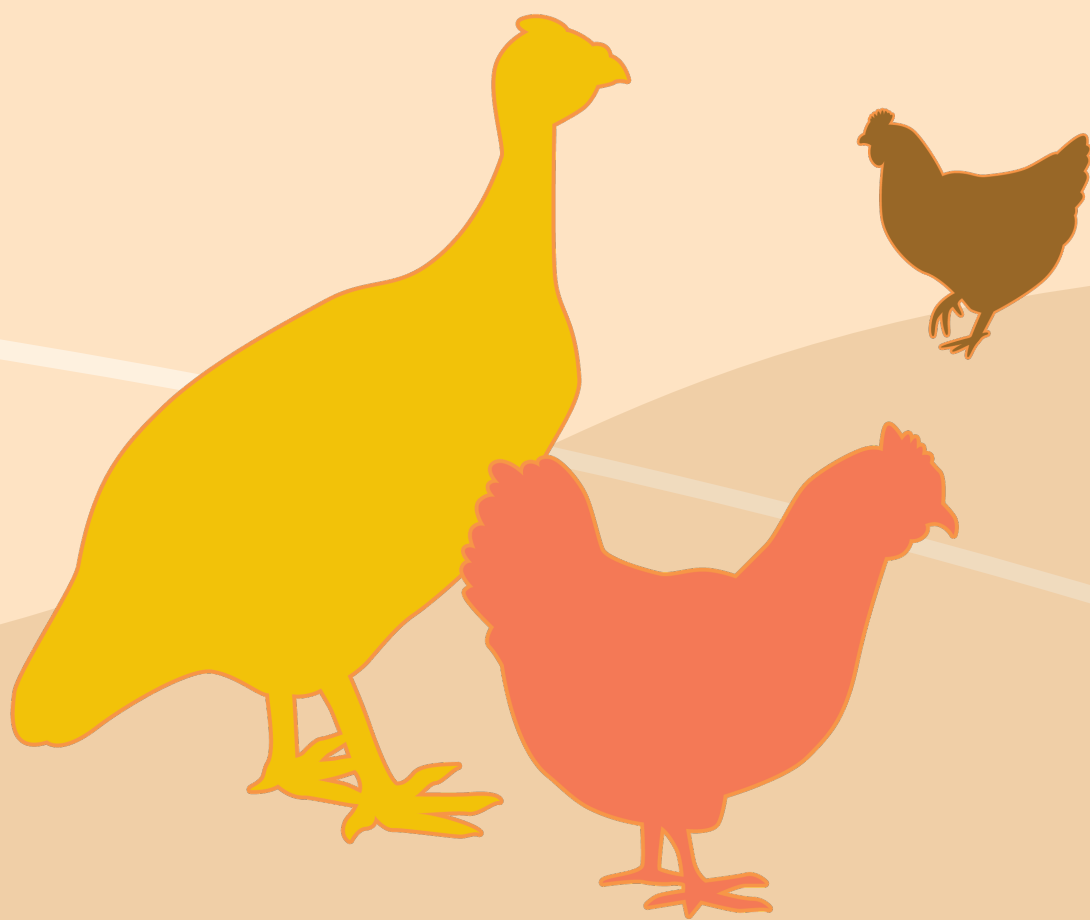
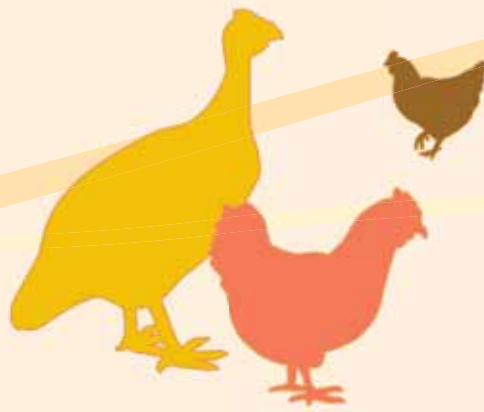


LESSONS LEARNED ON DIVERSIFICATION EXPERIENCES IN THE SPECIAL PROGRAMMES FOR FOOD SECURITY IN SUB-SAHARAN AFRICA



INTEGRATED FOOD SECURITY SUPPORT SERVICE (TCSF)
POLICY AND PROGRAMME DEVELOPMENT SUPPORT DIVISION
TECHNICAL COOPERATION DEPARTMENT





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ACRONYMS AND ABBREVIATIONS

AGIDE	Association for Integrated and Sustainable Environmental Management
ASP	Agricultural subproduct
AVE	Veterinary and breeding auxiliary
BADEA	Arab Bank for the Economic Development of Africa
CAADP	Comprehensive Africa Agriculture Development Programme
CADEF	Action Committee for the Development of Fogny
CAP	Community Action Programme (Niger)
CAT-K	Technical Support Centre of Kolokopé
CEBV	Cattle and Livestock Economic Community
CERF	Central Emergency Response Fund (UN)
CEMAC	Central African Monetary and Economic Community
CILSS	Permanent Interstate Committee for Drought Control in the Sahel
CIRAD	International Cooperation Centre of Agricultural research for Development
CSAO	Club du Sahel et de l’Afrique de l’Ouest
CTA	Technical Centre for Agricultural and Rural Cooperation
DFID	Department for International Development (UK)
DSCRP	Strategic Growth and Poverty Reduction Document (Gabon)
ECOWAS	Economic Community of West African States
EIG	Economic Interest Group
EU	European Union
FAO	Food and “Agriculture” Organization of the United Nations
GEF	Global Environmental Facility
GVPR	Groupement des Vétérinaires Privés en Clientèle Rurale
ICAT	Technical Advice and Support Institute
IDA	International Development Association
IDB	Inter-American Development Bank
IEPC	Initiative “Elevage, pauvreté et croissance”
IFPRI	International Food Policy Research Institute
ILRI	International Livestock Research Institute
ISNAR	International Service for National Agricultural Research
IUCN	International Union for Conservation of Nature
MC2	Mutuelles Communautaires de Croissance
MDG	Millennium Development Goal
MFI	Micro-finance institution
NEPAD	New Partnership for Africa’s Development
NGO	Non-governmental organization
NPFS	National Programme for Food Security
PANA	Panafrican News Agency
PHRD	Policy and Human Resources Development Fund (Japan)
PNPE	National Programme for Small Livestock Development
PROSDRP	Sectoral Programme for Productive Rural Development (Burkina Faso)
RAF	Regional Office for Africa (FAO)

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RIR	Rhode Island Red
RPFS	Regional Programme for Food Security
SMIG	Guaranteed minimum interprofessional wage
SPFS	Special Programme for Food Security
SSA	Sub-Saharan Africa
SWAC	South West African Club
TC	Technical Cooperation Department
TCS	Policy and Programme Development Support Division
TCOS	SPFS Management and Coordination Service
TCP	Technical Cooperation Programme
TCSF	Integrated Food Security Support Service (formerly TCOS)
TFP	Technical and financial partner
UJAK	Young Farmers' Union, Koyli-Wirndé
UNDP	United Nations Development Programme
WAEMU	West African Economic and Monetary Union
WFP	World Food Programme

PREFACE



Generally speaking, different programmes, policies and strategies implemented in sub-Saharan Africa (SSA) have not had the expected impact in terms of reduction of poverty and food insecurity. This observation was made by Carl Eicher after analysing 63 000 projects implemented from 1953 to 2000 (Eicher, 2003).

At the request of heads of African states, FAO launched the Special Programme for Food Security (SPFS) in 1994, in order to improve the food security of poor households and contribute to the reduction of poverty and unemployment, in particular through income-generating activities. The SPFS aims to help countries promote and disseminate simple and inexpensive technologies, which are easy to reproduce and capable of improving yield and incomes in poor agricultural households. It encourages investment in rural infrastructure, non-farm income generation, urban agriculture and social protection mechanisms.

The activities developed within the framework of the SPFS are grouped into four main components:

- water control and management;
- intensification of agricultural production;
- diversification of agricultural production (in particular, introduction of short-cycle animal husbandry); and
- constraints analysis.

For more than 10 years under the “diversification” component, FAO has been developing a gradual multilevel approach based on simple, sustainable and replicable technologies for use by small producers (in particular, women and youth in rural and peri-urban areas). Former approaches that have failed to bring

about significant changes in terms of technical progress in traditional breeding in Africa may thus be abandoned. Diversification breeding activities concern:

- the main domestic short-cycle species – small ruminants (sheep and goats), poultry (chickens, ducks and guinea fowl), pigs, rabbits and aulacodes;
- the associated service units – animal health, trade, product processing and harnessed traction;
- mixed agropastoral activities; and
- dairy and delicatessen – production and sale.

This report is an assessment of activities conducted in 11 sub-Saharan African countries (Burundi, Central African Republic, Congo, Gabon, Togo, Senegal, Burkina Faso, Cameroon, Mali, Niger and Chad), where a diversification approach has been adopted, attracting attention both at home and abroad, with important contributions from national and international donors.

This study capitalizes on the experiences of short-term animal breeding within the framework of the SPFS implemented in SSA, with the aim of disseminating good practices through new initiatives, such as the NPFS (National Programme for Food Security) and the RPFS (Regional Programme for Food Security), as well as other agricultural development projects, including the establishment of new policies on breeding.

It describes the approach used, analyses the concepts and the methodological rationale and examines the technologies adopted. Country experiences are examined and lessons learned presented; the technological options and best practices are then analysed.

LESSONS LEARNED ON DIVERSIFICATION (LIVESTOCK) EXPERIENCES IN THE SPECIAL PROGRAMMES FOR FOOD SECURITY IN SUB-SAHARAN AFRICA

METHODOLOGICAL APPROACH

The methodological approach adopted was based on the analysis and synthesis of available documentation as well as information collected from the various countries by the author and national consultants.

The study was developed under the general supervision of the Integrated Food Security Support Service (TCSF),¹ and under the technical supervision of the Livestock Officer in FAO's Subregional Office for Eastern Africa, with the collaboration of officers from the Subregional Offices for West Africa and Central Africa.

A national consultant in Burkina Faso, Cameroon, Niger and Chad, collected the data needed for a detailed cost-benefit analysis. The data collection and analysis activities were extended to seven other countries in Central and West Africa: Mali, Togo, Congo, Gabon, Burundi, Central African Republic and Senegal.

The methodology comprised:

- the review of available documentation (see Bibliography);
- communication with beneficiaries of the breeding units, SPFS managers in charge of the diversification component, and FAO Representation Offices by telephone and/or e-mail;

- field visits to Cameroon and the Central African Republic;
- discussions with resource persons;
- the examination of reports from national consultants and analysis of data collected in the field;
- the drafting of a detailed plan for the report; and
- the submission of the first draft to the technical officer in charge.

The review and report has been prepared by Zakary Rhissa, a retired FAO Animal Production Officer, in close consultation and supervision of the responsible Officer in the Sub-regional Office for East Africa and TCSF.

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¹ Formerly known as SPFS Management and Coordination Service (TCOS).

EXECUTIVE SUMMARY



This study aims to learn from short-cycle animal husbandry experiences within the framework of the Special Programme for Food Security (SPFS) implemented in sub-Saharan

Africa in order to disseminate good practices through new initiatives, for example: the National Programme for Food Security (NPFS); the Regional Programme for Food Security (RPFS); agricultural development projects; and the implementation of new policies on livestock breeding. Furthermore, the Comprehensive Africa Agriculture Development Programme (CAADP) includes national and regional agricultural investment projects comprising livestock.

With specific reference to the “diversification” subcomponent of the SPFS, the Food and Agriculture Organization of the United Nations (FAO) has more than 10 years’ experience in setting up and monitoring semi-intensive breeding units at different levels based on the concept of sustainability and replicability; it has moved on from approaches that failed to achieve technical progress in traditional breeding in Africa. In the diversification component, the following short-cycle domestic species have been bred in semi-intensive units: small ruminants and poultry (chickens, ducks and guinea fowl). This innovative methodology has attracted the attention of various national and international donors who have provided considerable support.

This study assesses activities carried out in 11 countries of Central and West Africa: Mali, Chad, Niger, Burkina Faso, Togo, Cameroon, Congo, Gabon, Burundi, Central African Republic and Senegal. The projects are assessed to make a comparative analysis of the technological options adopted (in terms of production, feeding and marketing). Lessons have been learned and best practices identified; the advantages and disadvantages of different techniques in the light of the results obtained with local

populations (in particular, women and youth organizations in the rural and urban communities) are analysed.

The methodological approach adopted is based on the analysis and synthesis of available documentation, as well as on information gathered by national consultants and resource persons. Within the framework of the SPFS diversification component in each country studied, the issue is examined at both microproject (breeding unit) and technical level. The breeding unit is a viable and profitable small-scale farm, not only at technical, economic, social and cultural level, but also from an ecological point of view. The most highly motivated beneficiary ready for technical advancement is selected. However, favouritism is often observed in the allocation of breeding units by some local leaders. Selecting beneficiaries on the basis of technical level is the best way to allow them to advance at their own pace, according to their capacities and motivation.

Lessons learned in the implementation of the diversification component:

- With limited financial means, the participation of beneficiaries and the recognition of local potential, it is possible to implement in the field – with a dynamic of sustainable self-development – small breeding or microproject units that are technically, economically, socially and ecologically viable.
- In a context of poverty reduction, small animal breeding in rural and peri-urban areas provides an important opportunity to generate short-term income allowing beneficiaries to assume responsibilities (satisfying social needs such as health and education).
- With small units for processing livestock products at local level, it is possible to remove some marketing constraints and eliminate post-harvest losses.

LESSONS LEARNED ON DIVERSIFICATION (LIVESTOCK) EXPERIENCES IN THE SPECIAL PROGRAMMES FOR FOOD SECURITY IN SUB-SAHARAN AFRICA

MAPS OF WEST AND CENTRAL AFRICA

FIGURE 1. Sub-Saharan African countries covered by the TCOS SPFS Diversification Study

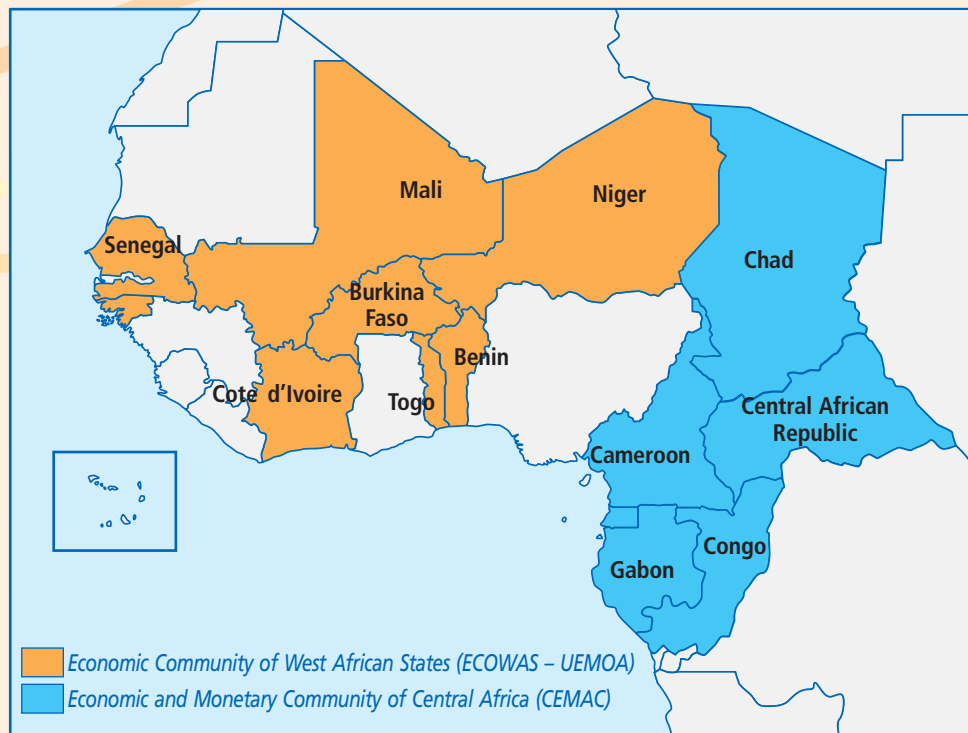
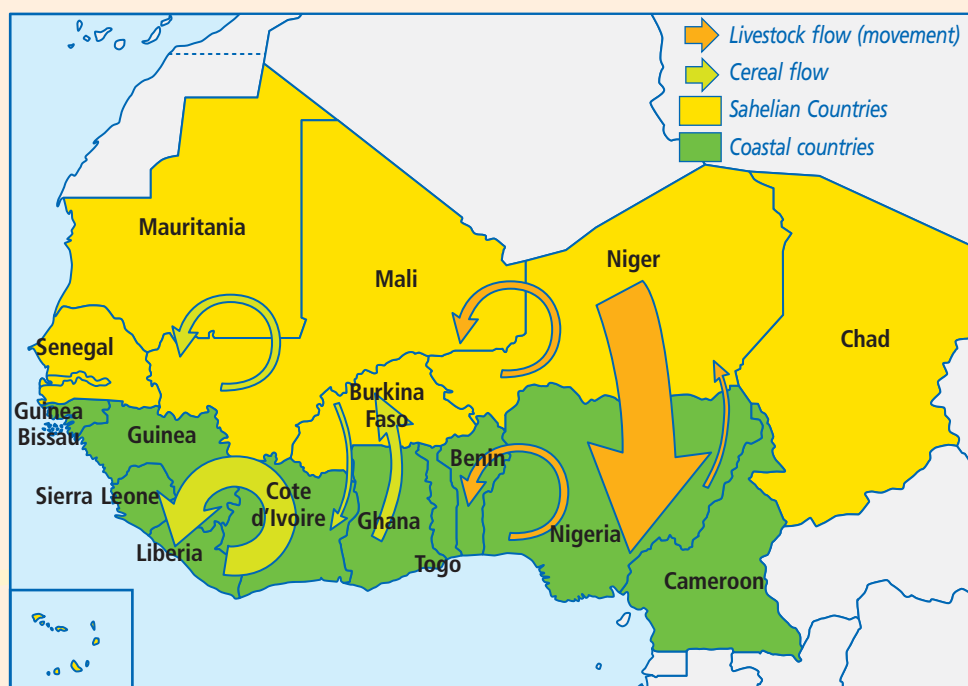


FIGURE 2. Trade flow in sub-Saharan Africa



Sources: Ruralité en Afrique FAO/CSAO/SWAC March 2007

- Synergies can be created with technical and financial partners (TFPs), given that several have already integrated the SPFS diversification component (livestock) into their poverty reduction programmes.
- The pilot breeding unit model introduced by SPFS is often reproduced using producers' own resources.
- The microproject approach and the integrated small-scale farm model (mixed units) are greatly appreciated by local populations for their flexibility and adaptation for loan repayment; a climate of trust is therefore established with respect to microcredit.
- The gradual introduction of technical progress at farm level is essential to ensure the sustainability of activities. Progress may vary as follows:
 - Level 0: family farms with dissemination actions such as extension, technical training and inputs.
 - Level 1: family farms with the introduction of technical advances and small farm management, generating the equivalent of the guaranteed interprofessional minimum wage (SMIG).
 - Level 2: family farms with the introduction of technical advances and medium-sized farm management, generating USD 100–120 per month of net income.
 - Levels 3 and 4: commercial and industrial farms eligible for loans from commercial banks or other institutions.
- Poor understanding by the actors of the clauses in contractual documents (group leaders, beneficiaries).
- Insufficient training of beneficiaries and low population growth rates (in particular, of poultry).
- Low rates of credit repayment.

Overall, the units helped small-scale rural producers obtain supplementary income, allowing them to improve their well-being and above all, to provide essential foodstuffs for their families in periods of food scarcity.

The breeding units were a success – despite the constraints associated with animal health – and led to the development of a series of agricultural and commercial activities. The units are fully integrated in the system of family production and play an important role in income growth. Even when there is a lack of local technical support, households have a wealth of know-how at their disposal that allows them to handle the constraints linked to the practices of small-scale breeding.

All the actors recognize that small breeding units contribute to the reduction of food insecurity and general insecurity. Some beneficiaries prudently use animal manure for the cultivation of other crops, in particular, market gardening crops and maize. This is consistent with the call to integrate small breeding and food crops in order to optimize the yield of agropastoral family units.

Weaknesses observed in the implementation of the diversification component:

- Inappropriate choice of beneficiaries by the village community. Populations tend to be allowed to select directly the beneficiaries; while a good thing in principle, it is important to involve local management in the process.
- Limited involvement of the decentralized technical services in the implementation and monitoring of funds management. This situation is a result of allocating responsibility to beneficiaries for management of funds granted within the framework of project activities.

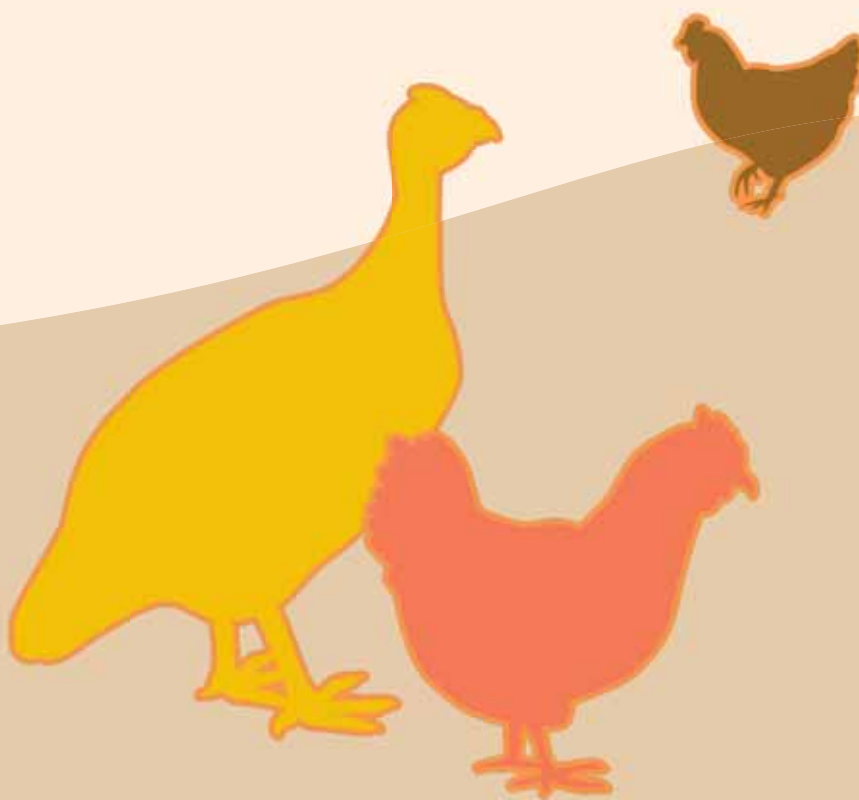
Through the analysis of the various technological options, it is possible to determine the most relevant recommendations for good practices of breeding methods to form the basis of future master plans and other action plans for development of the livestock value chains in most African countries. These recommendations are also relevant to the drafting and implementation of NPFSS and RPFSSs, as well as projects within the framework of CAADP.

