

Sustainable management of globally significant endemic ruminant livestock in West Africa: Guidelines for documenting plans supporting a breeding program



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Sustainable management of globally significant endemic ruminant livestock in West Africa: Guidelines for documenting plans supporting a breeding program

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I Purpose of this document

This document is designed to assist partners of the project 'Sustainable management of globally significant endemic ruminant livestock in West Africa (PROGEBE)' in structuring a document detailing the plans behind their national-level animal breeding programs. It, however, will also be useful to others documenting breeding plans for developing country livestock production systems, outside of this specific project.

2 FAO guidelines on animal breeding strategies

In designing the national level breeding plans, it is strongly recommended that the FAO guideline 'Breeding strategies for sustainable management of animal genetic resources' (FAO 2010; available online at <http://www.fao.org/docrep/012/i1103e/i1103e00.htm>) is consulted, and the tasks and actions suggested within followed. It is of note that these guidelines are intended to 'help countries to specify and prioritize their objectives; identify the conditions necessary for the sustainable development of their animal genetic resources for food and agriculture; benefit from the experiences of other countries with similar conditions; and find practical guidance on how to initiate or improve breed improvement programs'. This is much valuable advice in this document that is not reproduced here: specific sections of FAO (2010) are referred to where relevant.

3 Development and documentation of breeding plans

The need to develop and document well thought out breeding plans, prior to the commencement of actual breeding activities, cannot be over-stressed. Failure to do so risks failure of the breeding program and waste of scarce development resources.

The development and documentation of the breeding plans will be a considerable task, and should be led by a specific work group in consultation with other stakeholders. Section A of FAO (2010) gives further information on how such a working group could be constructed and tasks assigned. The persons actually involved in writing the document (as opposed to gathering information) may be a subset of the working group. The working group must be assigned adequate resources to cover the operational costs of developing and documenting the breeding plans (including resources for their time, to consult with other stakeholders and external experts, to run meetings/workshops etc.).

A timeline for completion of the final document should be agreed upon (for example, 6 months to 1 year), and members of the working groups assigned specific tasks inside this timeline. The final document should be approved by relevant authorities and disseminated to relevant stakeholders. The document should be considered a 'living document' and updated on regular intervals (e.g. bi-annually) to take into account learning experiences and possible changes in the situational context.

If countries are developing more than one breeding program (for example, for the same species but in different locations, or for different species) it is suggested that these be documented separately, but with reference made to the other breeding activities.

The development and documentation of these breeding plans should be considered a key outcome of resources available under PROGEBE (or other projects) to support breeding activities.

4 Suggested structure for documentation of the breeding program plans

This section provides a suggested structure for documentation of the breeding program plans. It is not intended that this is followed rigorously, but that the working group use this, along with the FAO guidelines (FAO 2010), as resource material.

Note that it is assumed that activities leading to recommendations included within this document (such as the general breeding program design, definition of a successful breeding program, required institutional arrangements and level of resourcing) are parts of the tasks assigned to the working group, whether performed internally or delegated to external consultants. It is also assumed that these activities have been performed with due attention and that the recommendations arising from them have been discussed with, and endorsed by, relevant stakeholders. Suggested prerequisite activities are given at the end of each section.

4.1 Purpose of the document

Give the purpose of the document, indicate the process involved in its formulation, and the key persons responsible.

[Suggested prerequisite: structure of the document agreed upon by the working group along with associated processes to avail the data needed to complete the document]

4.2 Background to decision to implement the breeding program

4.2.1 Background to the countries livestock development objectives and strategies

Section B of FAO (2010) describes the process of developing livestock development objectives (high-level goals or targets specific to the livestock production system) as well as a livestock development strategy (activities to meet the livestock development objectives) for the production system(s) of interest. It is noted that the livestock development strategy will typically use a combination of breeding, feeding, health care, husbandry and marketing components, but other components may also be of interest. It is assumed here that reports of this nature are available: if this is not the case, then completion of this activity should take priority to developing and documenting the specific breeding plans.

