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Lessons learned and the way forward to family poultry development

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***Mr. Antonio Rota**'s career includes twenty five years of professional experience in pro-poor farming systems and livestock development, working since 1986 with NGOs, private consulting firms and FAO, mostly in Sub-Saharan Africa, Asia, Latin America and the Caribbean. His career with IFAD began in 2000 as a consultant, leaving in 2004 to join FAO as Livestock Adviser in Afghanistan, where he was responsible for the implementation of the "Rural Poultry Production" and "Integrated Dairy Schemes" Development Projects. He re-joined IFAD in 2006 as Senior Technical Adviser on Livestock and Farming Systems and since then, among his various responsibilities, he has been particularly proactive, launching a Community of Practice for Pro-poor Livestock Development (www.cop-ppld.net). Mr. Rota coordinates the CoP with the specific objective of promoting livestock as a tool for poverty reduction. He is also a promoter for the integration of livestock-crop systems, conservation agriculture principles and production of biogas as means for sustainable agriculture intensification and climate change mitigation throughout IFAD funded projects.*

The essential role played by family poultry development for food security, women's empowerment and income generation has been widely recognized by the international community, technical experts and research, as well as policy makers and governments. In a number of developing countries, family poultry represents up to 80 per cent of the aviculture sector generating considerable employment opportunities in rural and peri-urban areas, especially for women. Nevertheless, this sector has never received the necessary attention from national policy and decision makers, international donors and research institutes. Only further to the crises generated by Highly Pathogenic Avian Influenza (HPAI) and due to the rising cost of producing food, considerable interest has been spurred both at the national level and within the "donor community" in supporting family poultry development projects. However, promoting family poultry presents several challenges. On one side, there is a recurrent call for the "modernization" of "traditional" family poultry production systems, which are often dismissed as "non-productive". On the other side, projects supporting family poultry are not properly tailored to the needs and capacity of rural populations. Furthermore, in some cases, such projects promote approaches and practices that are not sustainable, or simply "do not work" in the long term. Over the past few years, some NGOs, national research institutes and international organizations such as FAO and IFAD felt the need to address these challenges and initiated processes for the identification of "good practices" and "lessons learnt" from successful projects. The ultimate objective was to contribute to design viable development projects and formulate adequate national policies in support of family poultry. In this regard, the International Network for Family Poultry development (INFPD) and initiatives such as the South Asia Pro-Poor Livestock Policy Programme (SAPPLPP) play a crucial role in creating opportunities and platforms for sharing knowledge and building capacities on such good practices. Likewise, in the context of the IFAD-funded "Smallholder Poultry Development Programme" implemented by INFPD/FAO, a "Decision tool box and check lists for project design and implementation" will be prepared in collaboration with the International Rural Poultry Centre (IRPC, KYEEMA). This article intends to provide some initial "food for thoughts" on how to improve the design and enhance the impact of projects supporting family poultry development.

Concerning project design, it is key to responding to the diverse and specific needs of family poultry producers located in different areas (remote areas, peri-urban areas, etc.). "One size fits all" approaches that apply the same model to all beneficiaries should be avoided. Important aspects that are worth considering are the distance between the location of poultry producers and the markets (not only for selling products, but also for accessing inputs such as feed, vaccines and day-old- chicks) as well as their capacity to access services (veterinary services, credit, training).

In remote areas, where there is limited access to inputs, markets and services, the objective of projects should be promoting family poultry as a means of improving food security and possibly increasing income generation, through marketing of surplus production within the village or nearby weekly markets. Therefore, the main effort should be to minimize the main risk for poultry producers, notably high mortality of birds caused by diseases, predation, climatic

vagaries and theft. Projects should support rearing birds of local breed, promote improved poultry coops using local building material, ensure viable and regular access to vaccination against Newcastle disease and Fowl Pox (or any other major disease affecting project areas), adopt better brooding techniques, protecting chicks up to one month of age, and improve feeding.