The microproject approach allows different sub-Saharan African countries to develop their own strategy, making rational use of their comparative advantages, in particular: superior knowledge of local realities; know-how of the populations; adaptation of local breeds to the environmental ecological conditions; and abundant

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natural resources. For example, raising guinea fowl and developing ostrich or Canada goose breeding are potential opportunities in sub-Saharan Africa. Trade needs to be developed outside the continent, especially given the demand in developed countries for organic products.

Pilot projects must be encouraged to obtain information for the expansion of production systems in order to achieve a rapid and sustainable impact. Indeed, there are currently thousands of breeding units or microprojects financed by governments with the support of TFPs (bilateral and multilateral cooperations), the diaspora, non-governmental organizations (NGOs) and the national private sector – for example, 26 272 units in the Congo, 10 300 units in Cameroon, more than USD 64 million to the Niger and Mali.



1. CONTEXT OF THE SPFS



In sub-Saharan Africa, poverty, food insecurity and unemployment remain serious cause for concern. There is a continual drift from the rural areas to large urban centres and abroad; countries are unable to absorb the masses of youth – graduates and non-graduates – within the economic sector and public service; the education system has led educated and literate youth away from rural areas, without however, providing other prospects; those who do remain, work for just 3 out of 12 months of the year in the Sahel countries. Furthermore, in most SSA countries, poverty, food and job insecurity, irregular income and increased begging already lead to a rise in social demands and to personal insecurity for people and their property.

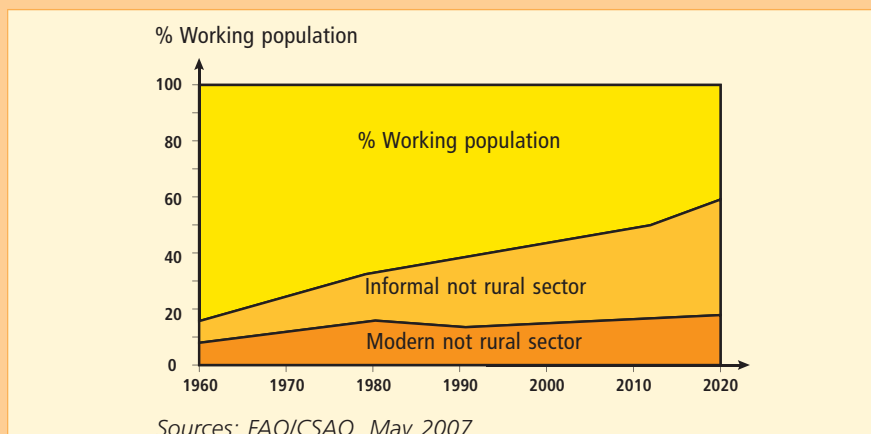
This already alarming situation is aggravated by the fact that Africa spends an enormous amount of money on importing food, particularly rice, meat, milk, eggs and frozen chicken. According to figures provided by CAADP (Comprehensive Africa Agriculture Development Programme) of NEPAD (the New Partnership for Africa's Development) (NEPAD/CAADP, 2004), over USD 18.7 billion are spent every year on importing food that Africa

could produce itself, given its own immense natural and human resources and the fact that millions of youth are currently without any future prospects.

In past strategies to improve food security and increase rural incomes, women and the young were poorly integrated into the partnership system – a lost opportunity to take advantage of what they had learned at school, promote research activities and introduce promising innovations. Development specialists often limited themselves to describing the situation and seeking the underlying causes of backward development, without ever asking “how” to implement the guidelines chosen (Omamo, 2003).

For many young people, the city seemingly offers a refuge for those seeking to improve their living conditions. The urban population is growing at a worrying rate: for example, national statistics in the Niger reveal an increase from 5 percent in 1960 to over 18 percent in 2002. In West Africa, the informal sector is currently developing to the detriment of the rural areas and, according to forecasts, it will account for 40 percent in 2020, against less than 10 percent in 1960 (Figure 1).

FIGURE 3.
Distribution of rural/economic sectors in West Africa



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Moreover, the cereal balance, which was relatively steady in SSA in the 1960s, has continued to deteriorate over the past three decades due to demographic growth, climatic fluctuations, degradation of the terms of trade and the rural exodus, but also as a result of agricultural policies which were not always able to achieve the desired balance between cash crops and food crops, or to sufficiently protect the small-scale farms that account for 90 percent of cereal production. Over the last 20 years, production in Sahelian countries has varied by around 20 percent from one year to another; southern coastal countries registered variations of around 10 percent (Thorigné and Rhissa, 1990).

The urbanization trend aggravates food insecurity. The difference between rural and urban income (ratio of 1: 4) accelerates the rural exodus, and if urbanization continues at its current pace, rural areas will have to feed an increasing number of citizens. Food needs are increasingly difficult to satisfy, hence the growing imports of rice, wheat, flour, meat and cooking oils, which tend to compensate for shortages and substitute other local productions, such as dry cereal or tubers (Thorigné and Rhissa, 1990).

Nevertheless, according to the Panafrican News Agency (PANA, 2008), "Africa can feed her children from these thousands of family farms, only if the implementation of national and regional agricultural policies that favour family farms, food chains and agro-food processing industries are advocated".

Intensification is one of the most rational ways of achieving an increase in production and productivity. However, it assumes, among other things, improved practical services for producers (research, inputs supply, credit, advice/support and training), and limited impact of natural risks (climatic fluctuations, pests, diseases) through greater control of production conditions.

Urban populations need sufficient income to purchase their food; rural populations require the financial means to feed themselves and complement their self-sufficiency. Income clearly influences access to an adequate and balanced diet. It is, therefore, necessary to improve livestock breeding in order to increase productivity and obtain more income for combating poverty and food insecurity.

It is also important to promote the emergence of new actors, particularly educated youth who are motivated and better able to handle production techniques, management, marketing and nature conservation. Indeed, the arrival en masse of educated youth could facilitate the gradual modernization of production systems in sub-Saharan countries. This is the strategy that France used by applying agricultural guidance laws in 1960 and 1962, to promote new actors in farming (Rhissa and Guernebleich, 2006).

FAO has developed response strategies and called on its full range of technical expertise to help the sub-Saharan populations exit this situation of poverty, food insecurity and unemployment.

1.1. FAO'S RESPONSE STRATEGY

In Rome, in May 1994, at the 106th FAO Council Meeting, FAO's Director-General initiated and submitted for examination the Special Programme for Food Security (SPFS); it was approved unanimously by the participating countries.

The SPFS was created to minimize the risk of failure of major investments. It has two phases: a short-term pilot phase followed by a large-scale second phase – the National Programme for Food Security (NPFS), where the largest investments are implemented. The SPFS is consistent with the development strategy of the rural sector of each country and in line with its strategic objectives.

FAO also initiated the Regional Programme for Food Security (RPFS) to fulfil the regional expectations of the World Food Summit: through coordinated efforts at all levels, it aims to increase food production and improve access to food in order to reduce the number of undernourished people in the region.

To bring about a significant change in food security, the SPFS, NPFS and RPFS require convincing results. Indeed, in March 2004, FAO's Director-General addressed the Regional Office for Africa (RAF):

One of the greatest challenges of the United Nations System in general and international organizations is to be concrete and to examine how it may be possible to change the living conditions of local populations... If we can help rural people to adopt improved seeds, to use fertilizers, to fight crop diseases, to adopt technologies for conserving and processing products, to better control breeding techniques, to fight against animal diseases, to improve the techniques for managing breeding farms, then we would truly have contributed to making our actions more concrete.

The SPFS was launched to provide concrete assistance to populations. Its philosophy is based on the following concepts:

- Rapid and visible results and generation of sufficient income to ensure the sustainability of operations and permit greater responsibility for social activities, such as health, education, and community infrastructure, in order to avoid resorting to foreign aid.
- Dissemination of proven agropastoral techniques, with the removal of obstacles or constraints that impede their adoption through a participatory and integrated approach, thus ensuring sustainability and equity.
- Better water control, intensification of agricultural production and diversification of rural activities, directly in line with the implementation of the Action Plan of the World Food Summit of 1996 and the Millennium Development Goals (MDGs) aimed at halving the number of hungry people in the world by 2015.
- A phased approach in order to avoid mobilizing very large resources right from the beginning and to create a solid basis for the SPFS programme as a whole by basing progress on the lessons learned in previous phases.

The SPFS implementation strategy:

- involves all actors concerned – rural people, animal breeders, organizations/associations of producers and

services, NGOs (non-governmental organizations), research and development institutions, and state technical and administrative services;

- uses national capacities, strengthened by technical support from FAO and by South-South Cooperation;
- rapidly sets up small concrete units (microprojects) in: agriculture (horticulture, arboriculture); small animal breeding (small ruminants and aviculture); apiculture; conservation and processing of agricultural, breeding and fishing products; and private services (auxiliaries, private veterinarians, agronomists, zootechnicians, input suppliers etc.); and
- uses the production or service units as a model for dissemination of technologies and methodologies for organizing agrosilvopastoral production, while guaranteeing the accessibility of essential technical advisory services on the basis of payment for services rendered.

1.2. RATIONALE OF THE MICROPROJECT APPROACH

The implementation strategies of the diversification component (breeding) changed from the classic approach adopted at the very beginning of the SPFS to a strategy based on microprojects or units. The new approach was based on the need to find concrete and satisfying solutions to the main constraints identified during field visits, notably:

- the low income obtained from the traditional breeding system;
- inefficient farm management;
- insufficient control of technical procedures;
- lack of credit;
- difficulties obtaining efficient technical services; and
- the low rate of dissemination of technical developments in rural farms.

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It was therefore important to design and implement production and service units (modules) in order to find concrete, satisfying and sustainable solutions to the identified constraints. The aim was to produce more at a lower cost by gradually introducing technical developments in the farms.

The application of this new approach in the field led to the adoption of principles, steps and practical methods of implementation with a view to further increasing the cost-effectiveness and sustainability of the breeding or microproject units

1.3. HYPOTHESES FOR RESOLVING CONSTRAINTS

- To ensure sustainability, initiated actions should operate independently using income earned. The unit can then assume the costs of animal health, feeding and equipment. If, after a year of project assistance, the unit continues to operate with an acceptable level of net income (approximately USD 30–40 per month), it may be concluded that the promoter is on the path to success and the activity is leading towards sustainability.
- To cover ordinary farm expenditures and obtain a monthly income of at least USD 30–40, the growth rate of the animals must be sufficient to compensate for any mortalities and to enable farmers to sell some of the stock to acquire inputs, vaccines and other medicine – in addition to the expected net income.
- To improve the animal population growth rate, the promoter must be skilled in raising young animals.

1.4. BASIC PRINCIPLES OF THE APPROACH

The approach is based on the following principles:

- **Cost-effectiveness:** Each operation or unit costing an average of USD 400–1 000 should become sufficiently cost-effective to ensure partial repayment of the support provided during a 2-year period. Repayments contribute to the operational funds of the groups or

associations and ensure sustainability of the activities. Between one and five subunits are acceptable within a group, taking into account the extreme poverty of some of the beneficiaries.

- **Gender.** At least 50 percent of units are to be managed by women.
- **Beneficiary selection.** Beneficiaries are selected by an ad hoc committee on the basis of objective criteria and specifications developed by the SPFS coordinator.
- **Lessons learned.** Lessons learned from previous projects should be capitalized on.
- **Repayment.** Investments are granted for several years, in kind (animals) or cash, according to the cost-effectiveness of the project; social pressure in the village encourages repayment so that other farmers in the group may benefit.
- **Village management.** A village committee supervises to optimize existing structures and the community savings and loans networks.
- **Progress according to technical level.** Beneficiaries are selected on the basis of their level of technical expertise to encourage actors in the animal breeding sector to become more professional. Level 0 (base level), Levels 1 and 2, then Levels 3 and 4 (where the beneficiaries are already professionals potentially eligible for loans at commercial banks).

1.5. RECOMMENDED MODULES OR UNITS

On the basis of the breeding conditions in the different countries and in view of the above principles, various modules or breeding units were recommended.

Module 1: Guinea fowl breeding (Level 0)

Guinea fowl breeding starts at the basic level (Level 0). Potential beneficiaries compete in several villages, 20 candidates per village (10 men and 10 women) paying a nominal fee of USD 12–15 (around CFAF 6 000). This amount enables each candidate to buy 2 hens, 30 guinea

fowl eggs and veterinary products, and to ensure their care. Candidates with 15 live guinea fowl at the time of the results assessment receive an average grade of 10/20, and may aspire to a higher level.

Module 2: Guinea fowl breeding (Level 1)

The best candidates from Level 0 are selected for Level 1, and they receive a loan of USD 400–700. The starter population consists of 36 female guinea fowl, 9 males and 10 local hens plus an improved rooster. The livestock is kept in a small area (30 × 20 m), completely fenced in and containing two poultry houses and resting sheds. A good aviculture farmer can be expected to achieve a net monthly income gradually increasing from CFAF 17 800 to 22 600, to eventually reach CFAF 32 500 (deducting amortizations, operational expenses and loan repayments). The loan should be repaid over 3 years, with a 1-year grace period. If successfully developed, this activity can launch a guinea fowl production sector capable of supplying urban centres with meat and eggs.

Module 3: Pigeon breeding

Pigeon meat is much appreciated and this module aims to improve its supply to urban centres via the following activities: purchase of adult pigeons; preparation and distribution of feed; vaccination and care; and construction of a pigeon house using local materials and equipped with a pottery drinking trough and nests. The unit comprises: 40 pigeons; 100 cages; materials to construct the dovecots; basic equipment; feed supplements; and products for veterinary care.

Module 4: Layer hen unit

The starter unit comprises 50 layer hens (bought when 4 months old from a supplier), a production and breeding building plus the necessary supplies. The animals are kept for 12 months, at the end of which time they are culled. Annual production is 230 eggs per hen. Sales should allow the beneficiary to gain a net monthly income of CFAF 17 714 and to purchase the subsequent lot.

Module 5: Broiler chicken unit

The unit has an initial population of 225 broiler chicks kept in a building constructed using local materials. The production cost per broiler chicken unit is estimated at CFAF 619 750. Sales will earn the producer a monthly income of approximately USD 145.

Module 6: Sheep unit

The sheep breeding unit typically consists of: 10 ewes and 1 ram (Bali-Bali or Ouda), 1 sheep pen and 1 shed for storing fodder and breeding equipment. However, in consideration of the extreme poverty of some beneficiaries, up to 5 subunits are acceptable within one group. The unit cost is CFAF 276 375, repayable over 3 years at a 10 percent interest rate. Additional income is generated from the sale of animals, and units therefore include small ruminants (sheep and goats of large local breeds such as Bali Bali or Mouton Ouda) to be sold at Tabaski feasts or used for milk production or export. The males are sold after fattening and all efforts must be made by beneficiaries to properly feed the animals.

FIGURE 4.
Guinea fowl breeding unit, level 1 (module 2)



FIGURE 5.
Layer hen unit (module 4)



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Module 7: Goat unit

The unit consists of 10 goats and 1 billy goat of a breed adapted to local conditions, as well as a goat barn/shed for storing fodder and breeding equipment; there may be up to 5 subunits. The aim of the unit is to provide sufficient resources to satisfy the basic needs of the beneficiaries. The cost of the unit is CFAF 275 000, repayable over 3 years at a 10 percent interest rate. The beneficiary's contribution is made in kind: animal feed, breeding equipment and construction of lodging. The expected result is a net profit of CFAF 15 500 per month.

Module 8: Pig unit

The starter unit has 2 sows and 1 boar. The habitat consists of 1 hog house with 3 compartments. The cost is estimated at CFAF 630 000. By the end of the first year, one unit should yield a monthly income of around CFAF 46 750. Loan repayment is from the second year, at a rate of CFAF 100 per month.

Module 9: Milk production

This operation aims to promote the creation of economically and ecologically viable farm units comprising a milk production option. It is also a way of integrating and developing rural youth organized in Economic Interest Groups (EIGs) in their territory. An EIG receives the cows and a full animal traction unit, together with technical support and supplies to ensure adequate agrosilvopastoral integration. This is an important diversification activity as it improves the local feed of the animal populations, while starting intensification of breeding where possible, taking into account increasing

national demand. Intensification is also a means to limit uncontrolled animal roaming on the plots.

This activity is effective with a 4-member EIG, each member bringing 2 cows – i.e. a total of 8 milk cows. Assistance for this module comes in two forms: provision of the sire/breeder of the local milk breed (i.e. Azawack, Kouri or Goudali) and financial support to construct the stable, purchase equipment (donkey cart), and provide technical monitoring and supplementary feed for a period not exceeding 3 months, for a total cost of USD 2 000 (four units at USD 500 per beneficiary, or USD 2 000 per EIG).

Module 10: Harnessed traction service units

This activity strengthens the farmers' working capacities and contributes to reducing the work burden. It ensures the transportation of harvest and inputs. Activities are carried out by acquiring, with a loan, a pair of oxen, a cart and a plough, for a total of USD 1 750 (CFAF 750 000), repayable over 3 years.

Module 11: Mixed agrosilvopastoral units

This mixed unit is a 1.5-ha farm enclosed by a hedge and barbed wire fence. The total cost is CFAF 11 450 935, of which CFAF 269 125 are payable by the beneficiary. The unit comprises: a garden and fruit crops; a well; an irrigation system with a 3.5-hp motorized irrigation pump; and a stable for small ruminants (3 ewes and 1 Bali Bali ram, or 3 goats and 1 billy goat) or a 30 × 20 m enclosed space with a chicken coop (for 16 female guinea fowl, 4 ewes, 5 hens and 1 rooster). Horticulture production includes mangos and citrus fruits, as well as onions, cole

FIGURE 6.
Sheep breeding unit, level 1 (module 6), in Niger



Photo: Z. Rhissa

FIGURE 7.
Harnessed animal traction unit (module 10)



Photo: Z. Rhissa

crops, potatoes, sweet potatoes, tomatoes, sweet peppers and lettuce. The farmer selects his/her own combination, but must respect the relative technical specifications. Animal production consists of guinea fowl eggs, guinea fowl, hens or sheep/goats for sale. Finally, in rainfed crops, cowpea is produced to improve farm yield. This requires setting up cost-effective models of 1–1.5-ha small-scale farms with educated young people to carry out the agricultural, livestock and agroforestry activities. The cost of the unit does not exceed USD 3 000.

Module 12: Animal health units (Level 2)

This type of unit is set up where there are a number of units established by similar projects. The beneficiary is chosen from the model producers with the best recorded results. The aim is to transform the beneficiaries into frontline advisory agents for breeding farms in their villages and the surrounding areas, by strengthening their operational capacities through training, providing them with a kit of small project supplies and an initial stock of essential veterinary products. The cost of an animal health unit is CFAF 267 500. The expected monthly income is CFAF 82 667.

Module 13: Basic technical support services

These are units called on to ensure a community support service (breeding assistance) and a point of contact for private or public veterinarians. The beneficiary is taught to carry out simple interventions, such as vaccinations, under the supervision of a veterinarian. First-aid medicines are provided, as well as breeding inputs to assist in basic-level traditional breeding (Level 0). The estimated cost of the unit is USD 500.

Module 14: Aulacode unit

The requirements are: a nucleus of 4 females and 1 male; construction of an aulacode unit; purchase of supplementary feed; and support for veterinary care. The total cost of the unit is CFAF 436 000. The estimated monthly income is CFAF 25 375. Repayment of the loan is based on CFAF 123 000 per production cycle.

Module 15: Rabbit unit

Each unit starts with 5 females and 1 male. The animals from the breeding of this nucleus may be used for reproduction or meat. The cages are kept in a building made from local materials. The cost of a unit is estimated at CFAF 379 000, while the expected monthly income is

CFAF 33 583. The loan is paid back over 3 years at a rate of CFAF 102 300 per marketing cycle.

Module 16: Processing milk into dry cheese

The process of transforming milk into dry cheese (Tchoukou) aims to limit milk losses during the rainy season when overproduction is common in many areas; the activity is accessible to most women. FAO has contributed to improving this traditional technology in several countries. The improved process is to be extended through training sessions inclusive of kits at an overall cost of CFAF 200 000.

FAO also promotes small artisanal units with a low processing capacity, comprising a workspace and the small pieces of equipment needed to process milk into cheese. Costs are calculated on the basis of a daily production of 2 kg of cheese and 75 bags of yogurt, i.e. a daily requirement of 30 litres of raw material (milk). The cost of a unit is CFAF 1 066 000, and the expected monthly income CFAF 60 722. Repayment at an interest rate of 10 percent is over a 2-year period at CFAF 40 060 per month. The loan may be deferred for 1 year.

Module 17: Processing of hides and skins

The operation provides groups of traditional tanners with working capital and modest equipment to launch their activities, and provides support in terms of organization and access to income-generating markets. Therefore, each group receives a loan of CFAF 50 000, repayable at a rate of 10 percent, to construct a good capacity basin made of durable materials, and a further CFAF 150 000 to cover operational costs, the purchase of raw materials, various inputs and local marketing expenses. The expected monthly income at group or family level is CFAF 242 700 and, once operative for 6 months, full repayment should be made at a rate of 10 percent. The operation can therefore extend to new beneficiaries as early as the second semester of the same year.

Module 18: Butcher shop and deli unit

The unit comprises: a wooden kiosk; a refrigerator for meat conservation; and various small supplies – scale, weights, knives, apron etc. The unit functions better if connected to the city's power network. Its cost is estimated at CFAF 885 000, with an expected monthly income of CFAF 1 023 375. Repayment is at an interest rate of 10 percent.

