

Review

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Leading Change Across a Continent: PAN-LASE's Roadmap for the Future Growth and Development of Research Animal Science and Ethics Across Africa

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Review

Leading Change Across a Continent: PAN-LASE's Roadmap for the Future Growth and Development of Research Animal Science and Ethics Across Africa

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Simple Summary: Animals are used in research to develop new medicines, to enhance farming methods and to conserve species. Good animal welfare practices and appropriate ethical review is critical in ensuring high-quality humane research involving animals. However, there are limited professional education opportunities in Africa for those involved in the care and use of research animals, and few animal ethics committees. The Pan-African Network for Laboratory Animal Science and Ethics (PAN-LASE) was formed to address these gaps. Building on previous activities, we have created a RoadMap for the future which includes: creating Africa-centric learning opportunities and resources; changing mind-sets on animal welfare; supporting the development of research animal sciences associations; creating structures, processes and organisations that reflect Africa; engaging with key national and pan-African regulatory organisations and stakeholders; identifying unique

selling points for African research involving animals. These recommendations will enable the sustainable growth and development of PAN-LASE across Africa by providing solutions that will work for Africa. Our Road Map is also applicable to other animal welfare sectors and to other resource constrained countries or regions. A template for interested parties to develop similar activities in their own discipline, country or region.

Abstract: The Pan-African Network for Laboratory Animal Science and Ethics (PAN-LASE) provides professional education opportunities for all those involved in the care and use of animals in research across Africa, and supports the development of structures, policies and procedures to facilitate high-quality, humane research involving animals across the continent. To ensure the continued, sustainable growth and development of its activities, PAN-LASE founding members and other key stakeholders convened in Kenya to co-create a forward-thinking Road Map for the organisation. The Road Map includes the following recommendations: creating Africa-centric learning opportunities and resources; changing mind-sets on animal welfare; supporting the development of research animal sciences associations; creating structures, processes and organisations that reflect Africa; engaging with key national and pan-African regulatory organisations and stakeholders; identifying unique selling points for African research involving animals; creating a PAN-LASE Steering Committee. These recommendations will enable the sustainable growth and development of PAN-LASE across Africa by providing solutions that will work for Africa. Our Road Map is also applicable to other animal welfare sectors, other pillars of the One Health Triad, and to other resource constrained countries or regions. A template for interested parties to develop similar activities in their own discipline, country or region.

Keywords: Education; professional education; training; animal welfare; ethics; animal ethics committee; research animal; laboratory animal

1. Introduction

Like many emerging countries and regions, legislation, regulation and national standards governing the care and use of animals for research across Africa is highly variable [1,2]. Ethical review processes are in their infancy across most of the continent, and there are limited opportunities for the education, training and professional development of all stakeholder communities [2,3]. To address these issues, the Pan-African Network for Laboratory Animal Science and Ethics (PAN-LASE) was formed in 2017 [2]. Its mission to promote the humane and ethical use of animals for scientific and educational purposes as well as high-quality, impactful science from research involving animals.

Between 2017 and 2023, PAN-LASE's activities have included the provision of professional educational opportunities for all stakeholders involved in the care and use of research animals [2], the establishment Animal Ethics Committees [2,3], Centres of Excellence in animal welfare and Communities of Practice, the creation of Guidelines for Animal Ethics Committees in Africa [3], and the publication of Learning Outcomes Frameworks for animal caretakers [4], veterinarians and para-veterinary professionals [5]. We have created a resource-light, sustainable educational model that could be implemented in other resource-constrained countries and regions to develop similar activities for themselves [2].

PAN-LASE founding members, the Africa Regional Committee of the International Council for Laboratory Animal Science (ICLAS) and other stakeholders, who have been involved in the creation and delivery of PAN-LASE's activities, reflected on our substantial achievements to date and collectively agreed on the need to create a Road Map for our continued growth and development across Africa. This Road Map would not only benefit Africa but also would be applicable to other resource constrained countries or regions, not only in research animal sciences, but also as a template for the development of activities in other animal welfare sectors, other pillars of the One Health Triad [6], or to address UN Sustainable Development Goals [7].

Funding was obtained from Faculty of Biological Sciences [8] (University of Leeds, UK) Impact and Innovation Committee to convene a meeting of PAN-LASE founding members and other stakeholders who have been involved in the creation and delivery of PAN-LASE's activities. Additional funding was provided by the South African Association for Laboratory Animal Science [9] (SAALAS) to support the attendance of two of its members. The support of these Organisations and of the Kenya Institute of Primate Research [10] is gratefully acknowledged.