Unfortunately, there are still projects that in such remote areas are promoting the rearing of "improved" poultry breeds, the utilisation of commercial feeds and the delivery of vaccines, veterinary drugs and supplies in form of "technical packages". These inputs are normally sourced and transported from outside the project area and are normally distributed for free or at subsidized prices. The general outcomes of such practices are that poultry rearing stops as soon as the project ends; a continued request for or dependency on inputs, especially for feeds and day-old-chicks, are generated at community level; and beneficiaries end up selling or consuming "improved breed" birds distributed by projects for stocking (or re-stocking) purposes shortly after they have received them, this results in a general impression that poultry projects "do not work" for poverty reduction.

The closer a smallholder producer is to markets and the easiest is her/his access to inputs and services, the more "intensive" production system may be promoted under a project. Its objective would gradually shift from food security to income generation and more attention would be paid to the economic viability and return of the promoted activities. There would be different degrees of intensification that could be considered depending on market demand. For instance, in peri-urban areas, it would be more appropriate to promote the utilisation of "improved" dual purpose or specialised breeds (broilers or layers), the creation of small feed production units or the utilisation of commercial feeds, the construction of technically advanced poultry housing, the establishment of commercial incubators and input shops as part of the project design.

Another aspect that is often discounted in project designs is the capacity building component of family poultry producers. Very often the project design for capacity building includes short training sessions (an average of two training days per person) on rural poultry rearing. Evidence shows that such forms of training are rather poorly effective and result in a low rate of uptake of proposed activities. Hands-on training, exchange visits for smallholder producers, follow-up provided by technical agents have all proven to be a more effective way for building capacity. The investment cost per person is higher but it is offset by greater project effectiveness . Women are often the main target group of family poultry development projects. It is important to tailor capacity building activities to their needs and conditions, and considering their heavy workload at the household level. Female trainers have proven to be more effective than male trainers in providing training to the women, especially in traditional communities. From experience, it also emerged that in order to encourage young people to raise poultry, it is necessary to adopt innovative ways of communication (through radio and video programmes) and a language ("slang") that will draw their attention. In this sense, training materials should be also tailored to the capacity of final users. Writing in the local language and using drawings or pictures rather than long texts, has demonstrated to be more effective. Finally, sharing local and traditional knowledge among project beneficiaries should always be promoted.

The selection of knowledgeable, efficient and committed Service Providers and technical staff is an essential element of a successful project. There is a need for ~~a~~ solid logistic and technically diversified capacity in order to support rural poultry producers, especially during the first phase of the project development in which community mobilization, training of trainers and beneficiaries, and technical backstopping need to be provided.

Projects that support interventions only in specific areas of family poultry, for instance a vaccination program or cock distributions, have a limited impact on family poultry production. If international donors wish to make a real impact on poverty reduction to contribute achieving the Millennium Development Goals (MDGs), it is necessary to switch from relatively small investments in selected areas within a country to larger investments with a broader programmatic approach and with a national coverage. Such investment programmes should be well phased, promote holistic approaches and facilitate the development of an enabling framework as follows:

- Raising awareness of decision-makers in national governments and donor agencies about the effectiveness of family poultry as a tool for poverty reduction and building their capacity to develop effective policies, incentives and development programmes;
- Developing and enforcing consistent national pro-poor policies, which are crucial to capitalise on the opportunities offered by the increasing demand for poultry (and in general, livestock) products;
- Including smallholder livestock development in the curriculum of technical education institutions to train a new generation of advisors/researchers;
- Supporting the creation of livestock farmers institutions that can help their members to voice their needs and facilitate the provision of services and inputs to the farming communities;

- Funding participatory adaptive research to identify appropriate technologies/models that are pro-poor, sustainable, economically viable and environmentally sound. This includes sharing knowledge generated by farmers;
- Identifying market-led approaches supported by effective, accessible, qualitative services (breeding, veterinary services, credit, processing, marketing, extension, training, etc.) and infrastructure;
- Implementing effective smallholder livestock development activities with potential to generate further knowledge and data, capitalize on relevant learning generated and facilitate up-scaling of appropriate innovations in other projects;
- Supporting knowledge sharing platforms and networks through which innovative "field tested" technologies, good practices and lessons are made available, and where new knowledge and mutual learning through peer-to-peer exchange are promoted.