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Module 19. Trade unit

The objective is to enhance the professionalism of avian marketing networks and to guarantee market opportunities and better income for guinea fowl producers. The unit provides a young operator with a substantial fund for streamlining, stabilizing and even increasing his/her activities with the technical advice of the project management. The beneficiaries provide their contribution with logistics, while the operational and equipment costs amount to CFAF 210 000. With the increased turnover, a monthly income of CFAF 167 000–273 000 may be expected. The loan plus interest could be paid back 1 month after the 6-month deferral period, allowing another beneficiary to be launched right away.

1.6. PRACTICAL IMPLEMENTATION STEPS AND METHODS

1.6.1 Implementation

- Preparation of the operation plan by a multidisciplinary team on the basis of field mission results.
- Beneficiary selection by the village community and validation of this choice by the SPFS coordinator (for Level 0); selection on the basis of results obtained (for Levels 1 and 2).
- Training and awareness-raising of beneficiaries.
- Repayable loan (project contribution) to assist in purchasing supplies, equipment and breeders, as well as food and medicine for a 3-month period.
- Technical monitoring during implementation, based on a 3-month contract.
- Choice of feeding method, using natural pastureland and food found locally.
- Drafting and signing of a memorandum of partnership agreement between the project and the village association, officially endorsed by the local authorities.
- Monitoring and evaluation.

1.6.2. Objectives

The principle objectives of the livestock component are as follows:

- job creation;
- introduction of techniques to promote local and national development;
- self-development of local populations;
- rapid extension of the microproject models developed,
- provision of alternative income for young/retired people and women lacking resources.

1.6.3. Site selection criteria

A series of criteria are adopted in order to select the most suitable sites:

- accessibility;
- motivation of beneficiaries;
- proximity to potential market;
- potential to promote economic dynamism;
- access to essential technical services;
- suitability as a model; and
- promotion of specific potential.

1.6.4. Fact sheets

Fact sheets to be prepared come under a variety of headings, for example:

- Improvement of family aviculture
- Promotion of guinea fowl breeding
- Sheep breeding and fattening
- Apiculture
- Processing of milk products
- Meat processing
- Processing of agricultural products (wheat, maize, market garden products)
- Service unit (bovine or camel traction)
- Pigeon breeding
- Goat breeding
- Prophylaxis plan for village aviculture
- Feeding protocols
- Prophylaxis plan for small ruminants

- Training plan for auxiliaries and beneficiaries
- Advisory services contract

The fact sheets are 4–5 pages long and are organized under the following headings:

- Title
- Location
- Background
- Purpose of microproject: issues
- Constraints, potentials
- General objective
- Planned activities (technical and organizational)
- Necessary means (investment)
- Expected results (calculation of profitability)
- Methods of investment repayment
- Assessment and success criteria
- Proposals for extension

1.6.5 Support measures

- Provide infrastructure and equipment (small slaughtering houses, wells, fodder, water supply system, electricity, communications, transportation).
- Adapt loans to the local context.
- Make community technical support services accessible to farmers.
- Provide qualified training for beneficiaries and management.
- Organize beneficiaries in production sectors to ensure better marketing of products and adequate supply of inputs.

1.6.6 Practical methods of monitoring and evaluation

To gather field data for the monitoring and evaluation of programme activities, four assessment forms were developed:

- Beneficiary identification
- Production monitoring
- Repayment monitoring
- Impact assessment

Monitoring and evaluation are carried out by several actors:

- The beneficiary is responsible for the daily monitoring of the farm and for updating basic monitoring documents.
- Service providers make twice monthly visits during the first 6 months, in order to ensure zootechnical and sanitary monitoring of the unit. A monthly report is produced for submission to the project coordination and the decentralized service of the livestock development ministry. At the end of this initial period, it is incumbent upon the owner of the farm to negotiate the various clauses of the contract.
- The coordination unit of the SPFS and the decentralized service of the ministry for breeding conduct a supervisory mission of the units every 2 months.

1.7 TECHNOLOGICAL OPTIONS

The technologies adopted vary according to the agro-ecological conditions of the country and concern zootechnical, economic and financial data.

BOX 1. TECHNICAL LEVELS

- **Level 0: Family farms with widespread activities including extension and technical training; generate a monthly income of CFAF 2 000.**
- **Level 1: Family farms that have introduced technical progress and small farm management; must yield an equivalent of the SMIG (guaranteed minimum interprofessional wage) (CFAF 15 000–20 000).**
- **Level 2: Family farms that have introduced technical progress and medium-sized farms; must yield a monthly net income of CFAF 62 500 (USD 100–120).**
- **Levels 3 and 4: Commercial and industrial farms eligible for loans at commercial banks or other institutions.**

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1.7.1 Traditional rural aviculture (Level 0)

This is the oldest method of raising poultry: in almost all families in rural and peri-urban areas of SSA, there are a variable number of backyard birds in each concession, usually raised by women and children. The birds find their own food and do not receive any veterinary care; after roaming, they return to the concession to spend the night in a makeshift enclosure, perched on the branches of trees or in the corner of the kitchen, sharing the same room as the occupants of the home.

A hen flock comprises 5–10 heads. Their zootechnical performance reflects the limited attention they receive, and losses are heavy: of 10 chicks born, an average of 6 are weaned and 3–5 reach adult age; losses of 100 percent are not rare. The hen lays eggs at around 5 months. She lays a series of around 10 eggs, out of which a clutch of at least 8 chicks are produced, i.e. a hatching rate of 80 percent. The interval between clutches is 3 months; however, this could be reduced with good feeding and early withdrawal of the chicks, leading to a greater number of egg-laying series (normally 4 per year).

Guinea fowl reproduction is seasonal and takes place only once, usually in the rainy season between March and October. Reproduction begins at around 9–10 months, but can occur earlier if the animal is well nourished, leading to production of 80–100 eggs. The guinea fowl is a poor layer and a poor breeder; it is preferable to entrust her eggs to a hen that can sit on 20–25, depending on whether they are light or medium-heavy. The hatching rate depends on the age of the eggs, but is generally around 70–80 percent. A ratio of less than 1 male to 3 females negatively affects fertilization.

In traditional rural aviculture, collectors tour the itinerant and regular markets, selling their birds to wholesalers from the city, who in turn sell to retailers. The village hen has an important sociocultural role. Traditional rural aviculture has for a long time been the poor relative of the breeding subsector, from the point of view of both genetic resources and production systems. Efforts tend to concentrate on the genetic improvement of local hens and protection from adverse weather and predators.

Genetic improvement began in the 1960s, when throughout SSA local chickens were crossed with Rhode

Island Red (RIR), an improved strain. The aim was to substitute local varieties with the heavier crossbreed to obtain both larger birds and increased egg laying. The ultimate objective was for the production of the derived stock breed to be close to the performance of the improved stock. However, there was no clearly defined programme and the resulting genetic material was rapidly diluted; as a result, it was not possible to achieve widespread dissemination. Moreover, the systematic elimination of the village roosters was not well received, and there was competition between the improved and the local males. Traditionally, there is negative selection, as the most beautiful birds are sacrificed in religious ceremonies and at fairs, or in honour of guests.

Rural family aviculture has relatively low productivity: 11.5 kg of meat and 0.6 eggs/day per breeding female per year. The monthly income is CFAF 2 000–8 000, which is not sufficient for a traditional breeder to assume feeding and veterinary costs or to pay for a decent habitat. The veterinary technical services are insufficient to ensure sustainable health monitoring of breeding farms, in particular vaccinations, disinfestations and feeding and breeding advisory services. Nevertheless, traditional rural aviculture continues to be widely practised in all poor areas of the rural and urban environment, because it requires no investment and the benefit-cost ratio is very high. The system operates by itself.

TABLE 1. Financial results of traditional poultry farm

PARAMETER OF PRODUCTIVITY	
Meat production/hen/year (kg)	11.5
Egg production/hen/year (kg)	0.6
Net farming results (CFAF)	
Cost price of hen at farmgate	198
Cost price of egg at farmgate	6
Net margin per hen	1 600
Net margin per egg	50
Net income generated/breeding female/year	9 600

1.7.2 Family aviculture

Level 1

Level 1 family aviculture is applicable to farms that:

- have introduced technical and management progress;
- yield an amount equivalent to the SMIG (CFAF 15 000–20 000); and
- require a minimum investment of USD 500–600 (CFAF 250 000–300 000), repayable over 3 years.

i) Chicken unit

This unit has a starting population of 20–40 hens and 2–5 breeding roosters (imported breed). The breeding infrastructures contain 3 poultry houses (1 brooder house, 1 house for breeders, 1 for fattening) and an enclosed chicken run. The fence is a major innovation as it prevents the bird from roaming. The monthly income that must be generated per Level 1 chicken unit is CFAF 22 771.

TABLE 2. Operating account for Level 1 poultry units (CFAF)

	CYCLE 1	CYCLE 2	CYCLE 3
Products - Sale of chicks - (340 x 475)	161 500	161 500	161 500
Total	161 500	161 500	161 500
EXPENSES			
Building amortization	6 666	6 666	6 666
Supplies amortization	3 373	3 373	3 373
Feed	30 916	30 916	30 916
Veterinary products	15 462	15 462	15 462
Poultry amortization	7 000	7 000	7 000
Labour	7 000	7 000	7 000
Total	70 417	70 417	70 417
Result per cycle	161 500 – 70 417	= 91 083	
Annual income	91 083 x 3	= 273 249	
Monthly income	C FAF 273 249 : 12	= 22 771	

ii) Guinea fowl unit

The guinea fowl starter unit has a nucleus of 39 female guinea fowl, 9 male guinea fowl, 10 local hens and an improved rooster. The breeding infrastructures are identical to those used in the chicken units. Expected annual production in a stable year is 500 broiler guinea fowl and 2 100 eggs for consumption. The sale of this production should allow beneficiaries to yield a monthly income of CFAF 37 104.

TABLE 3. Summary of expenses (in CFAF) for Level 1 units (guinea fowl)

CATEGORY	SPFS	BENEFICIARY	TOTAL
Poultry house	30 000	70 000	100 000
Guinea fowl purchase	40 500	20 250	60 750
Veterinary products	34 000	16 815	50 815
Feed	90 000	126 418	216 418

iii) Turkey and duck unit

This unit begins with an initial population of 6 females and 2 males, kept in facilities consisting of a brooding house, a feeding site, another site for breeders and an enclosure. Production costs are estimated at CFAF 195 600. The estimated annual production is 40 fattened turkeys, the sale of which brings the producer a monthly income of around CFAF 74 552.

Level 2

The expected minimum monthly income is CFAF 62 500–65 000 (USD 115–120) for a minimum investment of USD 1 000–1 200. A successful outcome helps revitalize existing local potential, especially in cereal cultivation. Level 2 already represents a considerable advancement towards professional breeding.

1.7.3 Traditional sheep and goat breeding

Sheep and goat breeding is an important income-generating activity in rural households. The animals make the best use of the rural space and poor grazing areas, as well as crop waste and residue. The activity is very popular in some SSA regions.

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TABLE 4. Operating account of sheep-breeding farms, Niger

LAST NAME, FIRST NAME	EXPENSES (NOT INCLUDING AMORTIZATION)	REVENUE + (SALE OF ANIMALS AND RESIDUAL VALUE OF THE HERD)	PROFIT
SHEEP BREEDING FARM			
Beidari Hamidou	317 800	642 500	324 700
Idrissa Djibo	331 850	470 000	138 150
Salleye Seidou	285 250	370 000	84 750
Djibo Issa	394 700	420 000	25 300
Mariama Samba	454 200	742 500	288 300
Hassane Mamoudou	347 450	848 500	501 050
Hadjo Samba Djibo	389 000	680 000	291 000
GOAT BREEDING FARM			
Niandou Inoussa	447 000	684 500	237 500
Gambina Souley	385 000	565 000	180 000
Dari Ibrahim	394 950	590 000	195 050

Source: FAO 2009.

The traditional breeding system is mixed (small ruminants, pigs, poultry etc.). In the dry season, the animals are left roaming with very limited support from agricultural subproducts (ASPs). During the rainy season, on the other hand, the animals are usually fenced in order to prevent food crops from being destroyed; mown and dried hay is provided, as well as water (often via a hydraulic infrastructure), or they are taken to graze by shepherds.

As a result of the reduction in natural pastureland (due to climate change and the expansion of built-up areas under the burden of population growth), feeding is becoming a challenge for animal breeders. In the dry season, natural pastureland no longer provides good quality fodder; natural weeds are reduced to straw or destroyed in bushfire.

Production costs are so low as to be insignificant. Animal maintenance costs are estimated at CFAF 2 355; they include building shelters (32.5%), purchase of mineral supplements (34%) and veterinary medicines (13.3%), and vaccination fees (20.5%).

1.7.4 Improved traditional sheep and goat breeding (Level 1)

The unit comprises a start-up nucleus of 5–10 females and 1 male. The habitat consists of a pen, with a courtyard and a shed; there is a drinking trough and a feeder. The cost is around CFAF 182 000 (USD 423).

The objective is to increase productivity and obtain a higher income from the sale of both animals (sheep and goats) and milk (goats). The microproject farm guarantees the producer a monthly income of CFAF 33 917.

In sheep fattening, the average yield obtained per beneficiary in the Niger from two operations in 2 years is around CFAF 106 260. The average profit calculated for three units (using relatively reliable data) is CFAF 149 350. It is not possible to estimate the time required for fattening nor, therefore, the average monthly profit.

1.7.5. Improved sheep and goat farming (level 2)

An improved Level 2 breeding model was developed and disseminated in Togo in 1985. The system takes into account breeding practices and the hostile environment

to animals (climate, disease). The yields of the herds raised under this system have largely surpassed those of traditional breeding. The model is based on the following points:

- Construction and fitting out of a night paddock (pen).
- Appropriate feeding to satisfy the animals' needs, i.e. leading the herd to pasture for 8 hours a day, providing supplementary feed (from mid-July to the end of October) and minerals, and ensuring the daily provision of sufficient water.
- Animal health protection: annual vaccination against goat plague; treatment for internal and external parasites; and improved hygiene.
- Use and renewal of improved breeders.
- Organization of daily farm work to promote the integration of breeding and food crops.
- Establishment of a plot of shrub legumes for fodder (*Leucaena leucocephala*, *Cajanus cajan* etc.).
- Monitoring of technical-economic results.

There was an average of close to 70 heads per herd, with an average of 30 to 35 ewes; the largest breeding unit kept 50 to 80 ewes.

1.7.6 Traditional pig breeding (Level 0)

Women are by far the most active in traditional pig breeding. The income yielded barely allows them to improve their daily meals, schooling and clothing, or care for their sick children.

There are a number of constraints, including:

- low productivity and low prolificacy of the animals raised;
- poor feeding;
- lack of breeding infrastructures;

- accidents and diseases resulting in losses;
- endemic African Pig Disease (for which there is no vaccine);
- inability of financial systems to support the development of breeding activities; and
- poor technical management capabilities of breeders.

1.7.7 Improved pig breeding (Level 1)

A starter unit includes 2 sows and 1 boar. The habitat comprises 1 hogg house with 3 compartments. The unit cost is estimated at CFAF 455 950; it should generate a monthly income of around CFAF 20 669 by the end of the second year.

1.7.8 Aulacode breeding

This is a very recent enterprise resulting from changing dietary habits in SSA. Aulacode meat reaches high prices, making the activity very cost-efficient: it provides a source of income to combat poverty and contributes to ending food insecurity.

Raising aulacodes is of increasing interest to peri-urban and rural populations: breeding is easy and can be carried out by women and children; it leads to job creation and produces income. The reproduction cycle is similar to that of small ruminants with a gestation of 5 months. An aulacode unit contains 10 females and 2 males and costs around CFAF 600 000. The potential income is CFAF 46 322 in the first year, CFAF 146 322 in the second year and CFAF 173 135 in the third year. A producer's logbook reveals a recorded income in Burkina Faso of USD 443. One aulacode producer in central Burkina Faso is a model of success: from a starting population of 15 heads, within a short period, there were over 150 heads (60 breeders, 30 adult feeder males and more than 60 pups); over 450 animals were sold. Aulacodes that reach 5 kg in 10 months are sold for CFAF 5 000/kg live weight and CFAF 3 000 per kg of carcass. Breeders are sold at 3 months (females) and 4 months (males) at CFAF 20 000 per head.

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1.7.9 Technical support services

Since the 1990s, several countries have undergone privatization of the veterinary profession, affecting the sale of inputs, veterinary practices themselves, and the implementation of certain state mandates (e.g. livestock vaccination). Legislation (particularly ministerial decrees) allowed professionals to set up private practices and carry out profit-making activities; as a result, the state services are increasingly directed towards monitoring. The technical support services have the following shortcomings:

- shortage of human resources;
- insufficient means for operations and transport; and
- lack of materials and products.

Producers' demands are therefore not met, mainly because of the community services' inability to provide rapid, efficient and economical interventions and good quality products at a fair price (unfortunately, paraveterinary project-trained auxiliaries have been known to act officiously and illegally).

However, these shortcomings may be overcome at regional level, where there are authorized veterinarians, young unemployed high school graduates and uneducated young people. With appropriate organization, these categories of personnel could constitute a response to the need for technical support. If the resources of auxiliaries and breeders are combined, private initiatives can reach a greater number of beneficiaries. However, there are constraints to setting up private initiatives, notably: lack of financing (since it is not easy to satisfy the conditions of the financing institutions); and lack of equipment for already-existing private initiatives.

Implemented actions

At technical level:

- Selection of promising private initiatives.
- Provision of support for setting up private initiatives – opening up a file, management training etc.

- Negotiation of a contract with practising private veterinarians.
- Selection of auxiliaries by producers.
- Recruitment by private veterinarians of unemployed youth and paraveterinarian auxiliaries.
- Purchase of zootechnical equipment and inputs.
- Provision of support to the sponsor through technical training (in the clinic) and training in stock management and accounting.
- Training and recycling of auxiliaries in order that they may: manage and sell inputs; provide basic medicines to animals; carry out disinfestations and vaccinations; administer non-dangerous innocuous products; and perform certain zootechnical operations (castration, weighing etc.). They must act as a liaison between the private veterinarian and the producers.
- Training of breeders in concepts such as animal health and breeding techniques.
- Building-up stocks of medicine by the private veterinarian on the basis of the producer's needs.

At organizational level:

- Awareness-raising of beneficiaries with regard to services provided and potential benefits.
- Planning of technical activities.
- Establishment of relations between private initiatives and beneficiaries.
- Scheduling of monitoring of the breeding farms.
- Acquisition of location/shop.
- Creation by private veterinarian of a network of auxiliaries to act as a liaison between the veterinarian and the breeders.

The estimated cost for setting up a private technical support service unit is around USD 1 300, with an annual profit of around USD 1 140.

1.7.10 Yogurt factory unit, Gao (Mali)

The women's association of Gao, SONGHOÏ NAFA, whose members are women homemakers or traders, promotes this yogurt-manufacturing unit. The urban agglomeration of Gao consumes a large quantity of milk and milk products. Curdled milk is in great demand and is produced artisinally by women using milk powder. Breeders have set up small milk farms in the peri-urban area of the town and some have even begun to crossbreed local cattle with the Montbéliarde breed using artificial insemination. The milk production units are successfully sustained thanks to the production and marketing of bourgou (local grass) and the supply of fodder crops from Bamako or Koutiala. The financing plan of the unit is shown in Table 5.

The implementation and monitoring of this unit demonstrates that the establishment of small cost-effective milk shops in smaller towns can be to the benefit of the population.

1.7.11 Animal traction

The level of mechanization achieved in most SSA countries, particularly with regard to animal traction, is relatively low, despite the considerable potential of draft animals, the availability of agricultural land and the efforts of all actors concerned. A unit costs around CFAF 750 000 (USD 1 750). Animal traction needs to be made accessible to rural people, especially the most underprivileged as it offers numerous advantages, including:

- increased respect for crop schedules;
- agricultural-livestock integration (bulls produce manure to compensate for the generally dry fields);
- employment opportunities (a donkey cart or bovine traction can be used for service provision, transportation of agricultural products from the field

to the village and from the village to the markets, transportation of firewood, adobe, sand, gravel etc.)

- a potential source of revenue (by contributing to agriculture-breeding integration, it increases the potential income of service providers).

TABLE 5. Financing plan of yogurt unit, Gao (Mali)

CATEGORIES	TOTAL	BENEFICIARIES	SPFS	
Equipment	425 000	25 000	415 000	400 000
Milk for one month	180 000	90 000	90 000	40 000
Packaging for one month	42 000	–	42 000	30 000
Sugar	45 000	15 000	30 000	25 000
Yogurt	56 250	18 000	38 250	20 000
Vanilla sugar	9 000	9 000	–	–
Aromatic flavour	15 000	15 000	–	–
Total	772 250	157 000	615 250	515 000

2. REVIEW OF ACTION IN 11 COUNTRIES



This chapter provides a brief review of activities carried out within the framework of the implementation of the diversification component in 11 Western and Central African countries (in chronological order): Burundi, Central African Republic, Congo, Gabon, Togo, Senegal, Burkina Faso, Cameroon, Mali, Niger and Chad.

2.1 BURUNDI

On 31 January 2001, the project TCP/BDI/0168, “Support to agricultural diversification within the SPFS”, was approved with a budget of USD 320 000. The programme implemented an agrosilvopastoral approach suited to the agroclimatic context of Burundi.

BOX 2. TCP/BDI/0168

Results:

- Reconstitution of about 80 percent of livestock in the demonstration units, achieved by reducing the mortality rate (particularly of young animals) and improving zootechnical performance.
- Creation of an animal distribution network within the unit, to operate in the neighbouring hills through the solidarity chain initiated by project BDI/97/006 and managed entirely by auxiliaries.
- Translation (into Kirundi and French) and distribution of technical notes (covering training and demonstration) to accompany all the operations planned.
- Formation of associations (comprising 60 percent of producers): demonstration sites with access to 4 village pharmacies; 4 veterinarian auxiliaries trained and operational (24 in total); women represented in all the associations and accounting for at least 50 percent of the auxiliaries.
- Implementation of demonstration activities for improving techniques in all sites, applied by more than 50 percent of farmers.
- Creation of a network of 24 assistants and 6 rural multipliers of plants and fodder seeds (operational to date).
- Distribution of at least 150 kg of fodder seeds and more than 50 000 fodder shrubs to farms; establishment of a mechanism for dissemination of plant material.
- Establishment of an autonomous network – service providers, advisory and supply services, product distribution, agricultural and breeding inputs – through grassroots associations, auxiliaries, focal agents of public services (area assistants and agronomists of the communes) and private suppliers.
- Creation (thanks to the providers of a private veterinary service under contract with FAO-SPFS) of an independent system (operational to date): the private veterinarian supports auxiliaries and supplies village pharmacies initiated within the SPFS framework; there are currently 20 employees in the country.