This section of the breeding plan should summarize the background to, and key components of, the documents describing the livestock development objectives and strategies (or similar). In particular attention should be paid to: a) the social and economic roles of agriculture, livestock generally, and the specific livestock production system of interest, to the country; b) relevant policies and legal instruments, and the enabling effect (or otherwise) of these; c) an assessment of the livestock production systems including a SWOT (strengths, weaknesses, opportunities, and threat) analysis and trend assessment; d) the key livestock development objectives and strategies. It is suggested that these items be discussed briefly, with references made to the underpinning documents.

[Suggested prerequisite: reports describing the countries livestock development objectives and livestock development strategy (or similar) availed, consensus from the working group of what in these reports will be summarized here]

4.2.2 The breeding component of the livestock development strategy

Following from above, the justification to implement a breeding component as part of the livestock development strategy should be described in detail/elaborated upon. This is important as not all livestock development strategies will include a breeding component. It should also articulate the priority of breeding interventions in relation to other interventions included in the development strategy (given resources to achieve the livestock development objective are likely to be limited and not all availed simultaneously).

[Suggested prerequisite: reports describing the countries livestock development objectives and livestock development strategy (or similar) availed, consensus from the working group on what in these reports will be summarized here, results of a priority setting exercise in relation to interventions/activities suggested within the livestock development strategy, over all interventions]

4.2.3 Justification for the specific breeding program of interest

Give a justification for the specific breeding program being described in the document, including (where relevant) why this breeding program is prioritized over other breeding programs or activities suggested within the livestock development strategy, and why the breeding program is being initiated at this time.

[Suggested prerequisite: reports describing the countries livestock development objectives and livestock development strategy availed, consensus from the working group of what in these reports will be summarized here, results of a priority setting exercise in relation to breeding interventions/activities suggested within the livestock development strategy]

4.3 Overview of breeding program operations and expected impact

4.3.1 Definition of a successful breeding program

Give the agreed definition of a successful breeding program, and also indicate the process in coming to this definition and actors involved. Note that in defining a successful breeding program consideration should have been given to impact not only in terms of genetic gain but, for example, in relation to smallholder livelihood, from an economic perspective, or from a food and nutritional security viewpoint.

[Suggested prerequisite: results of a workshop or similar activity, involving the working group plus other relevant stakeholders, on the definition of success for this breeding program, articulated in quantitative terms]

4.3.2 Overview of the general breeding program design and how this was informed

Describe the general breeding program design that has been agreed upon (for example, simple breeding management strategy versus a fully-operational breeding program supported by recording systems and genetic evaluation; a within-breed improvement program versus a breed substitution or cross-breeding program; the type of within-breed improvement program—single tier versus multiple tier, community or research station based) and give a justification for this design over alternatives. In addition, describe the process by which the design was informed (for example by modelling studies, or based on existing breeding programs in similar production systems) and the actors involved.

[Suggested prerequisite: report describing different options in relation to breeding program design, and the advantages/disadvantages of these, availed; decision on the most appropriate breeding program design]

4.3.3 Targeted scale of operation of the breeding program and expected impact

Describe scenarios for different scales of operation of the breeding program (at different time projections), and the effect this will have on impact (related to the agreed definition for a successful breeding program). Give justification for the scale of operation to be targeted, both initially and for the future (e.g. in 5, 10, 20, and 50 years). Give the minimum timeline for which the breeding program is required to be operational for the agreed level of impact to be achieved, as well as the timeline for which it is anticipated the breeding program will be operational (which may be indefinite or a set number of years)

[Suggested prerequisite: report describing impact associated with different scales of operation of the breeding program over different timelines (most likely informed by modelling studies); agreement on scale of operation to be targeted and the timeline of operation of the breeding program]

4.3.4 Target beneficiaries and livestock population

Outline the target beneficiaries and livestock population, for both now and the future. Include both direct beneficiaries (for example livestock keepers) and indirect beneficiaries (for example, suppliers of inputs required to support an improved breed type, consumers etc.). Where relevant, include maps showing the geographical location of operations and expected impact

[Suggested prerequisite: results of a workshop or similar activity, involving the working group plus other relevant stakeholders, on the target beneficiaries and livestock population]

4.3.5 Future scenarios

Give future scenarios for the breeding program, beyond targeted scale of operation (covered in section 4.3.3). For example, this could include regionalization of breeding programs from neighbouring countries. Indicate what is required for these scenarios to be set in place, expected timelines for this, and persons responsible.