This meeting, convened in Nairobi, Kenya from 24th-25th July 2023, was hosted by the Kenya Institute of Primate Research [10]. Participants attended either in-person or virtually (See Appendix A).

The meeting brief was to:

- Create a sustainable, evidence-informed Roadmap for the continued development and growth of PAN-LASE and its activities across Africa, which could be used as template in other resource-constrained countries or regions across the world.
- Decide the future organisation, governance and structure of PAN-LASE.

Discussions were informed by surveys of current activities and stakeholder needs undertaken in East Africa, West and Central Africa, and South Africa, and consultations undertaken with Steering Groups members with key stakeholders in Algeria, Egypt, Tunisia and Uganda.

2. Creation of a RoadMap for PAN-LASE

2.1. Objective 1: The Continued Growth and Development of Activities Across Africa

A Design Thinking approach [11], an inclusive methodology used by Industry to create innovative solutions, was adopted with two sub-groups discussing individually then reporting to a plenary session at each stage of the Design Thinking process. It was facilitated by Prof D Lewis (University of Leeds), supported by Dr B Mohr (Scientific Veterinary Consulting [12]).

2.1.1. Stakeholders

The following Stakeholders were identified: Researchers; Project Leaders; Facility Managers; Animal Facility Staff; Veterinary & Para-veterinary professionals; Animal Ethics committees and their members; Administrators; Organisations, Institutions, Industry, Wildlife managers, Farmers; Animal Welfare Organisations; Professional, Regulatory and Statutory Bodies; Funders; Public.

Information from the surveys of current provision of professional education opportunities, stakeholder-identified needs, and the Statutory & Regulatory oversight of research animal sciences and ethics across Africa was shared.

2.1.2. Identifying Gaps in Current Provision

There is substantial variation in quality and quantity of education, professional education, and life-long learning opportunities, both between the different stakeholder groups and across the Continent. Most existing African animal welfare or other legislation does not require the provision of animal welfare education and training opportunities for stakeholders [1–3]. Going forward it is therefore critical to provide tailored educational opportunities for all those involved in the care and use of research animals whatever their role or job. Further, by increasing the requirement for education and training within legislation or regulations will give it legitimacy and authority, act as stimulus for change, and promote the development of new opportunities. It would also act as a catalyst for funding.

However, to support educational development across the continent, and for this provision to be sustainable, resource-light, and facilitate the free movement of human resource between countries, harmonised pan-African rather than national curricula, Learning Outcomes Frameworks and linked educational resources will need to be created. A move across the Continent towards minimum standards for education, training and professional education for all stakeholder communities, with

this provision being certified or accredited, encompassing mechanisms and processes to ensure quality assurance and consistency.

There is limited awareness across all stakeholder communities involved in the care and use of research animals of current education, professional education and life-long learning opportunities, and therefore a need, not only to proactively promote current opportunities, but also new opportunities as they are created.

This lack of awareness of the need to provide educational opportunities for all stakeholder groups extends to the leadership of many Institutions, Organisations, Governmental and Non-Governmental Organisations, and Professional, Statutory and Regulatory Bodies (PSRB). These individuals and organisations have a key leadership role in proactively supporting and promoting change. Without this leadership, the full benefits and impact on individuals, animal welfare, the humane use of animals in research, and the ability to undertake high quality, reproducible and impactful science across the Continent will not be realised.

Enhanced educational opportunities also has the potential to change mindsets. By raising awareness of the need for a Culture of Care [13], what it means in practice, and its subsequent adoption by institutions, the research animal scientific community and by the public will broaden the thinking and understanding of all stakeholders of intrinsic value of animal life, the mental-emotional wellbeing of animals and humans, sentience, the ability of animals to suffer, and why caring for animals in any environment is important.

2.1.3. Challenges in Addressing the Current Gaps in Provision

Animal welfare, particularly of research animals, is not a high priority for Governments or Professional Statutory & Regulatory Bodies (PSRBs) given the far bigger societal, health and wellbeing, and socio-economic challenges Africa faces [14]. Whilst animal welfare legislation could provide a driver for change, the limited extent of such legislation across the continent has resulted in restricted liaison and collaboration between stakeholders, PSRBs, and Pan-African Governmental and non-Governmental Organisations. To drive forward change, there is a need for increased collaboration between all parties at multiple levels, a simultaneous top down and bottom-up approach, a willingness of all to engage, and appropriate resourcing to support these collaborations.