- Implementation of revolving funds to acquire products and inputs for livestock, operational via contractualized management between associations and their veterinarian auxiliary on each demonstration site.
- Establishment of a monitoring-evaluation mechanism completed by the technical and economic performance indicators.

2.2 CENTRAL AFRICAN REPUBLIC

In February 2002, the Government of the Central African Republic and FAO signed the project document of TCP/CAF/0171 (D), "Support to the implementation of the intensification and diversification components of the SPFS", with a budget of USD 382 000. The project aimed to improve living conditions and production in rural areas, making better use of South-South Cooperation. Recurring political-military troubles and insecurity led

to the suspension of activities in October 2002. With the gradual return to security as of June 2003, it was possible to recommence the project. In July 2007, the Government of the Central African Republic expressed

interest in developing a second project to capitalize on the positive results of the first. TCP/CAF/3102, "Support to the implementation of a pilot programme on post-conflict economic reintegration", was therefore approved by FAO with a budget of USD 330 000.

BOX 3. TCP/CAF/3102

Objectives

- Identify operations relevant to a much larger investment programme for the sustainable relaunch of the main livestock market chains aimed at post-conflict reintegration.
- Prepare for the advent of new kinds of actors in the livestock breeding sector (promotion of rural entrepreneurs, conversion of officers on voluntary leave, development of viable agrosilvopastoral farming models).

Results

There is extensive interest in replicating the successful activities in the Central African Republic related to the fight against poverty and food insecurity and to job creation. Development partners include the European Union (EU, estimated budget > EUR 5 million), United Nations Development Programme (UNDP, budget EUR 3.2 million), World Food Programme (WFP, within the framework of its "Food for Work" Programme) and China (for the supply of equipment and materials). The programme is ongoing and will reach the extension phase.

Conclusions

The most recent supervisory visit highlighted various problems, in particular with regard to unit establishment, but it also revealed a very positive reaction among the local populations of Bouar, Bangui, Boali, Baité and Banbari. The different models tested could be used as a basis for reintegrating more than 8 000 former combatants with financing from the EU and UNDP through FAO.

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2.3 CONGO

On 7 June 2003, the Government of the Congo and FAO approved project TCP/PRC/2904. The objective was to promote at village level the breeding of short-cycle livestock (sheep, goats and poultry) at six sites over a period of 24 months. The activities were effectively implemented at five sites. Support was given to livestock farmers to construct breeding sites and implement breeding units. A total of 58 sheep/goat pens and 60 small poultry houses were built using local materials.

In 2004, the initial implementation strategy of the units was assessed in order to introduce peri-urban units in Ignié (PK45) and in the peri-urban area of Brazzaville.

The Government was keen to replicate the results through public funds, in order to create mass employment for women and the young, thus reducing poverty and achieving post-conflict economic reintegration. An NPFS was formulated with a total budget of over CFAF 42 213 billion (around USD 100 million), approximately CFAF 12 billion (USD 7 million) of which was earmarked for subprogrammes 3 and 4 with the objective of setting up 26 270 village breeding units comprising all species (hens, small ruminants, pigs, guinea fowl, ducks and pigeons). In February 2010, the programme was in the start-up phase.

In April 2008, the Government of the Congo requested the preparation of a programme valued at around CFAF 8 billion (USD 19 million). In addition to recovering livestock, the programme would provide support for:

- 2 100 beneficiary households (4 620 breeding cattle);
- 100 young beneficiaries (320 breeding milk cattle);
- 7 000 beneficiary households (23 334 breeding goats);
- 100 000 local hens and 20 000 improved roosters;
- 1 000 beneficiary households (guinea fowl and layer hens).

A total of 35 200 beneficiary households were directly concerned, corresponding to approximately 179 000 people, or 20 percent of the poorer segment of the rural population of the Congo. This programme is currently being implemented.

BOX 4. TCP/PRC/2904

Results

- All the units set up since 2004 in the peri-urban sites of Brazzaville are still operational.
- Sheep and goat populations have notably increased.
- Guinea fowl are well adapted (despite the weakness of the technical support services) — good results (in both Ingè and Brazzaville) were observed during all the supervision missions, with an adult mortality rate of just 5.7 percent.

Conclusions

The good results are due to the fact that the approach was scrupulously respected. The breeding units are models of success for disseminating improved methods of traditional breeding. Ingè, close to Brazzaville and easily accessible, is a classic example of a recommended peri-urban site in the SPFS diversification component.

2.4 GABON

Gabon adhered to the SPFS in 2000. In March 2005, during a visit from FAO's Director-General, the Government decided to accelerate project execution. In July 2005, an 18-month project (UTF/GAB/010/GAB) was started with financial resources totalling USD 4 424 157 from an FAO fiduciary fund. Approximately USD 200 000 were used to finance the diversification component. The first phase (18 months) began in May 2007, with Gabonese financing and support from China through South-South Cooperation.

The diversification of animal production was a priority in the Strategic Growth and Poverty Reduction Document (DSCR). It can contribute to food security and constitutes an important pillar of Gabon's breeding sector action plan. It is within this framework that an operational plan specific to the diversification component was then developed to implement a number of pilot units. From a total of CFAF 182 747 092, breeding was allocated CFAF 47 790 500 (USD 113 000).

Establishment of the breeding units was a priority in the suburbs of nine provincial capitals; technical training was provided by the Ministry of Agriculture, Livestock and Rural Development, and the provincial coordination of the SPFS. The implementation sites were as follows:

- Asseng and Ntoun (Estuaire)
- Bongoville, Franceville and Okoumbi (Haut-Ogooué)
- Isaac and Atongowanga (Moyen-Ogooué)
- Mouila and Bilengui (Ngounié)
- Tchibanga and Malounga (Nyanga)
- Makokou and Epassengué (Ogooué-Ivindo)
- Koulamoutou and Lemengué (Ogooué-Lolo)
- Port-Gentil (Ogooué-Maritime)
- Oyem and Nkolemessasse (Woleu-Ntem)

BOX 5. UTF/GAB/010/GAB and TCP/GAB/3101

Objectives

A model farm was planned in the Gabonese savannah, using 6 ha of natural pastureland: 4 ha to be used for for bovine breeding (5 cows, 1 bull); goats or pigs to benefit from the crop residues (maize stover for the goats, and tuber peels and food leftovers for the pigs); poultry to be fed with an animal feed comprising equal proportions of maize and pre-mix.

The technical economic studies of the different production sectors pointed to an operational strategy based on small agropastoral farms grouped in production centres to capitalize on important available natural resources.

Conclusions

The NPFS should capitalize on the results obtained in the pilot phase of the SPFS. For the extension of the breeding programme, it was proposed to adopt and implement a "partnership" approach, preparing detailed specification requirements and an agreement protocol between the Ministry of Agricultural and Rural Development, the various producer associations (poultry, pigs, cattle etc.) and the other actors concerned, establishing how to organize the various kinds of animal production.

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2.5 TOGO

From 1980 to 1997, Togo implemented a National Programme for Small Livestock Development (PNPE). Interesting technical results were obtained with respect to:

- sheep and goat selection at the Technical Support Centre of Kolokopé (CAT-K);
- improved goat husbandry practices (grazing, health, habitat etc.);
- supplementary fodder crop plots at CAT-K and processing and fodder conservation;

- diversification of small breeding (guinea fowl, ducks, hens, small ruminants, pigeons, turkeys, aulacodes); and

- strengthening of self-promotion in rural communities.

However, extension of the technical results to farmers was insufficient and so the PNPE did not achieve sustainability. The national authorities therefore seized the opportunity offered by SPFS to consolidate the results.

BOX 6. TCP/TOG/2902

Results

In general, the SPFS diversification component in Togo established 154 pilot small livestock units in 87 villages throughout the country. The project trained 87 veterinary and breeding auxiliaries (AVEs) to promote veterinary community care and to strengthen the early warning network. The AVEs maintain close relationships with the private veterinary services of their area, with good results at socio-economic and zootechnical level.

Socio-economic: The concept of rotating loans managed within the producer associations was well received by rural communities – they perceived this innovation as recognition of their maturity and their sense of responsibility. There was increased awareness among the targeted populations and solidarity in the form of aid and assistance from other members of the associations to the initial beneficiaries. The rural credit and savings system was strengthened and continues as a result of the commitment made to the associations and to their members to open accounts in the micro-finance institutions (MFIs).

Zootechnical: There were positive changes in animal lodging and livestock breeding. The adoption of project habitat models (poultry house, sheep pen, pigpen etc.) meant that livestock populations were enclosed more effectively, putting an end to the almost free roaming of the past. The models were easily adopted – even the pigpens that represent a radical break away from the traditional fence. The pigpen is a key element in the fight against African swine flu, as animals can be confined to avoid circulation of the virus. The adoption of these types of lodging by rural people outside the project area is evidence of the positive effects of the project on traditional livestock breeding.



Togo thus benefited from a support project (TCP/TOG/2902 [D]) for small-scale farming, from May 2003 to April 2005.

The project partners were as follows:

- *ICAT (Technical Advice and Support Institute) for zootechnical monitoring and cooperative formation.*
- *VSF (Veterinarians Without Borders) for training rural populations and village breeding auxiliaries.*
- *GVPR (Groupement des Vétérinaires Privés en Clientèle Rurale) for zoosanitary monitoring.*
- *AGIDE (Association for Integrated and Sustainable Environmental Management) for the supervision of rural farmers practising oyster mushroom cultivation (edible mushrooms highly valued on the local market).*

Problems

Semi-confinement highlighted problems related to the feeding of animals, in particular young poultry. The sudden large increase in the price of cereals (such as maize) and soya destabilized most poultry farmers and led to the distribution of imbalanced food rations to chicks; the subsequent food stress contributed to the high mortality rate observed in some pilot units.

Conclusions

The productivity goals in aviculture were not reached due to feeding problems, the inability of many rural people to manage large populations of young animals and the high mortality from Newcastle Disease. On the other hand, with sheep and goats, a good population increase was observed and some livestock farmers even started to sell some animals. Sheep fattening produced the best results and was lucrative, especially in the Maritime Region where loan repayment has begun.

In general, the diversification component of the SPFS was very satisfactorily implemented, in particular with regard to the advisory services and health monitoring of the available units of the private veterinary services and their networks of village auxiliaries.

LESSONS LEARNED ON DIVERSIFICATION (LIVESTOCK) EXPERIENCES IN THE SPECIAL PROGRAMMES FOR FOOD SECURITY IN SUB-SAHARAN AFRICA

2.6 SENEGAL

The pilot phase, which began in January 1995, saw the beginning of the collaboration between the SPFS in Senegal and two rural organizations: in the Podor area (UJAK – Young Farmers' Union, Koyli-Wirndé) and in the Zinginchor area (CADEF – Action Committee for the Development of Fogy). A project in support of small-scale rural projects adapted to the area – GCP/SEN/049/IIA – was developed and financed by the World Bank and Italy, with a total budget of USDD 1 484 000 over 3 years.

A separate diversification component – TCP/SEN/065 – was introduced in 1998. Activities concerned veterinary assistance (vaccination and disinfestation) and improvement of the habitat. In the case of poultry, the focus was also on improved poultry houses, processing and manufacturing of feed from locally available resources and genetic improvement through the introduction of breeding roosters.

BOX 7. TCP/SEN/065 GCP/SEN/049/ITA and TCP/SEN/065

Objectives

The recommendations formulated at the end of GCP/SEN/049/IIA stressed the need to accelerate the implementation of the diversification component. Indeed, the weakness in the process adopted to set up the diversification activities of the SPFS in Senegal – revealed by the follow-up mission (Laribe) – argued for the formulation of a different approach (similar to that carried out in the Niger, Chad, Burkina Faso, Mali and Cameroon):

- Find sustainable solutions to problems of malnutrition and low income in rural families.
- Develop the partnership between rural organizations, technical services and private initiatives in order to ensure the sustainability of activities.

Senegal aimed to increase animal production by making total investments of approximately USD 850 million. Roughly 15–20 percent of these resources were mobilized locally with the participation of the communities concerned, economic operators and state operators (on the basis of the commitments made during the African Union Summit, Maputo, July 2003); the remainder would be requested from the international community. The objective was to develop microprojects to create mass youth employment.

Results

There was synergy between the SPFS and TCP/SEN/065, as Senegal has the technical expertise to produce thermostable vaccines to prevent and control Newcastle Disease. The Hann laboratory produced poultry vaccines adapted to village conditions and trained vaccinators. These vaccinations are an indispensable condition for the success of the aviculture units with local hens.

2.7 BURKINA FASO

The SPFS was launched in Burkina Faso in 1994 in the west of the country, where there is good hydrological and socio-economic potential. There were several sources of funding: Belgium financed a 3-year pilot phase; UNDP provided financing to conduct an inventory of valley bottoms suitable for conversion; and Libya financed project GCP/BKF/042/LIB, implemented in 26 villages.

Diversification activities began in Sidéradougou in 1998: two projects (TFD/97/BKF/008 and TFD/97/BKF/005) each received USD 10 000 from Telefood; other contributions later financed microprojects for women's groups at several other sites.

The FAO regional policy officer in charge of monitoring livestock activities made a technical supervision visit in December 2000. It was observed that the traditional approach yielded a low income and the beneficiaries failed to take responsibility. It was therefore deemed necessary to design an approach to implement the diversification component.

A new project, TCP/BKF/2903 (D), "Support to the implementation of the diversification component", was approved by FAO in January 2003, with a budget of USD 383 853, to test a new microproject approach through livestock units. Several other countries in West and Central Africa have benefited from similar TCP (Technical Cooperation Programme) projects aimed at strengthening the diversification component: Mali, Chad, Niger, Nigeria, Togo, Cameroon, Congo, Gabon, Guinea-Bissau, Burundi, Central African Republic and Senegal.

Thirteen medium-sized towns were selected to test the new approach: Dori, Djibo, Dédougou, Diébougou, Gaoua, Léo, Sapouy, Fada N'Gourma, Manga, Orodara, N'Dorolla, Kaya and Ziniaré. A total of 42 sites were selected to host the demonstration units.

BOX 8. TCP/BKF/2903

Results

The project enabled the establishment in 2003 of 267 units; in 2007, i.e. 4 years later, 206 units were still operational – a survival rate of 77.17 percent.* The 61 non-functional units accounted for 22.84%; the highest number of non-functional units were in the centre-south (57.15%), east (50%), centre-north (50%) and north (42.85%). In the southwest, Cascades, High Basins and centre, on the other hand, the drop-out rate was 20–29%, while in three regions (centre-east, Boucle du Mouhoun and centre-west) it was just 5–10%. Finally, in the Sahel region, all the units were still functional at the time of the mission's visit in August 2007.

There were achievements at various levels:

- strengthening of the technical capacities of beneficiaries;
- strengthening of the support structures for carrying out extension activities;
- extension of the habitat models;
- creation of a system for developing new services;
- improvement of producers' income;
- contribution to promoting savings and loan institutions;

*source: FAO, 2009.



LESSONS LEARNED ON DIVERSIFICATION (LIVESTOCK) EXPERIENCES IN THE SPECIAL PROGRAMMES FOR FOOD SECURITY IN SUB-SAHARAN AFRICA

BOX 8. TCP/BKF/2903

- improvement of the food situation;
- contribution to strengthening group cohesion and preserving a good social climate in villages that benefited from the units; and
- strengthening of the compost ditch operation.

Problems

The loan repayment rate was poor; however, the recommendations made for improving it gave positive results.

Conclusions

In general, the project was beneficial to the various actors. The microproject approach was adopted by several technical and financial partners (TFPs), including:

- Decentralized and Participatory Rural Development Bazèga Kadiogo (PDRDP/BK) in the centre-south;
- Food Security via Reclamation of Impoverished Territories (PSA/RTD) and the Red Cross in the Soum;
- Support to Rural Micro-enterprises (PAMER) in the Cascades;
- BKF/007 Forest Management in Dindéresso and Kou (PAFDK) in the High Basins; and
- GCP/BKF/042/LIB financed by Libya for CFAF 2 billion.

The NPFS – a platform for collecting funds for conducting the various components → while formulated, is not yet operational. The Government is currently developing the Sectoral Programme for Productive Rural Development (PROSDRp) to integrate projects in the fields of agriculture, breeding and the environment.

2.8 CAMEROON

In March 2003, FAO approved TCP/CMR/2903 with a total budget of USD 291 000, to provide support for the implementation of the diversification component. The project:

- established 95 production units (79 of which small breeding microprojects – aviculture, small ruminants, aulacodes), 15 fish pools (3 of which carp ponds) and 1 village dairy factory;
- trained 28 rural people (selected among the beneficiaries) as breeding auxiliaries to ensure community supervision in the different project sites;

- benefited a total of 36 rural groups on 15 sites; and
- strengthened the capacities of 114 small-scale rural farmers.

Of the active beneficiaries, 60 percent are women.

A decline in egg-laying was observed among all the beneficiaries supplied by the same retailer. Indeed, some private feed suppliers sold unreliable food compositions. Another feed formula was therefore prepared by the breeders themselves on the basis of advice from the technical supervisors.

BOX 9. TCP/CMR/2903

Results

The economic results of the breeding units were relatively satisfying. Almost all of the units were still operational in 2009, generating considerable income. The women of the dairy cooperative at Sabga produce good quality yogurt and cheese, and have acquired numerous faithful customers.

The pedagogical method adopted to train the beneficiaries was successful, considering the technical and economic results obtained. Groups of farmers from the same village or with the same kind of farm came to spend a day with the most successful breeder. There was then a visit to the site of the least successful breeder. The farmers could therefore learn by observing the differences with their own eyes.

There was a very positive reaction to the breeding activities in the village communities selected for the projects. As a result, several small production units were created in addition to those already set up by the project. For example, in the fishpond site of Baïgon, a further 7 fish ponds and 5 permanent broiler chicken breeding units with an average capacity of 200 chickens each were set up. Likewise in Bandjoun, several members of the group followed the example of the first beneficiaries and created their pig breeding farms following the microproject approach.

Problems

The technical service units were identified as the weakest link in the mechanism and provisions are needed to make them more operational. Complementary technical training must be provided to help them master the medical protocol and disseminate a complete technical package including feeding, reproduction, medicines and other inputs.

The support was insufficient for beneficiaries to become self-financing:

- infrastructures were inadequate and/or there were problems in increasing the infrastructure;
- problems occurred in the acquisition of inputs (despite the emphasis placed on this component); and
- beneficiaries requested more training.

Conclusions

Almost all the breeders surveyed (48 out of 49) affirmed that the project made an important change in their lives, with an average monthly income increase of CFAF 8 000; the one breeder who experienced a significant loss later completely recovered his animal population.

The expectations of beneficiaries were generally met and in the light of the satisfying results of the pilot phase, the Cameroonian Government offered to develop and implement an extension phase with 10 200 microprojects: 2 000 units of local hens; 1 200 broiler chicken units; 1 200 layer hen units; 1 200 small units of sheep and goat breeding; 1 200 feeding units of suckler-fattening small ruminant herds; 200 feeding stalls; 1 000 aulacode units; 1 000 small pig breeding units; 500 rabbit units; 250 milk cow units; 100 apiculture units; 100 mini-dairies; 150 small processing units of poultry, rabbit and pigs; and 100 input shops.

A total of CFAF 6 391 128 000 (approximately USD 15 million) was planned for this programme over 8 years (2008–15) from national and external resources.

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2.9 MALI

The first operational phase of the SPFS in Mali (GCSP/MLI/022/NET) started in May 1998 with financing from the Netherlands (USD 2 019 711) and was completed in May 2002. The various projects focused on the intensification of strategic cereal production systems of

rice and maize in seven village sites of three cercles of the Mopti, Koulikoro and Kayes regions. Following an analysis of the local agricultural production, the projects expanded in the same areas to other activities, notably diversification to increase food security.

BOX 10. GCSP/MLI/022/NET, GCP/MLI/024/LIB, TCP/MLI/2901 and UTF/UEMOA/001/UEM

Results

Project activities mainly involved aviculture and small ruminant breeding, both practised in the traditional way in all the villages of Mali. Some farmers became professionals over time, earning their livelihoods from these two enterprises. A total of 210 units were set up in Mali.

Most of the breeding units set up with small ruminants are operational to date. Some villages, such as Sikasso and Koulikoro, currently export almost 12 000 poultry (chickens and guinea fowl) per week to Côte d'Ivoire. The peri-urban producers can barely meet the constantly growing demand for eggs from the large cities.

Problems

Technical evaluation missions assessed the functionality of the breeding units that had been operating for over a year and identified the problems and difficulties encountered:

- weakness of the service providers (agents);
- problems of hen production (brooding and survival after hatching); and
- Newcastle Disease, small pox, and parasite and tick invasions.

Conclusions

Improving breeding practices and generating income for the poor populations (especially women and youth) are innovations requiring strong support. The people's commitment is total and the various projects all apply the same microproject strategy.

Overall, small ruminant breeding received a positive assessment: loan repayment in kind began rapidly, sometimes as early as 2005. Identified weaknesses related to village aviculture were due to disease and lack of financial resources for healthcare, feed and mineral supplements. One respondent cited by the independent evaluation mission commented:

In the past, the prevailing mentality in Niantanso was that guinea fowl brought bad luck because it led to poverty. With the SPFS, we realized that isn't true. Many people today are guinea fowl breeders in Niantanso, and there are many who began their activities with eggs that I gave them. Now we know that guinea fowl brings good luck. Personally, I'm going to sell my guinea fowls as far away as Kayes and the droppings even serve as fertilizer for my market garden plots.

Source: FAO (2009).

The actions undertaken in the diversification component did not achieve the expected results and organizational shortcomings were observed. There was therefore a review of the strategy and it was decided to promote the poultry and small breeding sectors in order to encourage self-employment and to effectively combat poverty and food insecurity.

Through the TCP/MLI/2901 project and with the support of WAEMU (West African Economic and Monetary Union – which financed UTF/UEMOA/001/UEM) to the NPFS in Mali, a significant programme of diversification activities was implemented by the SPFS; it started in 2002, with USD 384 000 from TCP and USD 225 000 from WAEMU, and 232 breeding units were implemented.

