Local poultry: *a rural development resource* in West Africa

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In sub-Saharan Africa, where food security is a vital consideration in all sustainable development initiatives, poultry stands out as a thriving channel of subsistence or commercial production that deserves encouragement. It is available to the poorest, and in particular to women at home. In that context, this project focused on how to manage livestock populations more sustainably over the long term through better knowledge of their zootechnical and genetic characteristics.

The project **"Morphological, zootechnical and genetic characterization of local poultry populations *(Gallus gallus)* in the coastal countries of West Africa"** was implemented in three countries on the coast of West Africa: Benin, Côte d'Ivoire and Ghana. Two different agroecological zones as project sites were selected for each country: a forested area in the southern region of each of the three countries, a savannah area in northern Ghana and Benin, and in the centre of Côte d'Ivoire.

The project, which was started in October 2005 and ran for two and a half years, involved graduate and agricultural research teams in all three countries and in France. It also involved rural people and development agents (NGOs, technical services…) in the process. The project's main objective was to take advantage of local poultry populations while using local food resources to increase farmers' income and ensure food security.

Poultry: an economic *and food resource suited* to the region

Poultry is an important livestock component in the humid regions of sub-Saharan Africa, where cattle farming is limited by trypanosomiasis[1]. In these regions the number of birds is estimated at 1.5 billion, representing over 70% of the total number of birds in Africa.

Local populations account for 80% of Africa's total poultry stock, representing 25-70% of its meat and 12-36 % of its egg production. The total value of poultry production is estimated at 4,025 billion CFA francs, or about 100 billion euros.

Family-farm poultry production is popular and widespread for several reasons:

- given its short life cycle, chicken is a highly renewable resource;
- local poultry populations are suited to difficult poultry raising conditions (poor diet, little or no vaccination coverage);
- capital and production costs are low compared to selling price, making it an attractive source of income;
- meat and eggs are highly valued by the people and are important sources of protein.

Identifying the strengths *and weaknesses of* traditional husbandry

For information collection and the validation of methodologies for poultry characterization, this project pursued two major activities:
- surveys to identify farmers' production systems and the characteristics of local hens; and
- experiments designed to characterize the poultry populations involved: molecular and phenotypic characterization (morphological features such as colour of plumage, skin and egg, plumage structure, size, skeleton, comb type etc.) and zootechnical performance.

In each country two experimental flocks were established (savannah

1. An endemic fatal parasitic disease caused by flagellated protozoans and transmitted by blood-sucking arthropods. Human African trypanosomiasis (HAT) is also called "sleeping sickness" and is transmitted by the tsetse fly.

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▲ *Poultry is an important component of animal farming in the humid regions of sub-Saharan Africa.*

and forest) made up of birds purchased in the villages during the surveys. These flocks were reared at research stations. Genetic variability within and between populations was estimated through molecular polymorphism analysis. Genotyping using the microsatellite method was also carried out. Approximately 500 blood samples and DNA extractions were collected.

The growth and laying performance of the descendants of the original breeding nuclei were evaluated: reproductive traits (number of eggs laid, hatching rate and chick viability) and production characteristics (mean egg weight, weight at various ages, carcass quality). Finally, taste tests were done to identify all characteristics of the local poultry populations.

Managing animal *genetic resources*

To allow comparison between countries and between populations within a country, two actions were taken: breeding nuclei from local fowl populations were purchased and placed in breeding stations, and crosses were done with *Label Rouge* chickens (T55 × SA51). Local cocks were mated with *"Label Rouge"* hens. The performance of their offspring was measured (growth traits, egg-laying and feed efficiency), a high-yielding population was stabilized and chicks with higher growth potential were returned to farmers.

This approach, like the use of local poultry resources, is part of an overall sustainable animal genetic resource management strategy. The endeavour will need to be carried further by retaining the breeding nucleus and multiplying it to continue to improve it by selection.

Reducing *chick mortality*

In traditional poultry husbandry, there is a high mortality rate among chicks from hatching to weaning. Farm typology surveys have shown that most deaths are observed in young subjects and are due to predators (raptors, snakes, etc) and accidents (drowning or being run over by cars or motorcycles). Diseases are in third place.

This research project allowed the identification of the diseases that occur in each agroecological zone, the season at which they occur, their frequency etc. It has allowed for the development of an integrated health and medical prophylaxis program.

Different feeds made from local products were also offered based on the age of animals as well as their energy, protein and mineral needs. Models for simple and inexpensive coops were also tested and popularized.

Likewise , the experiments done by the CGDRAV NGO are particularly remarkable. In the course of those experiments, chick mortality fell from 43.95 to 16.23% between hatching and one week of age. This was accomplished by improving the diet and living conditions of the animals and by following an appropriate preventive health program. The experiments were carried out with the pilot poultry raisers whose participation was of utmost importance to the project. They acted as the interface between researchers and users, and are now serving as a reference point for other producers. •••

◀ Traditional poultry farming also features a high chick mortality rate from hatching to weaning.

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Encouraging an activity *suited to vulnerable* population groups

In choosing varieties in the light of food security priorities, the development of poultry farming deserves particular encouragement. It reduces poverty and enhances household nutrition by adding animal protein. As such, local poultry makes the best and obvious option: it is the only animal production system within the reach of the local population from all social strata, and especially among women who have shown a keen interest in the industry. Accordingly, women's groups have been trained in poultry farming to involve them in project implementation and in the development of strategies to improve poultry farming in rural areas.

Likewise, a special partnership was formed with all local farmers who were made aware of the project's value and objectives. Four farmers' associations were organized and trained on appropriate coop construction, diet formulation and stock management.

The importance of the conservation and utilization of genetic resources was impressed upon the local people, who actively participated by responding to questionnaires and provided local chicken varieties for breeding. During the surveys, however, some farmers refused to sell the birds required for the breeding nucleus. An awareness campaign needed to be done before the desired numbers could be collected. This called for patience, perseverance, thorough explanations and mutual understanding.

Easing access to *sustainable development*

Up until that time, poultry production development endeavours had most often involved programs to transfer the technologies and germplasm used in industrialized countries, without taking into account sustainable development factors.

This project's strategy focused instead on how to manage livestock populations more sustainably over the long term through better knowledge of their zootechnical and genetic characteristics.

Four research structures, two NGOs, three development structures and five professional organizations were mobilized, as well as individual farmers. The project strengthened interactions between the partners and stakeholders and produced meaningful results that can be successfully extended to other African countries. ■

Partnership

Project leader: *École Polytechnique d'Abomey-Calavi (EPAC), Université d'Abomey-Calavi*, Benin

Partners: *Centre National de la Recherche Agronomique* (CNRA, Côte d'Ivoire), *Faculté d'Agriculture et de l'Alimentation de l'Université de Legon* (Ghana), *Centre de Gestion Durable des Ressources Animales et Végétales* (CGDRAV_ONG, Benin), *National Institute for Agricultural Research* (INRA, France).

Countries involved: Benin, Côte d'Ivoire, Ghana

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