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TRAINING REPORT | RAPPORT DE STAGE | INFORME DE FORMACIÓN No 1:

Understanding the value chain and critical risk factors of duck production in Egypt

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Introduction

Egypt is an important "duck country", there are likely between 35 and 55 million ducks in the backyard sector, plus approximately 5 million ducks in commercial farms (Hogerwerf and Sidding, 2007). Duck husbandry in Egypt, mainly concerns the household and is a key element in the livelihood of the lower strata of the rural society (Geerlings, 2010 and Hogerwerf and Sidding, 2007). Women are almost exclusively responsible for household duck rearing. The "household ducks" and other poultry are not necessarily located in the backyards (Geerlings, 2010; Fasina *et al*., 2011); they are also kept inside family houses on a separate floor or in a separate room or on rooftops, in rural and also (peri-) urban settings. Some of the ducks scavenge outside on the streets, near the canals, or in post-harvest agricultural fields during the daytime (Ali *et al*., 2011b). Ducks in farms on the contrary, are almost exclusively owned by men. And so are traditional hatcheries, where both duck and *Baladi* chicken eggs are hatched. (Hogerwerf and Sidding, 2007 and Ali *et al*., 2009). Production is highest in the spring and associated also with religious feasts such as Ramadan[1] (Ibrahim, 2009 Ali *et al*., 2011c). During spring, feed is available and is relatively cheap. The weather in spring is also optimal for duck production as fattening takes lesser time and duckling mortality is low (Hogerwerf and Sidding, 2007).

Highly Pathogenic Avian Influenza (HPAI) H5N1 was introduced in Egypt in the beginning of 2006. The first epidemic wave mainly concerned farms but there were also outbreaks in backyard poultry. During summer 2006 no further outbreaks were recorded, but outbreaks in poultry as well as human cases were diagnosed again late-2006 and in the spring of 2007. This time, outbreaks in poultry occurred mainly in the backyard (Howerfer and Siddig, 2007). A total of 151 human cases has been confirmed since 2006 in Egypt with 52 fatal cases. In the year 2011 were confirmed a total of 361poultry outbreaks (Govs 2011), and most of household outbreaks attributed to newly purchased waterfols or adult *Baladi* chicken (Ali *et al*., 2011b).

The Highly Pathogenic Avian Influenza (HPAI H5N1) presents the highest peaks of outbreaks, within the months from January to March, followed by a low season from April to December (NLQP)

Locations and characteristics of field assignment

Most of the duck production is located in the Nile delta region of the Nile River (Lower Egypt) (Fasina *et al*., 2011; Ali *et al*., 2009, 2011), followed by Sanabu and Kamboha villages in Assuit governorate (Upper Egypt) (Ali *et al*., 2009). The study aimed to understand the role of the different actors in the duck value chain in Egypt, A team traveled from Cairo to, Gharbia, Behera, Qalubya and Sharkia Governorates to conduct the present study interviewing the various experts and stakeholders in the duck value chain, in the different kinds of production types (commercial farms, traditional hatcheries, modern hatcheries, semi automatic hatcheries, breeder farms, live bird markets, feed mills, feed distributors and bird traders) to have a better understand of what's happening in the duck value chain and the role of the different stakeholders.

[1] Ramadan starts at the end of the 8th month of the lunar calendar (Sha'ban), Ramadan lasts 29-30 Days.

Table 1: Locations visited: (coordinates in Universal Transversal Mercator format UTM) (see annex 1 for maps)

Location	Grid zone	Easting	Northing	Altitude (mts)	Distance From Cairo city (kms) [2]
Behera Gov.	36R	257602mE	3435984mN	21	130.5
Berna Village ,Ghabia	36R	299524mE	3414201mN	48	92.9
Breeder Farm, Sharkia	36R	352879mE	3353485mN	93	38.1
Live bird market, Cairo	36R	341694mE	3325649mN	120	14.8
Parent Stock farm	36R	346653mE	3355636mN	32	35.5
Nile delta covers 240 km of the Mediterranean cost line and from south to north and from north to south Delta is approximately 160km in length[3].					

This picture shows traders, having lunch while the birds are in the cage; traders move from farm to farm without changing clothes and footwear and disinfect the equipment and vehicle.