With supplementary financing from FAO (SPFS/MLI/6701) of USD 430 164, and a Malian counterpart of USD 113 760, it was possible to finance technical assistance from a Chinese team within South-South Cooperation for a period of 2 years.

Through FAO, Libya contributed USD 2.0 million to implement the GCP/MLI/024/LIB project. Other financing was also mobilized, including GCP/MLI/049/SPA (USD 2.34 million from Spain), GCP/MLI/050/VEN (USD 2.0 million from the Bolivarian Republic of Venezuela), plus USD 2.0 million from Italy. Discussions are in process to relaunch South-South Cooperation.

2.10 NIGER

Project activities began in July 1995, and currently cover 28 sites in five départements, as well as the urban community of Niamey. A financial contribution of USD 141 000 from UNDP in 1999 made the formulation of the diversification component (breeding) possible.

South-South Cooperation with Morocco, within the SPFS framework, was formulated in July 1997 and approved in July 1998. The Principality of Monaco approved a sum of

TABLE 6. Main donors of the SPFS in Niger

DONORS	PROJECT	AMOUNT	YEAR
FAO (SPFS)	All components and South-South Cooperation	US\$1.3 million	1995–2004
Japan	Water control	US\$450 000	1997–1999
Telefood (FAO)	Diversification and agricultural intensification	US\$50 000	1998–2001
UNDP	Diversification	US\$202 000	1999–2003
Morocco	Technical assistance	Not available	
Switzerland	South-South Cooperation	US\$56 000	2001–2002
WAEMU	Irrigation and diversification	US\$225 000	2001–2004
IDB (Inter-American Development Bank)	Loan	US\$1.9 million	2003–2005
Monaco	South-South Cooperation	US\$276 000	2001–2005
FAO	Regular programme	US\$90 000	2004
Libya	All components	US\$1.7 million	2004–2006
BADEA (Arab Bank for the Economic Development of Africa)	Grant	US\$300 000	
Monaco II	Grant	CFAF90 000 000	
BADEA	Grant	US\$12.3 million	

Source: SPFS Niger.

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BOX 11. GCP/NER/044/ITA, GCP/NER/040/LIB and CAP

GCP/NER/044/ITA, "Promotion of decentralized cooperation in the Niger in the field of animal products and livestock industries", is financed by the Italian Cooperation. Within the SPFS, the project began in 2006, and beneficiaries were selected for guinea fowl units. The pilot phase lasted from 2006 to 2008, followed by an extension phase (2009–10).

The starter units were divided among 17 communes of the Tillabery, Dosso and Tahoua regions. Approximately 60 percent of the beneficiaries were young people; around 40 percent of the units were run by women. More than 90 percent of the units established in 2006–08 were still operational in 2009, generating income and allowing the beneficiaries to feed their families, meet sociocultural obligations (baptisms, Tabaski, marriage), satisfy other economic needs and start loan repayment. However, repayments were very low; incomes could have been higher if the beneficiaries had efficiently applied the innovations proposed for better management. Finally, the leather and skin processing and marketing units recorded profits of, respectively, CFAF 54 267 and CFAF 47 850 per month, vastly exceeding the SMIG.

GCP/NER/040/LIB, "Special Programme for Food Security in the Niger, Phase I". Sheep/goat breeding was successful, with an overall growth in the size of the individual breeding units observed during field visits and by different evaluation missions. By reducing herd sizes, group members could more rapidly benefit from the reimbursed animals and have more capital. Sheep fattening requires that young sheep are purchased to be fattened for 3 months for the Tabaski feast. An income study revealed sheep fattening to be a profitable activity, well controlled by the population, and an important source of income, in particular for women. Nonetheless, the average loan recovery rate was only 30 percent. Women tend to be better than men at repayment. The success of the aviculture component was hindered by diseases, such as Newcastle Disease, as well as fear of avian flu. The new breed of guinea fowl – Galor – introduced by SPFS, resulted in fewer health problems.

CAP. The SPFS microproject approach is used by CAP in 54 rural and urban communes and 178 community organizations (clusters of villages) nationwide; it reached 5 449 798 inhabitants in 2006, i.e. 44 percent of the population.

With respect to financial cost-effectiveness, income-generating activities provided communities with an operating capital of approximately CFAF 1 841 478 158, of which: CFAF 500 107 517 in the region of Agadez; CFAF 303 057 554 in Tahoua; CFAF 230 739 400 in Dosso; and CFAF 210 103 145 in Tillabéri. The 2007 assessment revealed that:

- 42% of households had good economic and financial profitability;
- 18% of households were fairly profitable;
- 40% of households showed a loss;
- 41% of the microproject types provided enormous social advantages;
- 19% of the microprojects strongly contributed to restoring the environment and generated substantial income; and
- all activities managed by women were profitable, where the necessary conditions were met by the cluster and the project at the origin of investment.

approximately USD 273 000 to finance the intensification and diversification activities.

In July 2000, the Islamic Development Bank formulated a support project to the SPFS with a total budget of USD 5.5 million. The contribution of the bank to the total cost of the project was USD 2.9 million, to finance part of the government contribution. Switzerland also contributed USD 56 000 to finance South-South Cooperation with Morocco.

Libya provided further funding, and to the list of SPFS beneficiaries were added the départements of Boboye, Gaya and Say, urban communes I and II of Niamey and the rural commune of Balleyara. Table 6 lists the financial support provided for the SPFS projects in the Niger from 1995 to the present.

The SPFS provided funds in 88 villages in Agadez, Boboye, Guidan Roumdji, Gaya, Guidan Roumdji, Matameye, Mirriah, Say, Tillaberyn and Téra areas and communes I, II and III of Niamey, allowing 287 beneficiaries to set up 32 sheep units (i.e. 288 ewes and 96 breeding rams or sires), 14 goat units (126 nanny-goats and 42 billy-goats) and 136 chicken units (6 800 chickens).

The microproject approach was adopted by several other projects, including: GCP/NER/044/ITA and GCP/NER/040/LIB, and the Community Action Programme (CAP), financed (for a total of USD 43.8 million) by the International Development Association (IDA), the Global Environmental Facility (GEF) and through a state and beneficiary contribution. Two additional funds were added to this initial amount: a Japan Policy and Human Resources Development Fund (PHRD) grant of USD 696 600 for sustained plantation operations of Acacia senegal, linked to the biocarbon initiative that began in 2005, and a donation of approximately USD 4 million to finance the component of the project fighting avian flu

2.11 CHAD

In Chad, the SPFS was formulated in December 1998 with the financial contribution of UNDP, the technical assistance of FAO and the participation of the national team; it became operational in 1999. Until the end of 2002, the country benefited from two FAO funding

sources within the framework of the TCP: "water control" and "diversification" projects. The TCP/CHD/0065 project, "Support to the implementation of the diversification component of the Special Programme for Food Security", had a budget of USD 105 000; it began in November 2000 and ended in November 2002.

In July 2003, given the very satisfying results obtained with the microproject approach, UNDP decided to finance the CHD/02/010 project with an initial budget of USD 368 660. The amount was later increased to USD 789 059 to extend the project to the Bahai area. The aim was to carry out 108 supplementary microprojects and contribute towards emergency assistance to 1 500 vulnerable families (around 9 000 people) in the Abéché area.

Within the framework of cooperation between Libya, FAO and Chad, the Government of Libya accepted to assist Chad to ensure continued strengthening of the SPFS activities implemented during the pilot phase. As a result, the agreement for financing the project GCP/CHD/026/LIB, "Special project for food security – Phase I", with a budget of USD 1.7 million, was signed in September 2003. The diversification component within the framework of this Libyan funding contributed to the creation of 169 small breeding units (aviculture and sheep/goats) in 30 villages divided into 6 areas. Approximately 70 groups of small-scale producers were affected. The duration of the project was from November 2003 to October 2006.

In January 2007, UNDP approved CHD/06/001, "Support to poverty reduction and food security", with a budget of USD 1 365 848 over 3 years. The project aimed to capitalize on and disseminate experiences from the pilot phase conducted over the previous 3 years by the "Special pilot programme for economic reintegration in underprivileged areas" (PSP/FAO/PNUD CHD/02/010), which was itself inspired by the approach developed by FAO within the SPFS framework through the diversification component (breeding). In this new phase, efforts focus on the Mandoul and Moyen-Chari regions, as well as the peripheral areas of N'Djaména. A total of 797 units (197 breeding units, 256 market crop units and 344 marketing units) were effectively set up.

An additional amount of USD 778 391 was provided to respond to numerous requests from producer organizations

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in 2008 and 2009. The project brought financial support to 2 064 beneficiaries to implement 515 small ruminant breeding units, 10 Kouri breeding units, 512 market garden production units and 1 027 marketing units. In addition, 913 new units were implemented from the initial repayment, comprising 112 breeding units, 175 market garden production units and 626 marketing units. Overall, the project implemented 2 977 units, of which 637 were breeding units.

On the other hand, within the framework of providing support to animal production for refugees, displaced persons and their hosts affected by the Darfour and Central African Republic crises, and with financing from Sweden (OSRO/CHD/801/SWE 2008) and the UN Central Emergency Response Fund (CERF) (OSRO/CHD/705/CHA 2007), FAO assisted 250 households (750 people) and 400 households (1 200 people), respectively, and provided additional support for a total of USD126 326.

The NPFS also began its activities in Chad. The initial cost of the diversification component was CFAF 628 500 000 (USD 1.25 million)..

BOX 13. CHD/02/010

Conclusions

The UNDP Assessment Mission report of project CHD/02/010 in Chad for the extension of the SPFS in October 2005 concluded that the beneficiaries found the approach flexible and well adapted in terms of loan recovery, and a climate of trust with respect to microcredit was thus recreated. However, the rural population only adopted technical innovations in order to achieve their own objectives.

It was strongly recommended to extend the approach to all projects in Chad financed by UNDP and in other countries for all poverty reduction programmes, with the aim of rapidly creating centres of development and employment for youth, women and demobilized military persons.

BOX 12. TCP/CHD/065

Results

Fourteen months after the end of the TCP/CHD/065 project, the main conclusions were satisfying in terms of sustainability and development of the local entrepreneurial spirit. Indeed, the farmers successfully adapted (without assistance) their microprojects to local market demands.

- 60% of the units set up in the last 3 years in the peri-urban area of rural N'Djamena are still operating without project management.
- Loan repayment in kind began in 39.6% of sites; the beneficiaries have been identified and 5% have begun repayment.
- The breeding auxiliaries are continuing their activities and still assume basic care (however, while satisfactory, some of them are not doing many interventions at present).
- The local chicken units account for 28% of units which are no longer operative or that operate very poorly; beneficiaries have tended to focus on breeding guinea fowl, ducks or goats, others on collection and marketing of poultry.
- The goat, sheep, guinea fowl and duck units showed the best results.
- Around 90 beneficiaries began their microprojects in 2004 using the paybacks from the first beneficiaries.
- One beneficiary obtained CFAF 336 000 from the sale of guinea fowl eggs in 2003; several beneficiaries improved their habitats, feed and health, and today are able to pay for their children's schooling.

3. ANALYSIS OF STRENGTHS AND WEAKNESSES



3.1 MAIN STRENGTHS

3.1.1 Increasing the technical capacity of beneficiaries

The technical competence of beneficiaries is improved through training. As a result, new kinds of actors emerge capable of adopting production, management, marketing and natural environment conservation techniques, with a consequent modernization of production systems.

3.1.2 Improvement of technical structures

Breeding agents benefit from monitoring activities; they use the knowledge gained in training/extension operations to improve the structure of the breeder organizations.

3.1.3 Extension of the habitat models

Implementation of the project has made it possible to build thousands of poultry houses, pens, hog houses and aulacode cages. These habitats provide training support for a number of projects and contribute to the:

- reduction of animal theft;
- availability of organic manure; and
- improved productivity of the beneficiary farms.

3.1.4 Promotion of non-conventional species

The promotion of non-conventional species, such as aulacodes, was central to the animal breeding development strategies in several West and Central African countries. For example, in Burkina Faso, the Cascades Region is excellent for aulacode farming. One aulacode farmer

became a model of success in Burkina Faso and abroad and the relaunching of his activity with SPFS support allowed him to achieve a substantial income. He is now the "regional expert" and is consulted to ensure the training of farmers for the benefit of organizations such as the International Union for Conservation of Nature (IUCN). He also provides advisory and supply services for breeders.

3.1.5 Development of new services

Genetic improvement and advisory services were developed. There is much interest in high-performance animals (pigs and roosters of a particular breed) and initiatives were therefore launched to satisfy demand, for example, a boar rental service.

Such initiatives contribute to increasing producers' income and have brought about technical advances by diffusing improved blood plasma. In several countries, suckler-fattening breeding farms became suppliers of Large White breeders and provided advisory and fattening services on a contractual basis following a list of specifications

3.1.6 Increased income

Increased income is one of the aims of the microproject approach. Initial results reveal that the units generate income after the first year of implementation.

Precise figures are not available due to: lack of data; insufficient monitoring; and reluctance to make loan repayments destined to cover the operating costs of the subsequent beneficiary. However, from a general point of view, there is no doubt that the microprojects have contributed to increasing beneficiaries' incomes.

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3.1.7 Promotion of savings and loans

Beneficiaries maintained working relations with savings and loans banks with positive results:

- less mistrust in financial institutions;
- savings in the form of animals; and
- promotion of the saving culture among farmers at MFI level.

3.1.8 Improved food security

The production of food of animal origin (milk, meat and eggs) for consumption has contributed to increased food security at household level. Cereal production increased due to greater availability of organic manure and producers successfully cultivated maize in areas where it was not traditionally grown. The availability of manure means savings in mineral manure.

3.1.9 Strengthening of group cohesion

The project approach is conducive to solidarity among group members: they support the beneficiary while awaiting their turn. The resulting solidarity among beneficiaries encourages training and dissemination of techniques. Improved animal management contributes to reducing the potential causes of conflictual situations in villages (damage to fields, animal theft etc.). The situation is conducive to preserving peace and cohabitation in the villages.

3.2 MAIN WEAKNESSES

3.2.1 Site selection

The choice of site does not always respect the accessibility criteria. Many selected sites were far from technical services and the connecting roads were in a poor state, with negative repercussions for the technical monitoring of the units.

3.2.2 Choice of groups

The criteria for beneficiary selection are group motivation and literacy. However, in the field, objective elements for

the assessment of group motivation were not always available; or the mere prospect of benefiting from project activities was sometimes sufficient to trigger motivation. Furthermore, the low literacy rate made the literacy criteria redundant. As a result, groups were not always well chosen due to:

- inadequate functioning and lack of community services;
- insufficient specialization with numerous different objectives pursued (agriculture, breeding, forestry, fisheries, small business, cereal banks); and
- the excessive size of the groups – an average of 20–30 members (sometimes 50–60).

In some countries, selection was based on considerations lacking objectivity or which did not take into account the experience and commitment of the promoter in the enterprise concerned. For example:

- due to lack of consensus, beneficiaries were selected by drawing lots;
- producers were selected on the basis of seniority;
- group leaders (president, general secretary, treasurer) granted themselves units without the support of the base; and
- influential people (traditional or religious authorities) or their relatives were given units.

3.2.3 Community selection of beneficiaries

Beneficiaries are not always strongly motivated and may be resistant to technical progress. However, the choice of beneficiaries is crucial to the success of operations relying on technical progress to yield the expected benefits. There is a tendency to allow the village community to select the beneficiaries; while a good thing in principle, community managers should be involved to avoid inappropriate choices. Someone with long experience in aviculture will certainly be more successful than someone selected by the chief on the basis of nepotism.

3.2.4 Animal population growth

Animal populations did not grow at the desired rate for a number of reasons:

- inadequate technical training in the raising of young animals;
- lack of technical qualifications in management at a practical level; and
- insufficient monitoring activities.

To achieve an acceptable income and sustainability, a good growth rate of the animal population is essential to:

- compensate for any mortalities;
- sell the animals to acquire inputs, vaccines and other medicines; and
- achieve the estimated net income.

Ideally, the promoter should be an expert in raising young animals.

3.2.5 Loan repayment

If the monitoring system of the implemented activities is not effective and if the beneficiaries do not repay loans, operations cease, the desired domino effect is compromised, and the group can no longer seek loans from financial institutions to continue operations without the backing of a supporting project.

3.2.6 Comprehension of the contract

Producers generally understood that the aid received had to be paid back, but they claimed that the information concerning repayment was insufficient. It is essential to thoroughly explain the clauses of the partnership contract. All microprojects are subject to financing agreements, but depending on

the administrative authority (particularly the prefect), different conventions are approved and signed. The result is that an activity may be well carried out in form, but in substance there is insufficient involvement of the decentralized technical services in fund management. This is a direct result of making beneficiaries responsible for managing the funds received for project activities.

3.2.7 Beneficiary training

In terms of concrete achievements, all the training planned was carried out. However, the following inadequacies were highlighted:

- insufficient duration;
- content too academic;
- not all trainers able to communicate effectively at farmer level; and
- fact sheets too complex (furthermore, written in French and therefore of no use to most beneficiaries).

This partly explains the confusion observed in applying certain technical issues (particularly feeding and health) and the presence of buildings which do not respect technical specifications.

3.2.8 Medicine and vaccine supplies

Rural populations experienced difficulty acquiring medicine and vaccines to treat their animals. The distributors of these products (veterinary pharmacies) usually have agencies or agents in capital cities of départements or even in smaller towns; however, they are still far from the project units. Moreover, the range of products available in these local structures is not always adequate to cure the pathologies in the small breeding farms supported by the project. Producers are obliged to travel long distances for individual supplies. The development of service units could solve this problem by finding a common solution for groups of beneficiaries and hence reducing costs.

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3.2.9 Group dynamics

The technical protocol (chicken and guinea fowl) developed in the Niger and Mali was not always applied. It is necessary to develop group dynamics.

3.2.10 Animal feeding

Breeders did not always manage to feed all the livestock in their unit, as the income generated was not equivalent to the SMIG. Measures were therefore taken to adjust the composition of various units:

- Sheep and goats (breeding). Units are normally set up with 9 females and 1 male. However, in order to allow a group to share the main unit among 3 beneficiaries (i.e. 3 females each, for reasons of feeding capacity), it was agreed to allow 1 male per beneficiary, bringing the main unit up to 12 heads.
- Chickens. Units comprise 45 hens and 5 roosters. However, the unit can also be subdivided into two, three, four or five subunits (e.g. 9 hens plus 1 rooster for 5 beneficiaries within the same group).
- Guinea fowl. Units are composed of 36 females and 9 males, with an additional 9 local hens and 1 improved rooster. The unit can also be subdivided into up to five subunits comprising, for example, 8 females, 2 males and 2 local hens.
- Sheep and goats (fattening). The unit normally comprises 10 animals; in certain cases, it could be divided into ten subunits with 1 ram or billy-goat per beneficiary.

3.2.11 Unit functioning

- Use of funds (for animals, feed and healthcare) for other purposes (cereals, miscellaneous expenses); animal populations therefore varied between units, and healthcare and feeding were negatively affected, both qualitatively and quantitatively.

- Building of habitats without respect for location criteria and technical standards (orientation, aeration etc.), with negative consequences for the development of the activity.
- Difficulty acquiring performing animals (breeding roosters, Bali-Bali rams).
- Shortage of technical services agents, both public and private; therefore, Newcastle Disease could not be controlled, with negative consequences, in particular for the poultry units.
- Poor conditions in breeding sheds – repairs on buildings or equipment were carried out spontaneously, producers waiting for damage to worsen before intervening (an attitude which undermines the solidity of the building and increases maintenance costs).
- Poor hygiene – cleaning, disinfection and quarantine practices were all insufficient.
- Inadequate recycling of generated income – producers tended to use income to cover family expenses, rather than re-investing in the units (loan repayment and animal maintenance were thus low priority and the sustainability of the units was placed at risk).
- Limited experience sharing among beneficiaries – on the same site, beneficiaries did not consult each other nor exchange opinions about common concerns.
- Non-filling in of monitoring reports – it was not possible to collect technical and economic information concerning the operations and to gauge cost-effectiveness, as the only source of information were statements by the producers (who, while recognizing the numerous advantages and financial gain, were unable or refused to provide precise figures).
- Refusal to sell poultry and sheep – during the first 2 years, beneficiaries refused to sell the animals because they:
 - did not consider themselves full owners of the animals ("the animals belong to the project or the association"); and

BOX 14. CONTRIBUTION TO THE IMPLEMENTATION OF A STRATEGY FOR PROMOTING GUINEA FOWL BREEDING IN SAHELIAN AFRICA: CONCLUSIONS

Results from the assessment carried out in five countries – Chad, Niger, Mali, Burkina Faso and Congo – as part of the promotion of the development strategies of guinea fowl breeding in sub-Saharan Africa, showed that: of 117 units set up between 2001 and 2005, 113 were still operating as at 15 September 2005 (date of the study), i.e. 96.4 percent.

This shows that the beneficiaries operate the units using the income generated by the sale of guinea fowl eggs, not necessarily from reproduction. They buy supplementary feed, medicine and vaccines. The following conclusions may be drawn:

1. A basic rapid survey is necessary to determine the reference situation prior to the introduction of any development action.
2. The targeted groups of young people and women must be maintained when considering the importance of the growing number of former students and retirees in villages who are a potential asset for the introduction of technical progress in the villages.
3. Through field visits, it is possible to clearly determine the needs and aspirations of the young, in particular, the need for a regular monthly income of CFAF 15 000–18 000 (USD 30–37) if they are to stay in the villages.
4. The microproject approach developed as part of the diversification component of the SPFS helped respond to the concerns observed in the field. Indeed, activities initiated in 2001 are still in operation today, without any further assistance from projects or other sources. The system works because it is capable of generating resources to assume all the expenses for animal health, feed and management, i.e. the desired result to prevent the constant need for foreign aid.
5. The estimated monthly income was not obtained and the real growth rate of the animal population was relatively weak (17–20 percent) due to the high mortality rate. The beneficiaries did not become sufficiently expert in raising young animals. A medical protocol for chicks and guinea fowl was developed as well as a practical training programme to assist in rectifying the observed insufficiencies.
6. The three-level strategy was deemed relevant in each of the countries concerned. Indeed, technical progress must be introduced gradually to the target groups, each one evolving at its own pace, according to its own motivation and interest.
7. The partnership contract for the technical monitoring of units by private veterinarians, high-ranking state officials or young unemployed graduates is to be strongly encouraged to enhance technical competences and prepare for the emergence of an efficient and competitive private service.
8. The official services require support for developing new strategies, determining major directions, strengthening actors and preparing a favourable legislative and regulatory framework, with a view to helping new young actors emerge, who are motivated, dynamic and capable of mastering production, management and marketing techniques.
9. The choice of beneficiaries was crucial to the success of this approach. In this regard, the lessons learned from the large-scale test operation in 120 villages (1 240 poultry farmers) will be useful for the correction of the first approaches.