Restricted numbers of policies at the Institutional level means that a Culture of Care [13,15] is not appropriately developed or implemented across the Institution or Organisation, with animal welfare and the mental-emotional wellbeing of animals a low priority. Stakeholder awareness of the need for, and benefits of, a strong Culture of Care across an Institution or Organisation is limited. There is a confusion between animal rights versus animal welfare, and limited understanding of these issues by Institutional Leadership, Regulators and Governments. There is a need for more educational provision to address this knowledge gap. A re-orientation of mind-sets of some individuals, not only within the research animal sciences community, but more broadly within Society, to the concept of a Culture of Care. That everybody, more broadly, understands the animal experience.

The adoption or enhancement of a Culture of Care within an institution or organisation must also include a greater acceptance of others. An understanding by all that everybody, regardless of role or seniority, has a voice, and that his or her opinions on animal welfare and their experience should be valued and respected. This should be part of a drive to enhance equity, diversity and inclusion across Institutions and the Sector.

The lack of Pan-African networks or Communities of Practice for key organisations or bodies, for example, of Research/Laboratory Animal Sciences Associations or Animal Ethics Committees, means that there is limited sharing of good practice and no support networks, hindering growth and development of the sector.

There are few appropriate educational resources available. Most existing educational resources are pay to use. They have been created for use in the Global North and therefore reflect Global North legislation, culture and values [16]. There is a need to create resources and opportunities that are

Africa-centric, and which reflect African culture, context and resource [12]. To appropriately support this educational delivery requires competent research animal sciences educators and trainers, however there are few such individuals across the Continent, with limited opportunities for professional development of new or existing educators.

The availability, access to, and funding for education, training and life-long learning opportunities is not equitable between roles. Most roles do not have a requirement for life-long learning.

There are few Quality Assurance or regulatory mechanisms for education, training or life-long learning provision, consistency or harmonisation of this provision, or mechanisms for the assessment and regulation of competencies (knowledge, skills and behaviours).

There is a need to create solutions to address all these issues.

2.1.4. Recommendations to Address the Identified Gaps

1. Create Africa-centric education, training and life-long learning opportunities and resources.
2. Co-create professional educational and life-long learning opportunities for Attending Veterinarians.
3. Create resources, structures, processes and organisations that reflect Africa rather than adapting Global North constructs to the Africa context.
4. Change mind-sets on animal welfare for all stakeholders including the public and support the promotion and adoption of the concept of a Culture of Care.
5. Engage with Institutions, Professional, Statutory and Regulatory Bodies and other Stakeholders to support the development of legislative, regulatory and ethical oversight.
6. Advocate for prioritisation and appropriate resource allocation in Institutions, Universities or other organisations involved in research using animals.
7. Support the creation and growth of local research (laboratory) animal science associations.
8. Support African research animal sciences through the creation of frugal resources and approaches.
9. Create a unique Selling Point for African research animal science.
10. Create a PAN-LASE Steering Committee with defined Terms of Reference.
11. Create awareness for both in-Country Policy makers, Governments and the African Union of PANLASE activities.

2.1.5. Solutions that Address the Recommendations

Reverse thinking (Recommendation 1, 2 & 3): Africa has strong animal welfare culture and values, particularly in rural communities (e.g. Ubuntu [17], Rift Valley's Totems, camel breeders in the Nigeria-Niger corridor). Rather than taking Global North educational resources, and research animal sciences structures and organisations that don't reflect their cultures and values and adapting them to suit the African context, take African values and cultures as the starting point [18]. Create research animal sciences educational opportunities [2], practices, structures and organisations that reflect the rich cultural, religious, economic and societal diversity that is Africa, and will be applicable to and work in Africa.

Africa-centric education, training and life-long learning opportunities and resources (Recommendation 1, 2 & 3): Undertake a scoping review of Africa's laws & guidelines for research animal sciences, education and training, and competence. Use this information to create tailored, Africa-centric Learning Outcomes Frameworks [4,5], resources and opportunities for each Stakeholder group and role. Establish resource-light, but effective mechanisms for the harmonisation, quality assurance, regulation and certification of this provision. It will require all stakeholders to adopt the mind-set of supporting and helping colleagues- creating and sharing resources, with supporting delivery information, with other educators across the continent. Scaffolding and support will be provided through the creation of a Pan-African research animal sciences educator network and Community of Practice, including a repository of educational resources that educators can

access, download resources/activities, and adapt/translate them, as required, to suit their needs. Consideration will need to be given to formats that work in resource-constrained contexts or for remote delivery (e.g. PDFs), and to the adoption of contemporary educational approaches that promote higher order learning, the development of competencies and cultural change (e.g. active learning, authentic assessments, reflective learning) [18]. Educators and trainers will need to be shared between Institutions and countries and supported in their work through the creation of professional development opportunities for them.

Attending Veterinarians (Recommendation 2): In partnership with Veterinary Councils and veterinary education providers, we will create research animal sciences educational opportunities within veterinary medicine programmes and/or postgraduate professional educational and lifelong learning opportunities in the discipline.

Supporting African research animal sciences (Recommendation 8): We will collate and share a “Cookbook” of frugal experimental and technical equipment and resources- tried and tested equipment and approaches that can be built from cheap, locally sourced resources, which can be used instead of expensive imported equipment and consumables.

Local Associations (Recommendation 3 & 7): Support will need to be provide for the creation and growth of Local Associations to keep things moving at a local level. Membership fees could be used to support conference attendance, particularly of those in more junior roles. It will require international financial support for educational activities, and the professional development of educators.

Lack of Legislation and PSRB oversight (Recommendation 5, 6 & 11): Addressing this lack of oversight will require PAN-LASE and other stakeholders to adopt a simultaneous bottom-up and top-down approach, engaging with Institutional Leadership to develop Institutional animal welfare policies, animal ethics committees and educational opportunities, creating sector-wide change from the bottom up (example- Supreme Council of Universities in Egypt now requiring IACUC standards). In addition, a concurrent top-down approach, engaging with National and Pan-African PSRBs, Governmental and Non-Governmental Organisations, including the African Union and AU-IBAR [20]. We will seek changes to the requirements for education and training and Animal Ethics Committee oversight through engagement and partnership with a broader range of stakeholders including funding bodies, regulators of human/veterinary medicine, and peer-reviewed journals, prioritising voluntary self-regulation and the creation of Institutional policies rather than new laws.

Changing mind-sets on animal welfare, and the promotion and adoption of the concept of a Culture of Care (Recommendation 4): We will use the potential to undertake high quality, reproducible and impactful science rather than animal welfare, including the mental-emotional wellbeing of the animal, as the motivator for culture change (reproducible and reliable science requires high quality animal welfare). This will be used to actively promote, in partnership with Institutional Leaderships, the development of institutional and individual Cultures of Care and welfare practices for animals and humans [15]. It will be reinforced and supported through appropriate educational provision (active learning, reflective practice, African rural cultural examples)[18].

Creating a unique Selling Point for African Research Animal Sciences (Recommendation 9): In partnership with researchers, we will undertake the characterisation of indigenous species (vertebrate and invertebrate) as more appropriate alternative animal models or New Approach Methodologies [21] for studies of human and animal diseases to those models currently used globally.

2.2. Objective 2: The Structure and Governance of PAN-LASE Going Forward (Recommendation 10)

PAN-LASE's activities to-date have been delivered predominantly from seven Centres of activity, often in partnership with local Laboratory Animal Sciences associations [2]. From an external, including funders, perspective, the sum of these collective activities is more impactful than consideration at a centre level. The current model of operation of PAN-LASE is ad-hoc and demand

driven, sustainability is not built in. There is a risk that, rather than growing and developing, it will lose momentum and, therefore, there is a critical need to create a sustainable structure and governance for PAN-LASE.

To get its activities truly embedded across the Continent, there is also a need to reach out to and engage with national and Pan-African PSRBs, Governmental and Non-Governmental Organisations (Recommendation 11).

The views of Stakeholders on PAN-LASE's future structure and governance were shared.

Four models were proposed:

Model A: Remain as is. A network of individual and collaborative projects and activities

Model B: A Federation of Associations (with or without a regional substructure), based on the EU FELASA model [22], acting as Not-for-Profit Education and Training provider. It would be a Legal Entity, have an Elected Board, with a paid Administration.

Model C: Progressive growth and development from current Centres of Activity/Countries, with a Pan-African Oversight Board (1-2 meetings p.a.) to plan and co-ordinate.

Model D: A Hub and Spoke critical friend model where Centres of Activity would support the growth and development of activities in immediate neighbouring countries, including the development of their own Association and educational provision.

The pros and cons of each option were discussed initially in the two sub-groups and then in plenary session. There was a recognition that no model was perfect, there would have to be compromise, and that agreed structures and organisation of PAN-LASE could change and evolve as it moves forward.