Traders play an important role in the spread of diseases and just few of them are conscious of this situation (Negro Calduch, 2010)

Picture 1: Middlemen in Egypt *[Photo: E.L. Bailey L.]***.**

Relevance and situation of family duck production

Egypt's duck production is continuous throughout the year with a considerable increase in the first 5 months of the year before the hot season (July-August) (Geerlings, 2010; Fasina *et al*., 2011; Ali *et al*., 2011b); and also increases 3-4 months before Ramadan (Hogerwerf and Sidding, 2007; Ali *et al*., 2001b; producers' opinions) which is the 8th month of the moon calendar. National Laboratory for Quality Control of Poultry Production reports that the highest peaks of HPAI outbreaks happens from January to May each year since 2006 (non published data) this outbreaks are linked to the time of the year and when the duck population is higher in the country. Duck sector in Egypt is the second in importance after the chicken sector, 46% of household producers, who have any poultry, will have ducks (Ali *et al*., 2011c) ; these findings linked that most of the poultry is located in the rooftops or in places without the proper fences (Fasina *et al*., 2011) and the fact that the ducks are capable of being sub clinically infected from avian influenza virus (FAO, 2009b), represent a high risk of dissemination of the Avian Influenza virus between species and the persistence of the virus in the environment.

As long there are no any polices for duck farming in all the sectors of the duck value chain, there is a poor biosecurity and no strategies of bio containment and bio exclusion when facing an Avian Influenza outbreak.

[2] Distance measured using Motion X GPS Software in straight line

[3] Source: Motion X GPX software

Poultry are coming from different places and then they are mixed with other species.

Picture 2: Live bird markets in Egypt *[Photos: E.L. Bailey*

Activities undertaken

Published data regarding previous studies, publications and reports about the duck value chain and production in Egypt were reviewed. Interviews were conducted with all the different actors of the duck value chain in Egypt, from day-old ducks (DOD) importers to the household producer. The objective was to obtain the most current situation of the duck value chain in order to describe the role played by the different actors and the risk factors for the Highly Pathogenic Avian Influenza Disease in Egypt.

Major findings

- The duck sector in Egypt is the second in importance after the chicken sector, 46% of household producers, who have any poultry, will have ducks (Ali *et al*., 2011c). This finding linked that most of the poultry is located in the rooftops or in places without the proper fences (Fasina *et al*., 2011), and the fact that the ducks are capable of being sub-clinically infected from avian influenza virus (FAO, 2009b) represents a high risk of dissemination of the Avian Influenza virus between species and the persistence of the virus in the environment.
- The duck value chain in Egypt (Muscovy, Peking and Mule) begins with the importation of DODs from France. Ducklings are moved to from the Cairo airport to quarantine farms for up to two weeks, and they are vaccinated against H5 influenza virus; however it has been demonstrated that the Peking and the Muscovy ducks respond differently to vaccination with H5N1 HPAI inactivated vaccine where the Muscovy is more susceptible to the Avian Influenza disease (Cagle *et al*., 2011). The Mule duck is more resistant to field exposure than the other breeds raised in Egypt (according to private veterinarians and producers opinions). At the household level, people do not use to vaccinate their ducks against Avian influenza, and the *Baladi* breed is raised at this level, which increases the risk of having an outbreak of Avian Influenza.