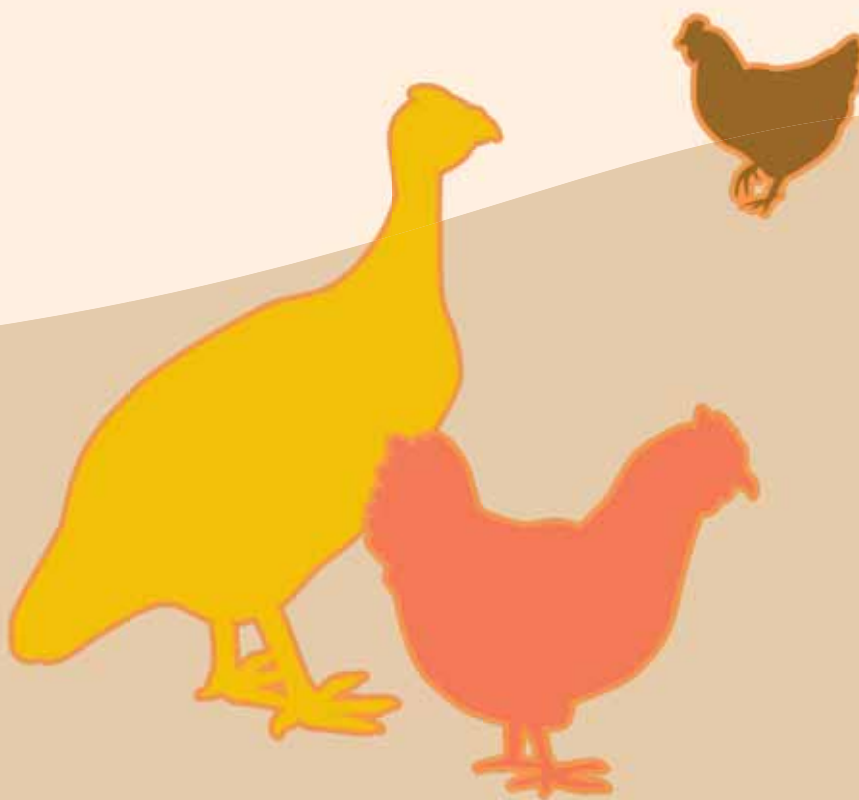
Source: Rhissa and Guernebleich, 2005.

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- were unaware that they were allowed to sell them to repay the loans without referring to technical management (they were happy looking after their stock while waiting for the day when the group or the project would come and reclaim "their animals").

Units therefore became overpopulated with subsequent problems in lodging, feeding and health monitoring, leading to a high mortality rate and extra maintenance costs.

Despite the weaknesses observed – in particular concerning the poor choice of beneficiaries by the village community – the microproject or breeding unit strategy remains a feasible approach. Almost all the new projects initiated in the different countries adopt this strategy for livestock breeding in order to contribute to the fight against poverty, food insecurity, youth unemployment and, more recently, to assist in the post-conflict reintegration of ex-combatants in countries that are gradually returning to peace.



4. LESSONS LEARNED AND RECOMMENDATIONS FOR THE FUTURE



4.1 LESSONS LEARNED

In order to sustainably achieve the desired impact of the component, it is essential to share lessons learned:

1. With limited financial means, the participation of beneficiaries and the enhancement of local potential, it is possible to trigger a sustainable self-development dynamic in the field through viable small units or microprojects at technical, economic, social and ecological level.
2. To achieve poverty reduction, small breeding in rural and peri-urban areas is a promising opportunity: it generates short-term income and allows those involved to assume responsibilities (satisfying social needs such as health and education).
3. Small processing units for breeding products make it possible to eliminate a number of marketing constraints and post-harvest losses at local level – for the benefit of small-scale farmers.
4. It is possible to create synergies with TFPs, several of which have already integrated the diversification component (breeding) of the SPFS into their poverty reduction programmes.
5. The SPFS model of the pilot breeding unit is often reproduced using producers' own means.
6. The microproject approach and integrated small farms (mixed units) are highly appreciated by the local populations. The approach is very flexible and caters to loan repayment, and a climate of trust is therefore created with respect to microcredit; it is noted that technical innovation is only adopted by rural people insofar as it allows them to achieve their own objectives.
7. Gradual introduction of technical progress at farm level is essential to ensure sustainability of the initiated actions. Nevertheless, each farm should progress at its own pace, according to four levels:
 - Level 0: family farms with extension actions, including dissemination, technical training and inputs.
 - Level 1: family farms with the introduction of technical advances and small farm management aimed at generating the equivalent of the SMIG.
 - Level 2: family farms that have introduced technical advantages and medium-sized farm management, which should yield a monthly net income of USD 100–120.
 - Levels 3 and 4: commercial and industrial farms eligible for loans from commercial banks or other institutions.

Furthermore, the following principles must be rigorously followed:

- **Beneficiary selection.** Objective criteria should be adopted on the basis of results obtained at Level 0.
- **Profitability.** Each operation or unit with an average cost of USD 400–1 000 should have sufficient financial profit to guarantee partial repayment of the financial support provided. The repayments feed the revolving fund of the groups or associations to ensure the sustainability of operations. Up to five sub-units are acceptable within a group in order to take into account the extreme poverty of some beneficiaries.
- **Gender.** At least 50 percent of projects are to be managed by women.

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- Lessons learned. It is important to capitalize on experience acquired within the previously implemented project.
- Repayment of investments. Loans granted over one or several years must be repaid either in kind (animals) or in cash, according to the cost-effectiveness of the project; social pressure should encourage repayment so that there may be multiple beneficiaries in the village.
- Village management. A village committee must supervise activities making best use of existing structures and community savings.

4.2 FUTURE OUTLOOK

Future implementation of the diversification component requires attention in several areas.

4.2.1 Modernization of production systems by integrating breeding

- Promotion of actors (or sponsors) capable of mastering production, management and marketing techniques and natural environmental conservation.
- Selection of sponsors on the basis of motivation and gradually acquired professional competence.
- Efforts to enhance existing local potential.

4.2.2 Creation of a favourable institutional environment

Attention should be paid to the following areas:

- technical support services;
- credit;
- legislative and regulatory framework;
- infrastructures; and
- training.

4.2.3 Adoption of a strategic approach

- Villages: plan the number of villages to reach per year.
- Development centres: depending on area potential and seasonal markets (e.g. Tabaski and Christmas), encourage centres specializing in:
 - milk production;
 - poultry production (guinea fowl);
 - sheep production (Bali Bali breed); and
 - goat production (red goat of Maradi).
- Technical progress: operate at different levels (0, 1, 2, 3 and 4).
- Support measures: implement measures for:
 - supply of infrastructure and equipment (small slaughterhouses, wells, fodder, water supply systems, electricity, communications, transportation);
 - provision of loans adapted to the local context;
 - – community technical support services accessible to farmers;
 - – specialized training of beneficiaries and management; and
 - – organization of beneficiaries in the market chain in order to ensure better marketing of products and proper supply of inputs.

4.2.4 Adoption of “partnership” approach

Prepare specific requirements and protocol agreements between the ministry responsible for breeding, farmers’ associations (poultry, pigs, cattle etc.) and other actors concerned, for the production of milk, meat, eggs and other animal products to satisfy the needs of all parties.

4.2.5 Direction of operational strategies

Strategies must focus on:

- self-employment;
- activities directed towards sustainability and duplication; and

- breaking definitively with the infernal cycle of poverty, chronic food insecurity and youth unemployment.
- Lessons learned in other projects, to disseminate proven strategies for the enhancement of rural areas.

4.2.6 Definition of objectives

Development objectives must be clear with specific objectives aimed at:

- strengthening the lessons learned;
- Choice of objectives (simple, precise, concrete and measurable), adopting the most efficient measures for monitoring implementation.
- improving food security through increased income; and
- Regular assessment of results in terms of increased production, productivity and income generated.
- creating rural employment through rural entrepreneurship and the emergence of new actors in the rural communities.

4.2.7 Participation

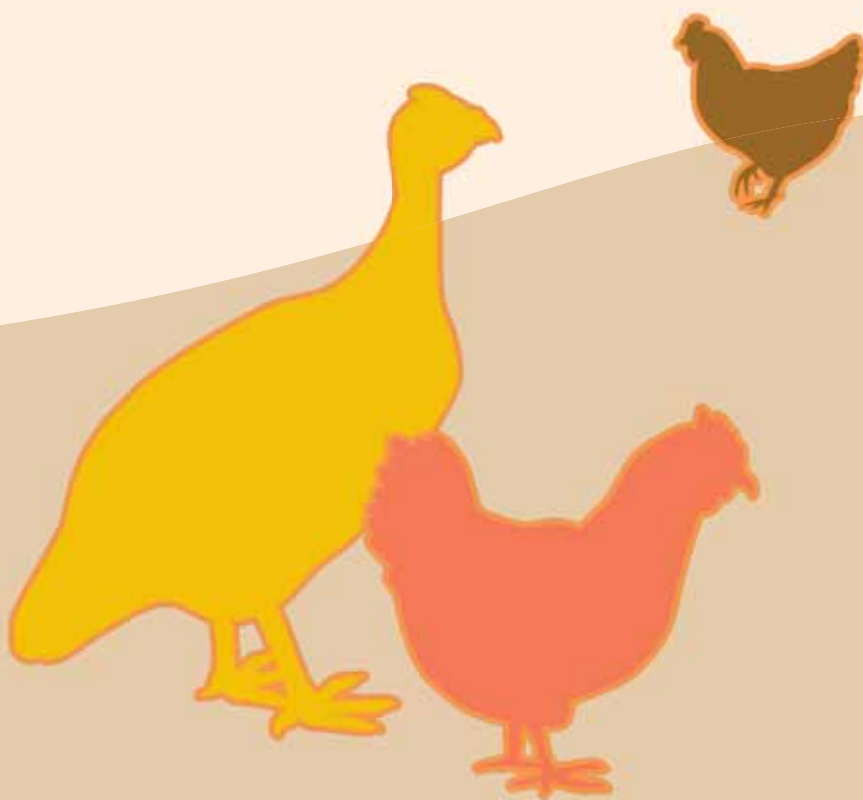
For the approach to be effective, active involvement is required from all the actors involved:

- mayors;
- heads of villages and local authorities (who will be closely involved with the preliminary identification of beneficiaries in their respective locations);
- Director General of Breeding, responsible for technical supervision;
- SPFS/NPFS coordination;
- private technical support services (veterinaries, zootechnicians) involved in setting up the service units;
- research institutes, NGOs and TFPs; and
- other special programmes.

4.2.8 Concrete actions

- Unexplored avenues and new approaches.

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5. GENERAL CONCLUSIONS



Numerous lessons have been learned after over 10 years of monitoring the implementation of the diversification component of the SPFS in the following countries: Niger, Burkina Faso, Chad, Mali, Cameroon, Togo, Central African Republic, Congo, Burundi, Guinea-Bissau, Gabon and Nigeria. The conclusions of the various evaluation missions are very positive in terms of the sustainability of the activities implemented and, above all, concerning the development of local entrepreneurial spirit.

1. The implementation strategy in each of the 11 countries under review is based on the microproject or breeding unit approach, and according to technical level. The tested breeding unit is a viable and profitable small-scale farm, not only at technical, economic, social and cultural level, but also from an ecological point of view.
2. The technical level approach is the best for selecting beneficiaries who are motivated and open to technical progress. While favouritism was observed at times with breeding units not fairly allocated by the local leaders, selection according to technical level remains the best way to allow beneficiaries to advance at their own pace, according to their capacities and motivation.
3. Innovations in habitat, feed, health and herd management (reduction of animal roaming) are designed to improve the performance of small farm breeding and increase its contribution to the fight against poverty and food insecurity. The adoption of simple breeding techniques helps small-scale farmers to intensify their production and generate income, allowing them to fight poverty and food insecurity more effectively and in a sustainable manner.
4. Analysis of the results obtained based on three criteria – sustainability of activities, increase in income and real growth rate of the animal populations – confirms

the relevance of the microproject approach. Indeed, many beneficiaries have already begun to assume all the expenses needed to operate their activity while improving productivity of their breeding farms; this is a success, since the main objective is to avoid continual reliance on foreign aid.

5. Data show that all unit types are equally efficient if the basic production techniques are properly applied. Nevertheless, it should be noted that some units are more fragile than others, and some require more care and a greater workload. For the sake of comparison, the poultry units are more fragile despite their capacity to generate daily income. This is the reason for which several beneficiaries have chosen to return to small ruminant breeding.
6. The diversification component has positive effects on household food security. Beneficiary households can improve food security thanks to increased income from the sale of their products. Furthermore, there is improved nutrition for vulnerable groups (particularly women and children), who are able to consume more protein-rich foods, such as meat, milk, eggs and legumes.
7. The various activities provide support to small-scale rural producers within their associations by improving the breeding of small livestock on family farms and providing supplementary income to improve their well-being. They are equipped to face periods of scarcity as they are able to obtain essential foodstuffs for their family, and can cover daily costs for health and school supplies.
8. The breeding units may be considered extremely successful despite the constraints related to animal health. They contribute to the development of a whole chain of important activities in the agricultural and commercial field. The units are well integrated in the family production system and make an important

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contribution to income growth. Even in the absence of local technical support, households benefit from a basic know-how, which allows them to manage the constraints related to the practice of small animal breeding.

9. Actors unanimously recognize that their small breeding units are an important element in the fight for food security and job opportunity. Some beneficiaries wisely use their animal manure for other farm cultivation, especially market garden crops and maize. This is in line with the proposal to integrate small breeding with food crops in order to optimize the yield of family farm (agropastoral) units.

10. The microproject approach is a feasible strategy when adopted correctly with respect for the basic principles, steps, practical methods, monitoring of activities and support measures. Strategies need to be developed to widely apply microprojects and achieve a considerable and sustainable impact. The approach gives good reason to be optimistic in several African countries; national authorities adopt the approach, aware that it can be the catalyst for development activities in rural areas.

11. The outlook is very reassuring, with thousands of breeding units or microprojects financed by governments, financial and technical partners (bilateral and multilateral cooperations) and financial and economic institutions (WAEMU, IDB, BADEA, BRS [Banque Régionale de Solidarité] and MC2 [Mutuelles Communautaires de Croissance]), immigrants, NGOs and the private sector. Projects include 26 272 units in the Congo, 10 300 units in Cameroon and over USD 64 million each in the Niger and Mali.

12. In general, SPFS support has made it possible to prepare beneficiaries for their new responsibilities: to become autonomous. Some small breeding farmers have mastered the technical innovations and will quickly become independent. However, others still need technical support and the benefit of management activities. Expert knowledge on technical issues by beneficiaries has also considerably improved, especially with regard to feeding, animal health, habitat and herd management.

13. The approach must now be strengthened and disseminated through policies and strategies liable to

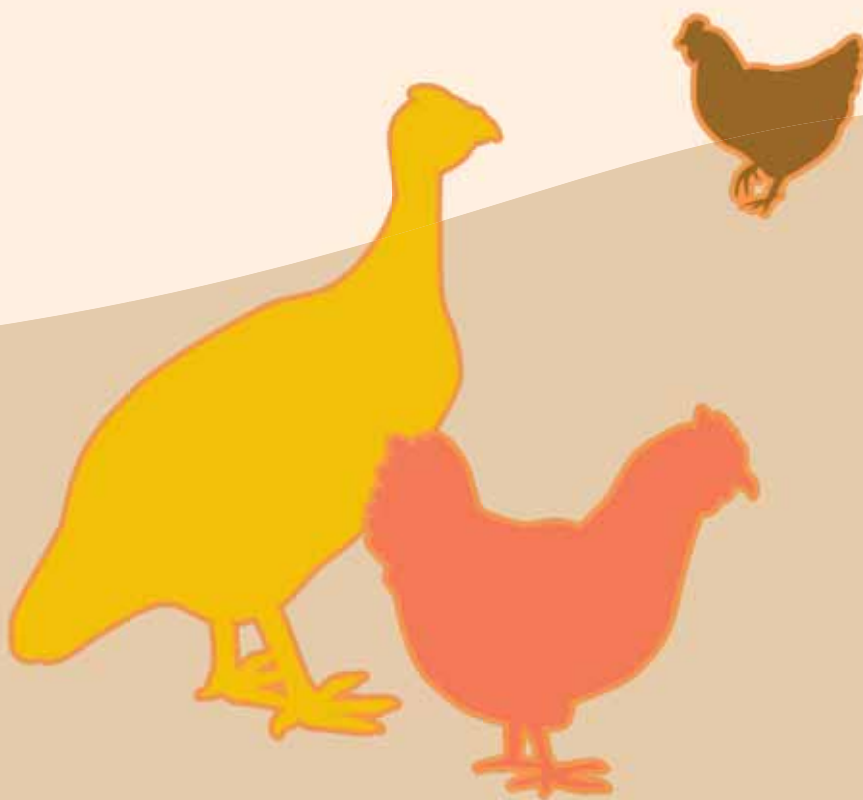
contribute to resolving the operational shortcomings in rural development actions previously shown and described in workshops, seminars and other studies during the last 50 years and more.

14. Dissemination strategies should be based on:

- the principle of cofinancing (contributions from beneficiaries and the project) and repayment within the group in order to establish an operating fund to benefit other members, thus extending the operation;
- the transfer of adapted (simple and inexpensive) technologies through direct training of beneficiaries who must be models for stimulating producers in their environment – the indirect beneficiaries (who are by far the most numerous) learn from the know-how and services of those initially selected for training, i.e. the domino effect;
- the use of advisory services (provided by the private sector) to ensure supplies and interventions in the units;
- capacity-building of actors through organization, information and communication;
- the preparation and dissemination of model projects among development partners involved in the fight against poverty and food insecurity, for integration in national programmes;
- the “partnership” approach, i.e. preparation of exact specifications and agreement protocols between the ministry in charge of breeding, the different producers’ associations (poultry, pigs, cattle etc.) and other actors concerned, in order to produce milk, meat, eggs and other animal products according to need and using the production system developed in agreement with the parties concerned; and
- the preparation at national level of fact sheets and model projects for development partners involved in poverty reduction and the fight against food insecurity, with a view to integrating this approach into their own programmes and intervention areas.

The microproject approach must allow the various sub-Saharan African countries to develop their own strategy using their own comparative advantages, in particular: knowledge of the local reality; know-how of the populations; adaptation of local breeds to the environmental ecological conditions; and the abundant natural resources. For example, raising guinea fowl and breeding ostrich or Canada goose are just some of the opportunities to be explored in sub-Saharan African in order to develop trade outside the continent. The current demand for organic produce in developed countries offers an excellent opportunity. Pilot projects must be encouraged to obtain as much information as needed for the quick expansion of production systems in order to achieve a rapid and sustainable impact.

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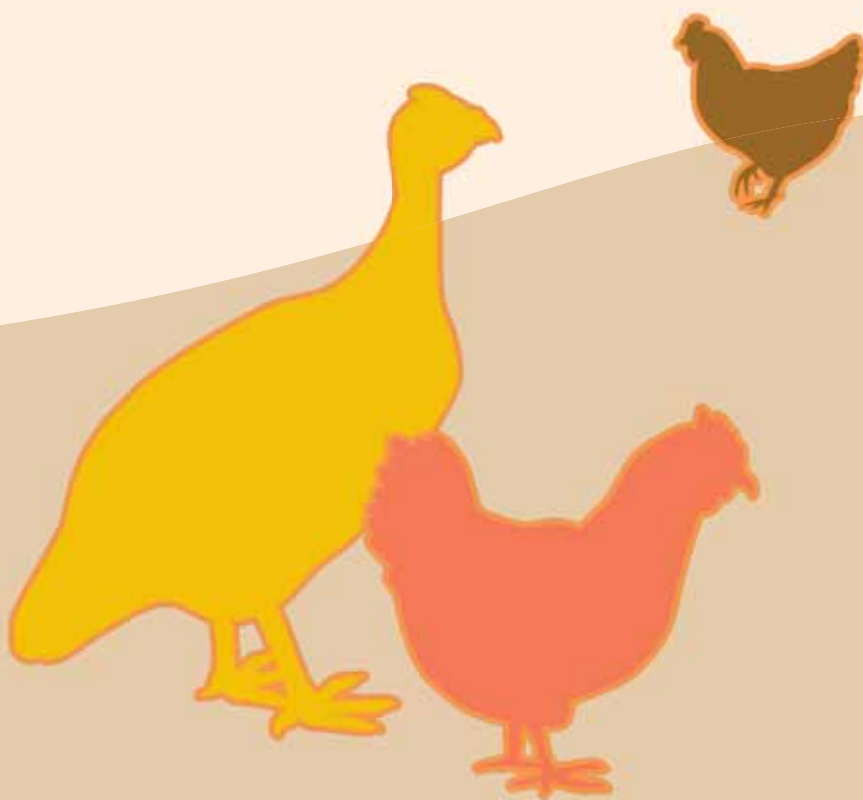
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ANNEX 1

ASSESSMENT RESULTS OF THE GUINEA FOWL UNITS ACCORDING TO CRITERIA OF SUSTAINABILITY, INCOME AND THE GROWTH RATE OF THE ANIMAL POPULATIONS

Tables 1, 2 and 3 provide the assessment results of the guinea fowl units in Chad, the Niger, Mali, Burkina Faso and the Congo according to criteria of sustainability, net income obtained and growth rate of the animal populations. The study was carried out in 2005 in preparation for the Dar es Salam Conference on Family Aviculture, 5–7 October 2005.

1. Sustainability

In the five countries, 113 of the 117 units (i.e. 96.4 percent) set up between 2001 and 2005 were still operational. This indicates that the beneficiaries operate the units with revenue from the sale of eggs and guinea fowl, not necessarily from reproduction. They buy supplementary feed, medicine and vaccines.

TABLE 1. Situation of guinea fowl units (15 September 2005)

COUNTRY/YEAR	2001	2002	2003	2004	2005	TOTAL UNITS	FUNCTIONAL UNITS	%
Chad	7	–	3	–	–	10	9	90
Niger	–	–	10	–	–	10	10	100
Mali	–	–	25	–	–	25	24	96
Burkina Faso	–	–	–	60	–	60	58	96
Congo	–	–	–	12	–	12	12	100
Total	7	–	38	72	–	117	113	96.4

2. Income

TABLE 2. Assessment according to net monthly income (CFAF)

COUNTRY	ESTIMATED INCOME/UNIT	REAL INCOME/UNIT	DIFFERENCE BETWEEN ESTIMATED INCOME AND REAL INCOME	OBSERVATIONS
Chad	19 150	15 000	- 4 150	Over 4 years
Niger	18 000	14 750	- 4 750	Over 2 years
Mali	25 000	20 500	- 4 500	Over 2 years
Burkina Faso	37 104	17 000	- 20 104	Over 1 year
Congo	25 000	20 000	- 5 000	Over 6 months
Average/unit	24 850	17 450	-7 400	

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3. Animal population growth rate

TABLE 3. Real growth rate of the animal populations

COUNTRY	STARTING STOCK/UNIT	BIRTHS/ UNIT	MORTALITIES/ UNIT	TRANSFER/ UNITS	CURRENT POPULATIONS/ UNIT	REAL GROWTH RATE (%)
Chad	55	220	105	50	65	20
Niger	45	180	160	10	55	21
Mali	60	250	103	77	80	33
Burkina Faso	45	200	90	95	60	31
Congo (6 months)	37	47	22	–	62	17

4. Main conclusions

- The microproject approach designed to respond to concerns observed in the field has proven feasible. Actions initiated in 2001 are ongoing, without further assistance from the project or from other sources. This is evidence that the system operates by assuming all animal health, feed and management costs, i.e. the desired outcome is achieved.
- The estimated monthly income was not reached and the real growth rate of the populations was low (17–20 percent) as a result of the high animal mortality rate. The beneficiaries did not succeed in the breeding of young animals. A medical protocol for hens and guinea fowl has therefore been developed, as well as a practical training programme to assist in rectifying the observed shortcomings.
- A three-level operational strategy was deemed relevant in each of the countries concerned. It is clearly necessary to introduce technical progress gradually to the targeted groups, allowing each one to evolve according to its own pace, motivation and interest.
- The partnership agreement for the technical monitoring of the units by private veterinarians, state officials or young unemployed graduates should be encouraged, in order to enhance technical competence and prepare for the beginning of an efficient and competitive private service. It is necessary to involve the official state services in the development of strategies, determining major orientations, overseeing the actors and preparing a favourable legislative and regulatory framework.
- The choice of beneficiaries is the primary condition for the success of the approach. Therefore, the lessons learned from the large-scale test operation (120 villages and 1 240 poultry farmers) will be useful for improving on the first results.

ANNEX 2

ASSESSMENT OF THE AVERAGE PRODUCTION COSTS OF POULTRY BREEDING IN GABON

The objective of the operation is to minimize the costs of modern aviculture, which are very high, particularly for feed and chicks. The aim is therefore to end the dependence on feed suppliers (which openly operate under a monopoly) by growing maize on the farm.

Depending on the type of production planned, there are several pre-mixes on the market that could facilitate the operation. Since the farms are organized in groups, the farmers must acquire a common grinder for maize before they can prepare their own mix. The cost of feed would be reduced by more than half. Furthermore, the guinea fowl can be used for eggs because they are also good layers (but poor brooders), while the chickens produce chicks to be raised for meat.

Combinations are possible between the different enterprises. For example, a farm can choose – in addition to the necessary plant production – cattle and pig breeding, or pigs combined with poultry etc.

TABLE 1. Production costs (CFAF)

ITEM	COST	PERCENTAGE
Chicken	155	26
Feed	157	26
Veterinary care	69	12
Labour	103	17
Amortization	116	19
Total cost price of chicken	600	100

TABLE 2. Finance requirements for one unit (Level 1) (CFAF)

INFRASTRUCTURE	UNIT PRICE	TOTAL COST
Building 14 m ²	13 250	185 500
Purchase of animals		
10 hens	3 500	35 000
1 rooster	10 000	10 000
16 female guinea fowl	8 000	128 000
4 male guinea fowl	8 000	32 000
Feed	45 600	45 600
Equipment	10 000	10 000
Veterinary care	20 000	20 000
Manpower	60 000	60 000
Total expenses		526 100

TABLE 3. Operating expenses (model year) (CFAF)

	FARMING PRODUCTS (A)	OPERATING EXPENSES (B)
Purchase of breeders		205 000
Feed		45 600
Veterinary care		20 000
Amortization of poultry house		61 850
Amortization of equipment		5 000
Labour		60 000
Sale of chicken meat	349 200	
Sale of 2 400 eggs	156 000	
Sale of 19 culled guinea fowls	152 000	
Sale of droppings	75 000	
	A= 732 200	B= 397 450
Result (A – B)		CFAF 334 750

NB: Equipment amortization is calculated over 2 years.

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TABLE 4. Chicken: costs (CFAF)

ITEM	UNIT COST	PERCENTAGE
Guinea fowl	10	23
Feed	15	35
Veterinary care	1	2
Labour	6	14
Amortization	11	26
Total cost price of an egg	43	100

Poultry breeding (starting from 500 broiler chickens) at Level 2 or 3

Technical and financial studies for the two enterprises (eggs and meat) were carried out with encouraging results in terms of cost-effectiveness for populations of 500 heads.

TABLE 5. Chicken: costs (CFAF)

ITEM	UNIT COST	PERCENTAGE
Chicken	645	24
Feed	1445	54
Veterinary services	269	10
Amortization	195	7
Marketing	108	4
Total cost price of chicken	2 662	100

Broiler chicken breeding in Libreville

TABLE 6. Expenses and revenue (CFAF)

EXPENSES		REVENUE
Investments	3 325 000	Sale 1 627 500 (from 465 chickens sold)
- livestock barns	3 000 000	
- supplies	325 000	
Operations	1 237 625	
Total:	389 875 CFAF per batch	

As it is possible to make four batches each year, the farm could produce annually 2 883 kg of chicken meat –CFAF 1 559 500 of average annual profit can be expected, or a monthly income of CFAF 129 958.

This type of farm therefore needs CFAF 3 325 000 of investment and CFAF 1 147 000 of operating funds, for a total of CFAF 4 472 000.

Breeding clutch (500 chicks)

TABLE 7. Production cost of an egg under semi-intensive breeding (CFAF)

ITEM	COST	PERCENTAGE
Pullet	15	19
Feed	46	58
Veterinary care	1	1
Labour	6	8
Amortizations	11	14
Cost price of an egg	79	100

ANNEX 3

ASSESSMENT OF THE AVERAGE PRODUCTION COSTS IN AVICULTURAL AND PIG BREEDING FARMS IN THE CONGO

INTRODUCTION

The current situation of the breeding subsector in the Congo (a post-conflict country) requires the development of a priority programme for livestock rehabilitation.

This would make it possible not only to lower the foreign food bill (estimated at CFAF 120 billion in 2007), but also to develop its enormous agropastoral potential for creating jobs for the more underprivileged segments of society (especially youth), thus contributing to poverty reduction.

However, in the current context of globalization, trade and liberation of tariffs, it makes no sense to produce without allowing access to markets.

In order to access markets, local animal products must enter into competition with imported products. This raises the issue of their competitiveness, which is closely linked to their cost price.

As a result, all programmes for developing sectors related to animal breeding must inevitably take into consideration this important economic precondition, without which there can be no chance for success.

While not a detailed study, this report is valuable for determining the average current production costs in short-cycle breeding in peri-urban areas, in order to serve as a decision-making support tool.

CALCULATION OF THE AVERAGE POULTRY PRODUCTION COSTS IN PERI-URBAN AREAS

TABLE 1. Broiler chicken in the semi-intensive system: costs (CFAF)

ITEM	UNIT COST	PERCENTAGE
Broiler chicken	700	26.1
Feed	1 600	59.9
Veterinary care	150	5.6
Heating	70	2.6
Labour	25	0.9
Miscellaneous expenses and losses	50	1.9
Amortizations	80	3
TOTAL	2.675	100

Calculation of items

- Feed consumption (1–45 j): 4 kg
- Consumption Index (CI): 2.1
- Live weight at the end of the breeding: 1.8–2 kg
- Carcass weight ≈1.5 kg

Calculation of sale price (CFAF)

- Average cost price of broiler chicken (live weight: 1.8–2 kg) at the farm: 2 675
- Cost price of slaughtered chicken (carcass weight 1.5 kg):
- 2 675 + 2 675 (× 5% slaughtering cost) ≈ 2 810
- Sale price of slaughtered chicken:
- 2 810 + (2 810 × 20% of trade margin): 3 372

Where $\frac{3\,372}{1.5} = \text{CFAF } 2\,248$ per kg of chicken meat.

LESSONS LEARNED ON DIVERSIFICATION (LIVESTOCK) EXPERIENCES IN THE SPECIAL PROGRAMMES FOR FOOD SECURITY IN SUB-SAHARAN AFRICA

Comments

The feed and chickens alone represent 86 percent of the total cost of production. In order to obtain a reduction in cost price of locally produced broiler chickens, priority must be given to these two inputs.

TABLE 2. Competitive analysis of the cost price of broiler chicken (CFAF)

ITEM	COUNTRY OF ORIGIN		DIFFERENCE
	REPUBLIC OF THE CONGO (CFAF)	CAMEROON (CFAF)	
Broiler chick	700	450	+250
Broiler feed	400	240	+160
Live chicken	2 675	1 885	+790

The cost price of a broiler chicken produced in the Congo is approximately 30 percent higher than that produced in Cameroon – a country whose modern aviculture sector is the most developed in the CEMAC region.

TABLE 3. Competitive analysis of the cost price of broiler chicken meat on the market, Congo (CFAF)

ITEM	COUNTRY OF ORIGIN		DIFFERENCE
	CONGO	EU	
Broiler chicken meat	2 248	1 300	+9.48

The sale price of chicken meat produced in the Congo is 40 percent higher than that of broiler chicken meat (cut pieces) imported from the EU. This explains why almost all chicken meat consumption (99.6 percent) is from imported products. In order to reduce food dependence on poultry meat in the short term, one pathway could be to develop traditional aviculture by improving the numerical and weight productivity of the animal populations by vaccinating against fatal epizootics and introducing improved roosters.

TABLE 4. Average cost price of eggs for consumption in semi-intensive system (CFAF)

ITEMS	UNIT COST	PERCENTAGE
Feed	73.34	81.3
Veterinary care	0.42	0.5
Labour	1.25	1.4
Miscellaneous expenses and losses	2.71	3
Amortization	12.5	13.8
TOTAL	90.22	100

Calculation of items

- Price of pullet at the beginning of brooding: 5 500 CFAF
- •Number of eggs per chicken: 240
- Quantity of feed consumed (20–72 weeks) per chicken: 44 kg
- Price of feed: 400 CFAF/kg.

Calculation of sale price (CFAF)

- Price of egg produced on the farm: 90.22
- Sale price of egg on farm: $90.22 + (90.22 \times 20\%)$ of commercial charge ≈ 110
- Retail sale price: 120–140

Comments

Feed and amortization (particularly of pullets) alone account for 95 percent of the total cost price of egg production. In order to obtain a reduction in cost price of eggs for consumption, priority must be given to these living expenses.

TABLE 5. Competitive analysis of the cost price per egg for consumption (CFAF)

ITEM	COUNTRY OF ORIGIN		DIFFERENCE
	CONGO	CAMEROON	
Hen clutch	850	700	+150
Clutch feed	400	220	+180
Egg for consumption	90	38	+ 52

The cost price of an egg for consumption produced in the Congo is around 2.5 times higher than that of one produced in Cameroon (the country of reference in the CEMAC subregion).

TABLE 6. Competitive analysis of the market sale price of eggs for consumption, Congo, Cameroon and EU (CFAF)

ITEM	CONGO		CAMEROON AND EU		DIFFERENCE	
	WHOLESALE	RETAIL	WHOLESALE	RETAIL	WHOLESALE	RETAIL
Egg for consumption	110	125	97.5	120	+ 12.5	+ 5

With a cost price of CFAF 38, the egg for consumption from modern aviculture in Cameroon is a very competitive product, subject to trade transactions in the subregion (it is exported to the Congo, Cameroon and Equatorial Guinea).

On the market in the Congo, notably in Brazzaville, the sale price of locally produced eggs for consumption is slightly higher than and sometimes almost the same as (depending on the period) that of imported eggs.

The egg situation on the market differs from that of poultry meat, where there is a very wide gap between local meat and imported meat.

Moreover, consumers have greater trust in local eggs, which they consider fresher and of higher quality than imported eggs, and they are therefore willing to pay an extra CFAF 5 or 10.

Indeed, the demand for locally produced fresh eggs is very high; but supply fails to meet demand, reaching only 13.3 percent.

The competitiveness of local eggs could be easily increased by tackling the main bottleneck, i.e. feed (which represents 81.3 percent of the product cost).

CALCULATING THE AVERAGE COST PRICE OF PIG PRODUCTION IN PERI-URBAN AREAS

Calculation of items

- Cost per kg of live weight of breeding piglet: CFAF 2 500
- Live weight at slaughter: 100 kg
- Carcass yield: 70%
- Consumption Index (CI): 3.5
- Cost of 1 kg of feed: CFAF 400

TABLE 7. Average cost price of 100 kg of live weight of farmyard pig (Large White) in the semi-intensive system, fed with commercial compound feed (CFAF)

ITEM	UNIT COST	PERCENTAGE
Breeding piglet (10 kg)	25 000	15.6
Feed	126 000	78.6
Veterinary care	500	0.3
Labour	3 000	1.9
Miscellaneous expenses and losses	3 500	2.2
Amortization	2 250	1.4
TOTAL	160 250	100

Calculation of sale price (CFAF)

- Cost price per kg of live weight:

$$\frac{160\,250}{100} \approx 1\,600$$
- Fees for slaughter and health inspection: 2 000/head
- Cost price of carcass (70 kg) $160\,250 + 2\,000 = 162\,250$
- Cost price per kg of pig meat:

$$\frac{162\,250}{70} = 2\,318$$

Where the sale price of 1 kg of pig meat is:
 $2.318 + (2.318 \times 20\% \text{ of trade margin}) = 2\,781.6 \approx 2\,780$.

Comments

With a wholesale price of CFAF 2 780/kg of meat, it is almost impossible to place this product on the market, because the sale price currently in force by producers varies between CFAF 1 750 and 2 000 per kg.

With respect to imported products, any comparison is impossible because they generally concern poor quality cut pieces (tail of pig, pig leg), better classed as "scraps".

LESSONS LEARNED ON DIVERSIFICATION (LIVESTOCK) EXPERIENCES IN THE SPECIAL PROGRAMMES FOR FOOD SECURITY IN SUB-SAHARAN AFRICA

The two major expense items are feed and the breeding piglet (around 94 percent of the total production cost).

TABLE 8. Average cost price of 100 kg of live weight of a farmyard pig (Large White), fed with farm-produced feed based on agri-industrial by-products (waste from cassava flour, fish, brewery and banana peel etc.) (CFAF)

ITEM	UNIT COST	PERCENTAGE
Breeding chicken (10 kg)	25 000	28.5
Feed	54 000	61.5
Veterinary care	500	0.6
Labour	3 000	3.4
Miscellaneous expenses and losses	3 000	3.4
Amortization	2 250	2.6
TOTAL	87 750	100

Calculation of items

- Price of live weight of breeding piglet: CFAF 2 500
- Live weight at slaughterhouse: 100 kg
- Carcass yield: 70%
- Consumption Index (CI): 4
- Price of feed/kg: 150 CFAF

Calculation of sale price (CFAF)

- Cost price of 1 kg of live weight

$$\frac{87\,750}{100} = \text{CFAF } 877.5$$
- Cost price of slaughtering and health inspection: 2 000/head
- Cost price of carcass (70 kg)
 $87\,750 + 2\,000 = 89\,750$
- Cost price of 1 kg of pig meat

$$\frac{87\,750}{100} = \text{CFAF } 1\,282$$
- Cost price per kg of pig meat:
 $1\,282 + (1\,282 \times 20\% \text{ of commercial margin}) = 1\,538.4 \approx 1\,540 \text{ CFAF}$

Comments

- Pig meat produced with feed based on agro-industrial by-products costs almost half that of feed produced with commercial compound feed (CFAF 1 282 against 2 318 per kg).
- The cost price (CFAF 1 282 per kg) obtained by this system allows to easily place pig meat on the local market where the sale price is around CFAF 1 750–2 000 per kg.
- In practice, the feed system consisting of agro-industrial by-products allows for very comfortable profit margins..

In this particular case, feed only represents 61.5 percent (compared to 78.6 percent with food from trade) of the total production cost.

CONCLUSION

In general, traditional poultry and pig productions strongly depend on compound feed, i.e. cereals (in particular, maize) and oilseed crops (especially soya). They are characterized by high production costs and low competitiveness on the local market.

Until the competitive capacity of these productions is achieved, it would be pertinent to promote alternative methods or processes of livestock feeding, for example, farmyard chickens fed on insects, maggots and worms, or pork fattened with agricultural or agro-industrial by-products.

In contrast, due to the relatively short production cycle and the large amounts of fodder available, breeding ruminants, especially small ruminants (sheep and goats), are a major priority in the development programme for animal livestock sectors in the planning stage, as long as particular attention is given to the control of epizootics with high mortality rates, such as goat plague.

ANNEX 4

MEDICAL TECHNICAL PROTOCOL FOR CHICKEN/GUINEA FOWL IN NIGER

The medical technical protocol below was implemented in the Niger to limit losses in breeding young chickens and guinea fowl, which have a potential annual mortality rate of 90 percent

A kit for 50 animals is composed of:

- 10 g antibiotic (Tetracolivit) CFAF 180
- 12 g coccidiostat (Amprolium) CFAF 200
- 10 g internal antiparasitic (piperazine citrate/ polyvalent vermifuge V) CFAF 260

- 4 g Vitamin (total Amin) CFAF 56
- 50 doses Newcastle disease vaccine (ITANEW) CFAF 1 400.

In addition, the protocol requires preparation of 100 g of an external antiparasitic, Carbalop (CFAF 2 300).

The cost of the kit is estimated at CFAF 180/chicken for the first full 3 critical months of young chicken and guinea fowl breeding.

TABLE 1. Medical technical protocol

AGE	TREATMENT	DURATION OF THE TREATMENT	PRODUCT SUGGESTED	FREQUENCY
Day 1–5	Antibiotic	5 days	Tetracolivit 0.5g/litre → 10 g/20 litre for 50 $\frac{1\ 800}{100} \times 10 = 180$ CFAF	In case of disease.
Day 14–20 Day 50–56 Day 86–91	Anticoccidial	5 - 7 days	Amprolium 12 g/20 litre for 50 $\frac{1\ 750}{100} \times 12 = 200$ CFAF	Each month.
Day 21 5 months 10 months	Vaccination against Newcastle disease	15 days	Subcutaneous ITANEW 0.1 - 0.2 cc, where $\frac{2\ 750}{100} = 28$ CFAF/dose 28 x 50 = 1 400 CFAF	3 months after the first treatment, then 6 months after the second, then each year.
30 days and 45 days, then every 2 months.	Fight against worms	1 day	Piperazine citrate 100 g = $\frac{1\ 300}{100} \times 20 = 260$ CFAF	15 days after the first treatment, then every 2 months.
	Vitamins	3 consecutive days	Amin total sachet 150 g = 2 115 4 g/20 litre = $\frac{2\ 115}{100} \times 4$ g = 56 CFAF	Once a month.
	External antiparasite treatment		Carbalop 100g = 2 500 1 sachet per 20 kg of ash; then treatment of the poultry house 2 - 3 times per year with a sprayer.	

ANNEX 5

EXAMPLE OF A PARTNERSHIP PROTOCOL AGREEMENT FOR PROMOTING BREEDING

1. INTRODUCTION

The Ministry of Agriculture and Rural Development (hereafter "MADR") and the Association of Poultry, Pig, Cattle, and Small Ruminants Farmersrepresented by Mr/Ms..... (hereafter "the Beneficiary Association") has agreed to promote breeding in the process of implementing the _____.

2. THE PARTIES HAVE AGREED:

A: To set up breeding units, divided as follows:

- 1.
- 2.
- 3.
- 4.
- 5.

B: To efficiently implement these units by focusing on, in particular:

- the improvement of feed;
- the improvement of lodging and hygiene;
- the improvement of health coverage;
- rigorous management of the units;
- the profitability of the units; and
- repayment of the agreed capital to the village community.

C: To define the responsibilities of each stakeholder in this Protocol Agreement as follows:

MADR is responsible for:

- the planning of the units to be set up in the various locations;
- identifying and negotiating with the financial institutions interested in investing in breeding; and

- providing technical and supervisory advice for the various operations in order to guarantee better production, repayment of the investment and sustainability of the operation.

The Beneficiary Association is responsible for:

- identifying the members of the groups capable of benefiting from the units and guaranteeing their credibility;
- organizing the members to yield good production and profitable sales of the products;
- organizing the supply of inputs;
- organizing repayment to financial institutions; and
- overseeing the management documents (monitoring sheets, management report etc.).

The Beneficiaries, listed in the attached Annex 3, are responsible for:

- building lodgings with the support of the project in the time frame required by technical support;
- preparing feed;
- wisely operating the units of production (feed, care, lodging, regulating the population flow);
- complying with the techniques used;
- record-keeping of management documents (monitoring fact sheet, management workbook);
- paying back the investment to the financial institutions; and
- actively taking part in awareness raising and training.

The different stakeholders:

General conditions

- The financial contribution provided by the financial institution under this Agreement shall be used by the beneficiary exclusively to carry out the Programme for Promoting Livestock Breeding in Gabon.

- The Association is responsible for the organization and implementation of the Programme.

Association shall not release us from our commitments with respect to the Project.

2. ACT OF JOINT GUARANTEE

We, the undersigned, members of _____ Association, are committed to an indivisible act of joint guarantee with MADR. This commitment is valid for all amounts due by our Association in principal, interest and related sums under loan agreement No. _____.

