Research, ensuring that it remains a core institutional function beyond project completion.
* The DSAU will serve as a **central data hub** supporting all research divisions—reproductive health, infectious diseases, non-communicable diseases, and environmental health—thereby guaranteeing sustained relevance and utilisation.

#### **Human Resource and Skills Sustainability**

* A **train-the-trainer model** will be adopted, ensuring that at least 5–10 trained KIPRE scientists and ICT officers become certified in delivering future internal and regional training.
* Joint postgraduate supervision and exchange programmes with **University of Hasselt** and other Flemish institutions will establish a **long-term academic pipeline** for advanced data science and biostatistics expertise.

#### **Financial Sustainability**

* KIPRE will progressively allocate a portion of its **annual research and development budget** to support the operations of the Data Science Unit.
* The project will also explore **cost-sharing models**, including income from collaborative research, consultancy services, and data analytics support to government and private-sector partners.
* The established unit will be positioned to **leverage additional regional and international funding**, including EU–Africa and WHO-AFRO data innovation initiatives.

#### **Policy and Strategic Linkages**

* The project is aligned with the **Kenya Digital Health Strategy (2020–2030)** and the **National Research Priorities**, enhancing the likelihood of continued government support.
* KIPRE’s integration within the **Ministry of Health** structure positions it to institutionalize data governance and analytics frameworks at the national level, ensuring policy-level continuity.

#### **Exit Strategy**

* In the final year, the project will implement a **transition plan**, transferring technical and administrative responsibilities from project-based staff to permanent KIPRE personnel.
* An **endline evaluation** will assess institutional readiness for self-sustained operation and identify pathways for continued collaboration with Flemish and regional partners.
* A **five-year post-project roadmap** will be developed, outlining strategies for continued training, infrastructure maintenance, and policy engagement.