- Egypt's duck production is continuous all over the year with a considerable increase in the first 5 months of the year before the hot season (July-August) (Geerlings, 2010; Fasina *et al*., 2011; Ali *et al*., 2011b). Also increases 3-4 months before Ramadan (Hogerwerf and Sidding, 2007; Ali *et al*., 2001b; producers' opinions) which is the 8th month of the moon calendar. National Laboratory for Quality Control of Poultry Production (NLQP) reports that the highest peaks of HPAI outbreaks happen from January to May each year since 2006 (unpublished data). These outbreaks are linked to the period of the year and when the duck population is higher in the country (Hassan *et al*., 2011). In the summer 2011 (August), 5 positives cases were found from 182 flocks of 927 apparently healthy ducks. These findings and the reports from the NLQP indicate that the Influenza virus persists in the duck population during all the year even in the hot summer season where the outbreaks are lower.
- Live bird markets play an important role in the spread of diseases (FAO, 2009). Due to the consumer preference, most ducks are marketed alive (Ali *et al*., 2011c). At this point several birds are conveyed from different places and are sold to a different location, biosecurity controls and quarantine measures are completely missing at this point of the value chain (Ali *et al*., 2011b), and most of the live bird markets are illegal since the legislation of 1997 (FAO, 2009). Therefore, there is no strict veterinary inspection to protect the human health and food safety (Ali *et al*., 2011b; FAO, 2009).
- Vaccination against Avian Influenza is missing in some parts of the value chain, like at the household level (Fasina *et al*., 2011). In farms of the sector 3 sometimes, flocks are vaccinated using just one single dose (Private veterinarian's opinion). These findings associated with poor biosecurity implementations at this level increase the risk of having infection with the HPAI virus.
- Birds in scavenging, free range systems can have close contact with wild birds and other animals and get contaminated with the Avian Influenza virus (Ali *et al*., 2011a); also birds without a proper deworming program have a high probability to have a parasitic infestation (Horning *et al*., 2003; Figueroa *et al*., 2002); there is no demorwing control program neither in the commercial sector nor in the household sector in Egypt, Infections are mostly sub-clinical causing low production sometimes birds can present clinical signs and most rarely mortality (Horning *et al*., 2003). However, parasites can be an immunosuppressant factor for the bird making them more susceptible to suffer diseases (Horning *et al*., 2003; Figueroa *et al*., 2002) and reduce the effectiveness of the build of antibodies after vaccination (Horning *et al*., 2003).

Main challenges encountered

During the field interviews, people along the Duck Value Chain (especially live bird markets), were suspicious of the government interventions in their business. This creates an issue for the full cooperation of the producers with the consequence of denial to provide detailed information, when they were interviewed.

Lessons learned and suggestions

- The Associated Poultry Adviser (APA) program was a good opportunity to share knowledge between countries and cultures related to the poultry sector, the control and diagnosis of diseases.
- The government of Egypt has to implement regulations for duck breeding and also to have a strict control of the health status of the birds.

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Family poultry - impact on household incomes and dietary diversities in Luang Prabang Province, Lao-PDR

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Introduction

Poultry production is widespread throughout the rural uplands of Lao People's Democratic Republic (PDR) and engaged in by more than 90% of all households. Poultry are often the only livestock raised by poorer households (LDP, 2010), not all families have the time, labour or resources to manage alternative livestock species. Small poultry producers are constrained by limited access to appropriate technologies, inadequate information flow and market support services, all that is deemed necessary to sustain improved productive activities and create income generation. Along with these basic problems, outbreaks of disease pose challenges to rural farmers (Dinest *et al*., 2009). Poultry is an important component of family livelihoods in the Livestock Development Project (co-funded by ADB, STC, IFAD and JFPR) upland target area and could contribute to improved livelihood sustainability through increased incomes, food security and improved nutrition.

The intent of this paper is to identify and characterize patterns of localized poultry production systems and poultry consumption and follow with an economic analysis.

Location and characteristics of the place of field assignment

Lao PDR, located in the greater Mekong Sub-Region of South East Asia is a predominantly rural society with 85% of the population dependent on agriculture for their livelihoods. Most of these households produce food mainly for their own consumption. It is a low income/food deficit country that ranks 138 out of 187 countries in the UNDP Human Development Index (HDI, 2011). Per capita income is about US$500 (2005). Recent World Bank documents figure about 36% population live on less than US$1.5/day and 74% live on less than USD$2/day. The country has made impressive progress in economic growth, with the proportion of poor people falling from 39 per cent of the population in the mid-1990s to 27.6 per cent in 2010 (IFAD, 2012).

Lao PDR is an immensely diverse country with more than 46 official ethnic groups. These are broadly divided throughout the Mekong Corridor and the sloping/upland areas, each with a different strategic vision for its agriculture sector (GOL, 1999). This research was done in Luang Prabang, a northern upland province in the more remote districts services by poor roads and limited market access. Farming practices are mainly of a subsistence nature involving both livestock and cropping activities. Both provide different challenges and opportunities for development (Stur *et al*., 2002). The percentage of households living below the poverty line remains virtually unchanged between 1986-1998, the people having been bypassed by economic growth (GOL, 1999).

Relevance and situation of family poultry

Chickens are the main type of poultry raised in Lao PDR, with most poultry meat being produced by smallholders. In the more remote areas, poultry meat is predominantly the main source of protein and income for households. