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Overview of sections, tasks and actions

SECTION A:
Forming the working group for preparing animal breeding strategies

Task 1: Establish an inventory of stakeholders

Task 2: Identify key stakeholders and representatives, and form the working group

Task 3: Discuss a working plan with the members of the working group

Task 4: Assign responsibilities to the members of the working group

SECTION B:
Identifying livestock development objectives and strategies

Task 1: Prepare the livestock and enabling policy assessment

Action 1: Obtain the relevant information

Action 2: Clarify the role of livestock in the country's major production systems

Action 3: Summarize policies and legal instruments

Action 4: Complete the livestock and enabling policy assessment

Task 2: Prepare the production systems assessment

Action 1: Describe the human structure of livestock-keeping communities

Action 2: Describe the livestock structure of the holdings

Action 3: Describe the environment associated with the production system

Action 4: Conduct a SWOT (strengths, weaknesses, opportunities,threats) analysis of the production system

Action 5: Prepare the production systems assessment report

Task 3: Prepare the trends assessment

Action 1: Review past performance

Action 2: Predict the consequences that social trends will have on production systems

Action 3: Predict the consequences of environmental trends for livestock production systems

Action 4: Predict future demand and supply trends

Action 5: Prepare the trends assessment report

Task 4: Identify livestock development objectives

Action 1: Identify priority human objectives

Action 2: Identify livestock development objectives

Task 5: Identify the livestock development strategy

SECTION C:
Matching animal genetic resources with production systems

Task 1: Define the overall breeding goal for the production system of interest

      Action 1: Consult relevant stakeholders to identify traits of interest

      Action 2: Synthesize traits to define the breeding goal

      Action 3: Define the breeding goal

Task 2: Collate available information on experiences in the conduct of breeding programmes

Task 3: Collate available information on the roles and characteristics of the locally available breed(s)

      Action 1: Review the socio-economic and environmental characteristics of the production system

      Action 2: Describe the breeds that are present in the production system and their roles within it

Task 4: Examine possible alternative breeds

      Action 1: Set criteria for the search for alternative breeds

      Action 2: Gather information on alternative breeds

Task 5: Decide whether the breeding programme will be based on locally available or alternative breeds

Task 6: Conduct a feasibility study for the introduction of alternative breeds and take a decision

      Action 1: Review regulations and capacity

      Action 2: Assess the feasibility of the introduction

      Action 3: Organize a study tour to appraise the candidate breeds visually in its own production system

      Action 4: Decide whether to introduce the candidate breed

Task 7: Prepare the germplasm introduction plan

      Action 1: Plan how to access germplasm from the alternative breed

      Action 2: Plan how to manage the risks associated with the introduction of the alternative breed

      Action 3: Plan the evaluation of the alternative breed in the local production system

      Action 4: Plan conservation actions for local breeds that will be affected by the introduction of alternative breeds

      Action 5: Collate and cost the germplasm introduction plan

      Action 6: Seek funding for the germplasm introduction plan

      Action 7: Review the draft germplasm introduction plan and approve it if appropriate

Task 8: Implement the germplasm introduction plan

      Action 1: Assign responsibilities for plan implementation and progress reporting

      Action 2: Introduce the germplasm

      Action 3: Evaluate the introduced germplasm

      Action 4: Implement conservation measures

      Action 5: Monitor and report on progress

SECTION D:
Developing straight-breeding programmes

Tasks and actions – phase I

Task 1: Review the breeding goal and allocate responsibilities

> *Action 1: Review the breeding goal and selection criteria*
>
> *Action 2: Allocate responsibilities for planning and implementing the straight-breeding programme*

Tasks and actions – phase II

Task 2: Assess the state of current breeding practices, capacity and infrastructure

> *Action 1: Gather detailed information on breeding practices and structure*
>
> *Action 2: Gather information on available human resources*
>
> *Action 3: Assess the availability and suitability of technical support services*
>
> *Action 4: Assess current market signals for animals*