We commit ourselves to assume all costs and expenses resulting from performing these commitments, including procedural costs and fees committed for recovering the sums owed by us.

We hereby subscribe to this commitment until full repayment of this loan to the village.

We shall accept any accelerated payment on the loan if requested of the Association.

Signed on the _____ day of _____

We recognize that any modifications or the disappearance of the reports by fact or by law existing or liable to exist between ourselves and our

The President

The Treasurer

Attached herewith is a list of beneficiaries of the unit and their signatures.

ANNEX 6

ANALYSIS OF OPERATING STATEMENTS OF BREEDING UNITS IN CHAD

The results of the analysis of the operating statements of certain beneficiaries following 12 months of activities are provided in Table 1.

TABLE 1. Analysis of operating statements (CFAF)

ACTIVITIES	TOTAL EXPENSES	TOTAL INCOME	ANNUAL PROFIT	MONTHLY PROFIT	DAILY PROFIT
M'Bodou Issa (goats in Mao)	369 570	793 225	423 655	35 304	1.180
Patcha Ozias (Pigs in Kim Bongor)	957 331	1 350 000	392 670	32 720	1 090
Caleb Banga (Ducks in Kim Bongor)	348 435	505 500	157 065	13 090	436
Donaba Marcel (Chickens in Béti Doba)	258 953	319 600	60 647	5 054	170
Kouladoumadji Nestor (Sheep in Doba)	355 108	422 300	67 192	5 600	185
Idriss Mahamat (Oum-Hadjer market gardening production)	740 450	2 080 000	1 339 550	111 630	3 720
Abdérahim Mahamat (Bitéa, Abéché Market garden production)	849 750	1 385 000	535 250	44 605	1 485
Djawir Abdelbanat (meat trade)	9 646 833	10 544 200	897 367	74 780	2 490
Arachida Issa (meat trade)	11 569 333	12 430 900	861 567	71 795	2 390
Halimé Béchir (meat trade)	8 222 833	8 867 750	644 917	53 740	1 790
Small trade in Bongor	1 062 900	1 196 000	133 100	11 090	370
Average			501 180	41 765	1 390

The average monthly profit is CFAF 41 765. For most beneficiaries, this profit is higher than the SMIG in force in Chad (CFAF 23 000). The daily profits for most beneficiaries are higher than the daily income selected in the Millennium Development Goals, which is USD 1 per day.

TABLE 2. Assessment of the technical level acquired by the beneficiaries in Chad

FIELDS	INITIAL SITUATION	CURRENT SITUATION
Feed	Farming of natural pastureland and harvest residues Reduction of stocks of leaf stalks and straw of poor quality	Supplementing with bran, cereals, crop residue, fodder crops, oil cakes and concentrated feed; Termites and ants breeding; Important stocks of straw, leaf stalks and cereals for the scarcity periods (March to June)
Health	Little assurance of hygiene for the habitat, the feed and drinking water No isolation of sick animals Occasional treatment of sick animals No vaccination High mortality: 30 to 40 %	Vaccination assured on the basis of a prophylactic programme Assured hygiene of the habitat, feed and watering Isolation of sick animal populations (quarantine) Treatment of sick animals assured (training and support) Support to breeding auxiliaries Mortality reduced to 5 to 20 percent
Habitat	Often the trees, sheds and runs are used as places of refuge for the animals Low and cramped No respect of the density standards Often the trees, sheds and runs are used as animal shelter	Construction of the better adapted huts, enclosures and sheds Density standards are followed.
Management	Animals are left roaming in the dry season and are tiered to pickets in the rainy season in the Sudan area; Widespread practice of gardening in the Sahelian area	Awareness raising of associations and practice of rotational gardening in order to greater enhance the runs and limit theft in the Sudan area Agreed management of the runs by the associations.

The mastery of technical issues by the beneficiaries has clearly improved, particularly those concerning feed, animal health, habitat and herd management, as shown in Table 2.

Repayments for setting up new beneficiaries have begun in several associations. Out of 77 beneficiaries

interviewed: (i) 13 had paid back all the loans before the agreed on due date of three years; (ii) 46 percent of the beneficiaries had provided partial payback; (iii) therefore 49 percent began repaying the first year, which allows to provide loans to 49 new beneficiaries to set up microprojects that will be added to 205 units, which are still operating.

LESSONS LEARNED ON DIVERSIFICATION (LIVESTOCK) EXPERIENCES IN THE SPECIAL PROGRAMMES FOR FOOD SECURITY IN SUB-SAHARAN AFRICA

GOAT PRODUCTION (MAO) MBODOU ISSA (MAO) FARM

Operating Statement

I - Amortization of equipment/Investment

AMORTIZATION OF EQUIPMENT / INVESTMENT	COST (CFAF)	NUMBER OF YEARS OF USE	AMORTIZATION PER YEAR (CFAF)
Habitat	60 500	3	15 125
Supplies and equipment	45 000	4	11 250
Total	169 250		

II – Production expenses (CFAF)

YEAR 1	EXPENSES				REVENUE
	UNIT	QUANTITY	UNIT PRICE	TOTAL PRICE	
1. Equipment/Investment					
Habitat	1	1	15 125	15 125	
Supplies and equipment	-	-	11 250	11 250	
2. Operations					
Feed	-	-		194 695	
Health	-	-		23 500	
Labour					
Purchase of animals				125 000	
Total expenses (1 + 2)				369 570	
	Population	Deaths	Sale	Remainder	
3. Reproduction	66	3	12	51	
Value of farm breeding				51	605 625
Sale: animals			12		142 500
milk					45 000
Total revenue					793 125
Profit					423 555

Without buying animals, the producer will earn CFAF 793 125 – 244 570 = CFAF 548 555.

Hypotheses

1 – Overall mortality rate of 5%, i.e. 4 animal deaths, 62 animals remain for breedings

Value of 62 animals: CFAF 736 250

- Value of 62 animals: CFAF 736 250
- Total revenue: CFAF 736 250 + 45 000 = CFAF 781 250
- Profit (with purchase of animals): CFAF 781 250 – 369 570 = CFAF 411 680
- Profit (without purchase of animals): CFAF 781 250 – 244 570 = CFAF 536 680

2 – Overall mortality rate of 20%, i.e. 14 animal deaths, 52 animals remain for breeding

- Value of 52 animals: CFAF 617 500
- Total revenue: CFAF 617 500 + 45 000 = CFAF 662 500
- Profit (with purchase of animals): CFAF 662 500 – 369 570 = CFAF 292 930
- Profit (without purchase of animals): CFAF 662 500 – 244 570 = CFAF 417 930

DUCK PRODUCTION CALEB BANGA (KIM, BONGOR) FARM

Operating statement

I - Amortization of equipment/investment

AMORTIZATION OF EQUIPMENT / INVESTMENT	COST (CFAF)	NUMBER OF YEARS OF USAGE	AMORTIZATION PER YEAR (CFAF)
Habitat	120 000	3	40 000
Supplies and equipment	18 500	4	4 625
Total	138 500		

Hypotheses

1 – mortality rate of 5%, i.e. 19 deaths, 355 remain for breeding

- Value of 355 birds: CFAF 532 500
- Profit (with purchase of animals) CFAF 532 500 – 348 435 = CFAF 184 065
- Profit (without purchase of animals) CFAF 532 500 – 303 435 = CFAF 229 065

2 – Overall mortality rate of 20%, i.e. 75 deaths, 299 remain for breeding

- Value of 299 birds: CFAF 448 500
- Profit (with purchase of animals): CFAF 448 500 – 348 435 = CFAF 100 065
- Profit (without purchase of animals): CFAF 448 500 – 303 435 = CFAF 145 065

II – Production expenses (CFAF)

YEAR 1	EXPENSES				REVENUE
	UNIT	QUANTITY	UNIT PRICE	TOTAL PRICE	
1. Equipment /investment					
Habitat	1	1	40 000	40 000	
Supplies and equipment	-	-	4 625	4 625	
2. Operations					
Feed	-	-		230 135	
Health	-	-		28 675	
Labour					
Purchase of animals				45 000	
Total expenses (1 + 2)				348 435	
	Population	Deaths	Sale	Remainder	
3. Reproduction	374	37	289	48	
Value of the farm breeding				48	72 000
Sale			289		433 500
Total income					505 500
Profit					157 065

Without purchase of animals, the farmer will make a profit of CFAF 505 500 – 303 435 = CFAF 202 065.

ANNEX 7

OPERATING STATEMENTS OF UNITS IN THE NIGER

1. Poultry unit

- Activity: Aviculture
- Location: Banikané, Say
- Producer: Boubacar Soumana
- Age: 31 years
- Association: Dougazabane
- Household size: 6 people
- Duration: 7 months
- Capital: CFAF 105 000

TABLE 1. Poultry unit: operating statement

EXPENSES		PRODUCTS	
ITEMS	AMOUNT (CFAF)	ITEMS	AMOUNT (CFAF)
Purchase of ducks (33)	42 000	Sale of eggs	25 000
Purchase of geese (8)	12 000	Self-consumption	3 500
Purchase of hens (3)	3 750	Miscellaneous grants	8 000
Feed	9 500	Sale of poultry	48 000
Fees	57 800	Population growth	
Other fees	34 000	- ducks	72 000
		- value of guinea fowl	45 000
		- geese	3 000
		- hens	2 500
Total	159 050	Total	207 000
Net profit: 207 500 – 159 050 = 47 950			

2. Sheep fattening unit

- Activity: Sheep feeding
- Location: Goungobon, Say
- Farmer: Mme Kadi Amadoua
- Age: 35 years
- Group: Bonhaweyban: 25 members
- Household size: 7 people
- Duration: 5 months
- Capital amount: CFAF 105 000

TABLE 2. Sheep fattening unit: operating statement

EXPENSES		PRODUCTS	
ITEMS	AMOUNT (CFAF)	ITEMS	AMOUNT (CFAF)
Purchase of 3 rams	41 000	Sale of 3 rams	81 000
Purchase of 1 young bull	45 000	Sale of young bull	90 000
Purchase of feed	15 000	Sale of manure	65 000
Purchase of water	3 000		
Prophylaxis	2 500		
Building of a shelter	5 000		
Manpower	37 500		
Total	149 000	Total	236 000
Net profit: CFAF 236 000 – 149 000 = CFAF 87 000			

TABLE 3. Balance statement of sheep fattening, communes of Téra and Kourtey (over 2 years or two Tabaski festivals), Niger

BENEFICIARIES	STARTING POPULATION	NO. OF FATTENING OPERATIONS	TOTAL NO. OF SHEEP POPULATION FATTENED	DEATHS	ANIMALS FATTENED AND SOLD	EXPENSES (CFAF)			PROFIT (CFAF)
						REVENUE (CFAF)	PURCHASE OF ANIMALS	FEEDING AND MAINTENANCE	
Idrissa	9	2	17	5	12	428 500	370 000	81 500	-23 000
Hamadou	10	2	18	3	15	650 000	350 000	156 000	142 000
Amina	10	2	20	2	18	670 000	436 000	97 950	136 050
Aissa	10	2	20	0	20	820 500	503 500	147 000	170 000
Total	39	8	75	10	65	2 569 000	1 659 500	482 450	424 450
Average	10	2	19	2,5	16	642 250	414 875	120 600	106 263

TABLE 4. Operating statement of some breeding units (CFAF)

LAST NAME, FIRST NAME	EXPENSES (EXCLUDING AMORTIZATION)	REVENUE (SALE OF ANIMALS AND RESIDUAL VALUE OF THE DROVE)	PROFIT
SHEEP BREEDING UNIT			
Beidari Hamidou	317 800	642 500	324 700
Idrissa Djibo	331 850	470 000	138 150
Salleye Seidou	285 250	370 000	84 750
Djibo Issa	394 700	420 000	25 300
Mariama Samba	454 200	742 500	288 300
Hassane Mamoudou	347 450	848 500	501 050
Hadjo Samba Djibo	389 000	680 000	291 000
GOAT BREEDING UNIT			
Niandou Inoussa	447 000	684 500	237 500
Gambina Souley	385 000	565 000	180 000
Dari Ibrahim	394 950	590 000	195 050

Source: FAO (2009.)

ANNEX 8

DEFINITIONS FOR CALCULATING PROFITABILITY

Cost-effectiveness of an operation

Cost-effectiveness can be defined as the likelihood that an operation brings supplementary advantages with respect to resources utilized for its implementation. There are various types of cost-effectiveness, but those of interest herein are financial and economic.

1. FINANCIAL COST-EFFECTIVENESS

Financial cost-effectiveness is, for an economic operator, the relationship between supplementary financial resources resulting from an operation and the financial resources used to carry it out. It is expressed as a percentage. The resulting supplementary financial resources are called profits, and the financial resources utilized correspond to the upfront investment.

There are several types of financial cost-effectiveness calculated, including:

- simplified cost-effectiveness;
- overall cost-effectiveness of the investment; and
- internal rate of return.

• Simplified cost-effectiveness

This is the relationship between average annual profit and investment, where p = average annual profit, I = investment and profitability $P = p/I$.

• Overall cost-effectiveness of the investment

The overall profitability of the investment is the relationship between the total resulting profit over the duration of the project and the investment, where P = total profit, I = investment and profitability $P = p/I$.

Remarks: the last two profitabilities can be determined with or without actualization by relying on the benefit and the investment, whether it is made or not.

• The internal rate of return

The internal rate of return is the actualization rate that cancels the actualized profits. It corresponds to the real contribution of the operation by enriching the invested capital. It is generally determined by using a graphic solution or resorting to mathematical formulae.

Uses of financial profitabilities for decision-making

The financial profitabilities are calculated to assist decision-making in carrying out or rejecting operations prior to their start-up, at the level of the private operator.

At the level of the operator, an operation can only be selected if it yields profit in terms of supplementary resources with respect to the resources used for its implementation. This assumes positive profitability. However, positive profitability, although necessary, is not a sufficient condition. It must be compared to profitabilities of alternative operations carried out by the operator. If this positive profitability is surpassed by the alternative one, the latter will automatically replace the former.

Among the alternative operations available to the operator, the placement of the sum to be invested in the bank where profitability would correspond to the interest rate must also be included. Indeed, the main objective for the operator is to maximize the net revenue.

2. ECONOMIC COST-EFFECTIVENESS

For a community, economic profitability is the relationship between supplementary resources resulting from an operation and the resources used for its implementation. Just as for financial profitability, it can be expressed in percentages.

For economic profitability, the profit is represented by the net added values yielded and available for the community, even if for many goods, adjustments can be made at the price level to take into account distortions linked to the lack of correspondence between the market price and the price reflecting the costs and true advantages of the goods for the community.

Remarks: Economic profitability is a decision-making tool for public investment, obeying the same principles as financial profitability for the private operator.

TABLE 1. Data collection sheet for production costs

TYPE	INITIAL COST	DURATION OF USE	ACTUAL VALUE
<ul style="list-style-type: none"> - Supplies - Herd (males and females for production) - Infrastructures (wells, fodder, enclosures, stables, poultry houses) 			
Operations			
<ul style="list-style-type: none"> - Feed - Veterinary care - Gardening - Other labour costs - Small supplies - Purchase of animals - Rental costs (land) - Interest on loans - Taxes and charges 			

TABLE 2. Values of production and other advantages

TYPE	QUANTITY	UNIT PRICE	TOTAL VALUE
<ul style="list-style-type: none"> - Eggs - Milk - Live animals - Manure - Fodder - Donations and grants received - Fees for services provided or for renting equipment or spaces 			

TABLE 3. Mobilization of capital

OWN FUNDS	LOANS	TOTAL

TABLE 4. Loan system

LOAN AMOUNTS	DONORS	REPAYMENT ANNUITIES	INTEREST RATE

ANNEX 9

SOME PRODUCTIVITY PARAMETERS

TABLE 1. Parameters of village aviculture productivity

PARAMETERS	VALUES
Ratio	5 hens/rooster
% viability (2–12 months)	0.75
Eggs/layer/hen	15
Number of clutch/year	3
No. of eggs/hen/year	45
Total no. of eggs/year	225
% eggs consumed	0.15
No. of eggs consumed	34
No. of eggs to be brooded	191
% of chicks hatched	0.90
Number of chicks hatched/year	172
Number of chicks (0–2 months)	129
Number of chickens (2-12 months)	97
Number of kg of meat/breeding female/year	11.5
Number of kg of eggs/breeding female/year	0.6

Sources: *Rapport filière avicole Schéma Directeur élevage Cameroun (Aviculture sector report, Breeding Master Plan Cameroon 2009)*

TABLE 2. Financial results (CFAF) of a traditional farm (5 hens, 1 rooster)

PARAMETER OF PRODUCTIVITY	
Meat production/chicken/year (kg)	11.5
Egg production/hen/year (kg)	0.6
Net farming results	
Farmgate cost price of chicken	198
Farmgate cost price of egg	6
Net margin per chicken	1 600
Net margin per egg	50
Net revenue generated/breeding female/year	9 600

TABLE 3. Financial results (CFAF) of a primary collector of chicken

PARAMETERS	
No. of chicken per basket	10
No. of baskets collected	2
Frequency of collection/year	48
Farmgate cost price/chicken	1 800
Cost of collection/basket	150
Sale price/basket of secondary collector	2 100
Net margin/year (CFAF)	294 000

Table 3 shows that it is, above all, the primary collector who earns the most income in the traditional system, with a net margin of at least CFAF 294 000/year.

TABLE 4. Financial results of an average, semi-intensive broiler chicken farm in Cameroon (500 animals per batch)

ITEM	COST (CFAF)
Preparation of the poultry house	
Disinfection-downtime	6 000
Bedding	7 000
Poultry house	
Chicks	177 500
Heating	10 000
Feed demurrage charges	252 000
Medical and health prophylaxis	20 000
Breeding	
Finishing feed	337 500
Medical and health prophylaxis	20 000
Labour	15 000
Marketing	
Breeding tax	2 500
Transportation	5 000
Other miscellaneous costs	6 000
Net results of the operation	
Farmgate cost price of chicken (CFAF/chicken)	1717
Farmgate cost price chicken (CFAF/kg)	953
Farmgate cost price of manure (CFAF)	11 500
Net margin per chicken (CFAF)	283
Net margin per batch of 500 chicks (CFAF)	135 840

TABLE 5. Financial results of a medium-scale semi-intensive broiler chicken farm in Cameroon (2 500 per batch)

ITEM	
Preparation of the poultry house	
Disinfection-downtime	30 000
Bedding	35 000
Poultry house	
Chicks	887 500
Heating	50 000
Feed demurrage charges	1 260 000
Medical and health prophylaxis	150 000
Breeding	
Finishing feed	1 687 500
Medical and health prophylaxis	100 000
Labour	75 000
Marketing	
Breeding tax	10 000
Transportation	25 000
Other miscellaneous expenses	
Net results of the farming	
Farmgate cost price of chicken (CFAF/chicken)	1724
Farmgate cost price of chicken (CFAF/kg)	907
Farmgate cost of manure	52 500
Net margin per chicken (CFAF)	326
Net margin per batch of 2 500 hens (CFAF)	798 700

LESSONS LEARNED ON DIVERSIFICATION (LIVESTOCK) EXPERIENCES IN THE SPECIAL PROGRAMMES FOR FOOD SECURITY IN SUB-SAHARAN AFRICA

TABLE 6. Financial results of a retailer in Cameroon (all figures per year)

PARAMETER	
No. days attending market	144
No. chickens sold	4 320
Chicken feed at the market (CFAF 24/chicken)	103 680
Fees	
Wholesale purchase of chickens	9 072 000
Interurban transportation (CFAF 5/chicken)	21 600
Right of occupancy (CFAF 150/day)	21 600
Business tax	20 000
Retailer's meals (CFAF 250/day)	36 000
Informal tax (CFAF 5/chicken)	21 600
Sale of chickens	10 800 000
Margin/year	1 607 200
Margin/chicken	372

TABLE 7. Estimate for a pig unit with 16 piglets in the first year, Burkina Faso (CFAF)

ITEM	AVERAGE		TOTAL	
	CONTRIBUTION OF BENEFICIARY	FINANCING NEEDS	AMOUNT	%
2 Sows		80 000	80 000	13
1 Boar		50 000	50 000	8
Feed	103 680	172 800	276 480	46
Medicines		50 000	50 000	8
Habitat	71 050	73 950	145 000	24
Total	174 730	426 750	601 480	100

TABLE 8. Estimated operational statement of a pig unit, Burkina Faso (CFAF)

ITEM	AMOUNT OVER 3 YEARS			
	YEAR 1	YEAR 2	YEAR 3	
Products				
Sale of pigs	900 000	450 000	450 000	
Sale of manure	70 000	20 000	25 000	25 000
Total	970 000	20 000	475 000	475 000
Charges				
Habitat	100 000	33 400	33 300	33 300
Amortization of animals	125 001	41 667	41 667	41 667
Feed	166 500	55 500	55 500	55 500
Veterinary products	73 500	24 500	24 500	24 500
Labour	216 000	72 000	72 000	72 000
Total	681 001	227 067	226 967	226 967
Result	288 999	-207 067	248 033	248 033
Monthly revenue		20 669	20 669	

The farm operating statement was calculated according to a hypothesis of a single birth per sow in the first year and two births per sow in subsequent years. Moreover, in the second year, there are plans to build a supplementary lodging for the piglets.

TABLE 9. Estimated cost of an aulacode unit, Burkina Faso (CFAF)

ITEM	TOTAL COST	CONTRIBUTION OF BENEFICIARIES	CONTRIBUTION OF FAO
Aulacodes: 2 males and 10 females	257 000		257 000
Habitat	286 500	94 000	192 500
Feed	468 750	413 750	55 000
Care	30 000		30 000
Equipment	100 000	34 500	65 500
Total	1 142 250	542 250	600 000

TABLE 10. Operating statement of an aulacode unit, Burkina Faso (CFAF)

ITEM	YEAR 1	YEAR 2	YEAR 3
Products			
Sale of aulacodes	1 200 000	2 400 000	2 400 000
Total	1 200 000	2 400 000	2 400 000
Expenses			
Habitat	143 250	143 250	0
Animals	128 500	128 500	0
Feed	234 375	234 375	234 375
Equipment	50 000	50 000	0
Care	15 000	15 000	15 000
Labour	73 000	73 000	73 000
Total	644 125	644 125	322 375
Result	555 875	1 755 875	2 077 625
Monthly income	46 322	146 322	173 135

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