[Suggested prerequisite: report describing different options in relation to future scenarios for the breeding program design, and the advantages/disadvantages of these, availed; decision on which of these will be targeted]

4.4 Stakeholders, implementers and managers of the breeding program

4.4.1 Stakeholders

Give a list of stakeholders to the breeding program, including a comment on stakeholder interest. Describe how the stakeholders will be involved in the breeding program, from development, through implementation, to assessment and feedback. Give timelines for interactions with stakeholders (such as workshops) and indicate who is responsible for ensuring these interactions take place. Give contact details of key stakeholders.

[Suggested prerequisite: list of stakeholders to the breeding program availed; plan developed (in conjunction with stakeholders) on how interaction with them will occur]

4.4.2 Implementers and managers

Give a specific list of organizations responsible for implementing the breeding program (which will be a subset of the stakeholders), key people within these organizations, and their specific roles. Specify who has ultimate responsibility for moving the breeding program forward, who has other managerial roles, and who has implementation roles.

Indicate the communication strategy between this team to discuss implementation the breeding program, including incorporation of feedback from stakeholders and plan adjustment. Also indicate the process to be followed should an organization not be able to meet their assigned commitments.

[Suggested prerequisite: results of a workshop or similar activity, involving the working group plus other relevant stakeholders on: who has overall responsibility for moving the breeding program forward; roles of organizations and individuals in relation to management and implementation of the breeding program; the communication strategy within this team, and between this team and other stakeholders; the process to be followed should an organization not be able to meet its commitments]

4.5 Enabling the breeding program

4.5.1 Institutional arrangements

Describe the institutional arrangements that are required to support the breeding program. Indicate which of these currently exist and which need to be strengthened or set in place. For the latter, indicate the process, persons responsible and timelines.

[Suggested prerequisite: results of a workshop or similar activity, involving the working group plus other relevant stakeholders, on institutional agreements required to support the breeding program; agreement on process to ensure these institutional arrangements, including persons responsible and timeline]

4.5.2 Resources and resource mobilization strategy

Describe the resources required for the breeding program to operate over the lifetime of the breeding program, and taking into account the expected scale of operation (as described in section 4.3.3). Specify details in relation to human resources, livestock resources, physical resources (land and equipment), start-up and operational costs, amongst others. Given the level of detail required, it may be useful to include a summary here with the full description in an annex.

[Suggested prerequisite: report detailing the full resources required to support the breeding program (human, livestock, physical, start-up and operational costs, other), by year and for the lifetime of the breeding program, availed]

Indicate how the breeding program will be resourced, e.g. public funding, private funding, public–private partnership or other arrangement, and whether this is likely to change over time (e.g. moving from public funding to covering own costs). Indicate, by year, which resources have been secured from which source and the level of resources that requires securing in the future.

[Suggested prerequisite: agreement on mode(s) of funding of the breeding program over its lifetime; documentation of level of resources currently secured by year; report on resources required (as above) availed; analysis of resources that require securing, by year]

Describe the resource mobilization strategy (with possible use of an annex). Indicate the process, persons responsible and timelines (with possible use of an additional annex). Indicate the ‘fall-back’ strategy if the required level of resources are not mobilized.

[Suggested prerequisite: results of a workshop or similar activity, involving the working group plus other relevant stakeholders, on a resource mobilization strategy; agreement on process to ensure the required resources are mobilized including persons responsible and timeline]

4.5.3 Gender strategy

Describe the gender strategy that is to be incorporated into the breeding program design and associated activities (with possible use of an annex). Indicate the processes to be followed in relation to this, persons responsible and timelines.

[Suggested prerequisite: developed gender strategy availed]

4.5.4 Monitoring and evaluation strategy

Describe the monitoring and evaluation strategy that is to be incorporated into the breeding program design and associated activities (with possible use of an annex). This should specify time-bound and measurable indicators of success of the breeding program, at various levels (output, outcome and impact). Section F of FAO (2010), entitled 'evaluating investment decisions' provides useful information in relation to developing this strategy. Indicate the processes, persons responsible and timelines.