Task 3: Prepare the plan for the start of the straight-breeding programme

> *Action 1: Plan how to meet the personnel and management structure requirements*
>
> *Action 2: Plan the establishment of a breeding nucleus*
>
> *Action 3: Plan the transport and communication infrastructure within the breeding nucleus*
>
> *Action 4: Plan recording policies within the nucleus*
>
> *Action 5: Plan the management of the stock within the nucleus*
>
> *Action 6: Plan the selection policies and selection targets within the nucleus*
>
> *Action 7: Define the selection index*
>
> *Action 8: Plan the genetic evaluation procedure*
>
> *Action 9: Plan the dissemination and marketing of improved stock*
>
> *Action 10: Carry out a SWOT analysis*
>
> *Action 11: Obtain an investment appraisal*
>
> *Action 12: Deliver the straight-breeding programme plan to the policy-makers and revise if necessary*

Task 4: Set up the financial and organizational structures

> *Action 1: Secure the necessary funding*
>
> *Action 2: Develop training programmes*

Task 5: Implement the straight-breeding programme

> *Action 1: Manage the implementation of the development plan on a daily basis*
>
> *Action 2: Involve progressive and competent livestock owners*
>
> *Action 3: Strengthen contact with the extension service*
>
> *Action 4: Monitor and report on progress*

Tasks and actions – phase III

Task 6: Open the nucleus to superior genetic merit

> *Action 1: Carry out an empirical comparison of herds/flocks within and outside the improvement programme*

Task 7: Improve dissemination and distribution

> *Action 1: Ensure that market signals promote the use of improved stock*
>
> *Action 2: Examine the case for improved dissemination methods*

Task 8: Improve recording and evaluation

      Action 1: Consider introducing pedigree recording

      Action 2: Consider the need for more structured recording

      Action 3: Consider the use of (BLUP) for breeding value evaluation

Task 9: Optimize the selection intensity and the generation interval

      Action 1: Review selection and mating structure

      Action 2: Consider how to increase the female reproductive rate through improved management

      Action 3: Consider ways to increase reproductive rates through the use of reproductive technology

      Action 4: Review the adequacy of the genetic links between dispersed locations

      Action 5: Improve selection across age groups and locations

Task 10: Ensure that the programme is delivering as expected

      Action 1: Estimate the effective population size and consider ways to ensure
        that it is sufficiently large (greater than 50)

      Action 2: Consider the potential effects of differences between management in the top tier of
        the breeding programme and that in the production tier

SECTION E:
Developing cross-breeding programmes

Tasks and actions – phase I

Task 1: Review the breeding goal and allocate responsibilities

      Action 1: Review the broad objectives of the cross-breeding programme

      Action 2: Rllocate responsibilities for planning and implementing the cross-breeding programme

Tasks and actions – phase II

Task 2: Assess the current state of breeding practices, capacity and infrastructure

      Action 1: Gather detailed information on breeding practices and structure

      Action 2: Gather information on available human resources

      Action 3: Assess the availability and suitability of technical support services

      Action 4: Assess current market signals for cross-bred animals

      Action 5: Assess the possible extent of existing cross-breeding

Task 3: Prepare the plan for the start of the cross-breeding programme plan

      Action 1: Plan the requirements for personnel and management structure

      Action 2: Plan the establishment of the cross-breeding programme

      Action 3: Plan the transport and communication infrastructure

      Action 4: Identify the requirements of the alternative breed that is to be
        used in the cross-breeding programme

      Action 5: Plan recording policies within the different tiers of the programme

      Action 6: Plan the distribution of improved genetic materials

      Action 7: Carry out a SWOT (strengths, weaknesses, opportunities, threats) analysis

      Action 8: Obtain an investment appraisal

      Action 9: Deliver the draft development plan to the policy-makers and revise as needed

Task 4: Set up the financial and organizational structures

Action 1: Secure the necessary funding and organizational framework

Action 2: Develop training programmes

Task 5: Implement the cross-breeding programme plan

Action 1: Manage the implementation of the plan on a daily basis

Action 2: Involve progressive and competent livestock owners/keepers

Action 3: Develop solutions to the management constraints faced by the livestock keepers

Action 4: Strengthen contact with the extension service

Action 5: Monitor and report on progress

Task 6: Organize the delivery of cross-breeding services

Action 1: Improve the organization of the cross-breeding services

Action 2: Establish efficient delivery systems for genetic material

Action 3: Consider using artificial insemination (AI)

Action 4: Develop research proposals for improving the germplasm delivery systems

Tasks and actions – phase III

Task 7: Improve the cross-breeding services and promote uptake

Action 1: Consider incentives to improve the uptake of the cross-breeding services 1-7

Action 2: Consider branding cross-breeding services

Action 3: Communicate knowledge of cross-bred animals

Action 4: Establish a performance recording system

Action 5: Consider establishing a basic pedigree recording system

Task 8: Evaluate the cross-breeding programme for benefits and sustainability

Action 1: Provide funds and expertise for an objective evaluation

Action 2: Evaluate whether a long-term strategy for cross-breeding is in place

Action 3: Conduct a field assessment of the cross-bred stock

Action 4: Carry out an assessment of genetic impact on the integrity of local breeds

Task 9: Report on progress

SECTION F:
Evaluating investment decisions

Task 1: Identify the perspectives and evaluation criteria

Action 1: Decide on evaluation criteria

Action 2: Decide on the perspectives for the evaluation

Action 3: Decide how economic returns should be presented

Task 2: Identify and derive cost and returns

Action 1: Identify major components of the animal breeding programme

Action 2: Wherever possible, identify the costs of inputs and returns on outputs

Task 3: Analyse cost and benefit

Action 1: Determine costs and revenues in each planning term period for each stakeholder

Action 2: Use the agreed discount factor to convert costs and revenues to net present value

Action 3: Calculate benefit according to the desired profit function

Action 4: Where appropriate, test the sensitivity of the cost-benefit analysis

Action 5: Report results of the cost-benefit analysis to the policy-makers

Task 4: Evaluate the benefit and decide on investments

Action 1: Consider the outcome of the cost-benefit analysis

Action 2: Consider whether benefits are equitably shared among stakeholders

Action 3: Consider the national impact

Action 4: Consider impacts not included in the cost-benefit analysis

Action 5: Consider a no-investment scenario

Action 6: Decide on investment and future evaluation policy

FAO ANIMAL PRODUCTION AND HEALTH GUIDELINES

1. Collection of entomological baseline data for tsetse
   area-wide integrated pest management programmes, 2008 (E)
2. Preparation of national strategies and action plans for
   animal genetic resources, 2009 (E, F, S, R**)
3. Breeding strategies for sustainable management of
   animal genetic resources, 2010 (E)

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E	–	English	**	In preparation
F	–	French	e	E-publication
S	–	Spanish		
R	–	Russian		

The FAO Animal Production and Health Guidelines are available through the authorized FAO Sales Agents or directly from Sales and Marketing Group, FAO, Viale delle Terme di Caracalla, 00153 Rome, Italy.

The *Global Plan of Action for Animal Genetic Resources*, adopted in 2007, is the first internationally agreed framework for the management of biodiversity in the livestock sector. It calls for the development of technical guidelines to support countries in their implementation efforts. Guidelines on the *Preparation of national strategies and action plans for animal genetic resources* were published by FAO in 2009 and are being complemented by a series of guideline publications addressing specific technical subjects.

These guidelines on *Breeding strategies for sustainable management of animal genetic resources* address Strategic Priority Area 2 of the *Global Plan of Action* – "Sustainable use and development". They have been endorsed by the Commission on Genetic Resources for Food and Agriculture.

Genetic improvement is an essential component of the management of animal genetic resources and can make important contributions to food security and rural development. Yet, the majority of developing countries have not been successful in sustaining breed development programmes. The objective of these guidelines is to help countries plan and develop effective genetic improvement programmes and to maximize the chances that such programmes will be sustained. They are intended for use by policy-makers and organizations involved in livestock development. They provide practical advice on how to identify livestock development objectives and strategies and define breeding objectives that are in line with them, match animal genetic resources to production systems and identify the most appropriate breeding scheme, initiate or improve straight-breeding or cross-breeding programmes and evaluate investment decisions.