The agreed way forward was for a phased approach, led by a Steering Committee, with defined Terms of Reference.

The Steering Committee would comprise of Founding Members of PAN-LASE or their nominees: Dr AJ Mohr, Prof AM Abdussamad, Dr T Fourie, Dr A Benmouloud, Dr N Jillani (replacing Dr A Nyachio), Prof D Lewis, Prof O Souilem (or nominee), Prof K Gaafar (or Dr S Fahmy), Dr FA Fakoya, Associate Professor Lawrence Mugisha.

The Steering Committee would, within two years:

- Define a vision, mission & objectives for PAN-LASE.
- Create proposals for its name.
- Create proposals for its future governance and organisation.
- Lead on the sustainable development of projects and activities to grow and develop PAN-LASE including, but not limited to, drafting Guidelines for education and training in research animal sciences and ethics in Africa, and revising our Guidelines for Animal Ethics Committees in Africa (both potentially in collaboration with ICLAS, AU-IBAR and African Union).
- Create a resource-light web-presence.

The importance of local associations for sustainability was recognised, as was the need to engage and collaborate with AU-IBAR [20], World Organisation for Animal Health (WOAH), ICLAS, and other African PSRBs, Governmental and Non-Governmental Organisations.

3. Conclusions

We have successfully created a forward-thinking, innovative Road Map of activities and interventions for PAN-LASE going forward and agreed on a structure for its immediate governance. We have identified the key organisations with whom we must engage and form collaborative partnerships with. Together, these actions provide the solid foundation required to expand and embed, in a sustainable and progressive manner, our activities across Africa. Collectively, they will promote animal welfare and facilitate humane, ethical research involving animals across the Continent. They will support Africa researchers in undertaking high quality, impactful research that is reproducible, reliable and translatable, and contributes solutions to the many complex problems and challenges facing Africa.

Our plans are evidence-informed, with input from stakeholders from across the Continent. We used a Design Thinking approach [11], where all participants’ views and opinions are equally valued, which not only enabled us to identify the problems and challenges faced by the different stakeholder communities, but also to ideate innovative, inclusive solutions to them. We recognised the critical need to create solutions, activities, processes and structures that reflected Africa’s rich cultural, religious, societal and economic diversity rather than adapting Global North concepts and structures to the African context [18,23]. Recognising the diversity of research involving animals and of species used across the continent, we have broadened our outlook and language to research animals rather than the more “traditional” laboratory animal [23]. Together, these actions have created solutions that will work for Africa, and for all those involved in the care and use of research animals across the Continent.

Our Road Map, whilst created for research involving animals across Africa, is applicable to many other fields, disciplines and sectors. For example, it could be applied to other animal welfare sectors (e.g. farming, conservation biology) or to the other two pillars (human and environment) of the One Health Triad [6]. It is also applicable to other resource constrained countries or regions. It provides a template for interested parties or stakeholder communities to develop similar activities, structures and Organisations in their own country or region to address UN Sustainable Development Goals [7] relevant to them, in turn creating solutions to the complex challenges their nation or region may face.

Author Contributions: All authors contributed to the creation of this Road Map, with the discussions facilitated by DIL and BJM. DIL drafted the manuscript, which was then reviewed and commented on and by all authors. The paper reflects the opinion of the authors and is supported by relevant references. All authors have read and agreed to the published version of the manuscript.

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Institutional Review Board Statement: The scoping surveys of stakeholder opinions were conducted in accordance with the Declaration of Helsinki and approved by Faculty of Biological Sciences Research Ethics Committee of the University of Leeds (ref BIOSCI 19-030, [date](#)). The study did not involve animals and therefore approval from the University of Leeds Animal Welfare and Ethical Review Body was not required.

Informed Consent Statement: Informed consent was obtained from all subjects involved in the study.

Data Availability Statement: Data from the scoping surveys is available on request from DIL.

Conflicts of Interest: The authors declare no conflicts of interest.

Abbreviations

The following abbreviations are used in this manuscript:

AU-IBAR	African Union International Bureau for Animal Resources
FELASA	Federation of European Laboratory Animal Science Associations
IACUC	Institutional Animal Care and Use Committee
ICLAS	International Council for Laboratory Animal Science
PAN-LASE	PanAfrican Network for Laboratory Animal Science and Ethics
PSRB	Professional, Statutory and Regulation Body
SAALAS	South African Association for Laboratory Animal Science
WOAH	World Organisation for Animal Health

Appendix A: Participants

In Person

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