[Suggested prerequisite: developed monitoring and evaluation strategy availed]

4.5.5 Exit strategy

Describe the exit strategy on termination of the breeding program. This may be from the point of view of a planned termination (as the breeding program was intended to only run for a specific timeframe), or an unplanned termination (such as the breeding program finishing due to a lack of continual resources, or unplanned events such as civil unrest).

[Suggested prerequisite: developed exit strategy availed]

4.5.6 Sustainability

Whilst some issues related to sustainability of the breeding program will have already been addressed (such as resource requirement), a consolidated section on this is warranted due to the critical nature of this issue. Include: a) a summary of why sustainability is important (for example, for a within-breed improvement program rates of genetic gain are typically 1–2% of the trait mean per annum, meaning the breeding program needs to be sustained for many years to achieve impact); b) a recap of the targeted time-frame of the breeding program (which may be a set number of years or on-going indefinitely) and scale of operation (with reference to section 4.3.3); c) a recap of the resources required, resources secured, and resources that require securing (with reference to section 4.5.2) d) an description of the elements beside resourcing required to ensure breeding program sustainability (e.g. securing tenure of the land from which the breeding program operates, enabling policy) and details of how these will be addressed including processes, persons responsible and timelines.

If a risk assessment was included as part of the process of developing the sustainability recommendations, a summary of the outcomes of this—identified risks and mitigation strategies— should also be included.

[Suggested prerequisite: results of a workshop or similar activity, involving the working group plus other relevant stakeholders, on sustainability issues related to the breeding program; agreement on process to ensure sustainability, including persons responsible and timeline; results of a risk assessment exercise]

4.6 Technical details of the breeding program

Technical details of the breeding program should be given as far as developed, with the recognition that some of these will be refined during breeding program implementation. Useful resources in relation to this are sections C and D of FAO (2010), respectively describing the development of straight-breeding and cross-breeding programs, and, for PROGEBE partners, 'Guidelines for the replication and improvement of the N'Dama cattle breeding program of The Gambia' Marshall and Dempfle (2011).

For example, specific technical issues for a within-breed improvement program include:

- The breeding objective and economic values of the breeding objective traits
- The selection index and selection criteria
- Recorded information: pedigree, selection criteria traits, other traits (such as for research purposes), events (such as animal movement)
- Databases and data management protocols
- The genetic evaluation protocol
- The selection and mating scheme, including breeding population size and sex/age structure
- Nucleus creation and opening the nucleus
- Animal management, including feed and health-care, as well as the environment in which animals are maintained
- Dissemination of genetically improved animals/germplasm
- Feedback to farmers and other stakeholders on the breeding program and related activities
- Documentation of the breeding program and related activities
- Capacity building of stakeholders
- Technical details in relation to implementation of the monitoring and evaluation strategy
- Technical details in relation to future scenarios for the breeding strategy, such as expansion or regionalization

[Suggested prerequisite: report describing technical details of the breeding program—prepared by an expert in animal breeding/quantitative genetics with input from the working group and other relevant stakeholders]

4.7 Timeline of activities

A timeline of all activities in relation to implementing the breeding program, as well as key events associated with on-going operations, should be given, along with persons responsible and resources to achieve the activities. This will serve as a guide in monitoring implementation and running of the breeding program (as opposed to its impact).

[Suggested prerequisite: results of a workshop or similar activity, involving the working group plus other relevant stakeholders, on an activity timeline, also showing persons responsible and resources available]

5 Concluding remarks

The development of a sustainable breeding program for livestock is a major task, requiring considerable planning and the application of various types of expertise over a long time frame. To attempt to implement a breeding program without a full planning stage will result in a breeding program that neither delivers impact nor is sustainable. Documentation of the planning stage, such as suggested in this document, will help to ensure that the planning is both systematic and transparent. The planning document will serve as a valuable guide to all breeding program activities over the lifetime of the program. As indicated earlier it is not meant to be a static document, but one that evolves along with the breeding program.

References

FAO (Food and Agriculture Organization of the United Nations). 2010. *Breeding strategies for sustainable management of animal genetic resources*. FAO Animal Production and Health Guidelines. No. 3. Rome, Italy: FAO.

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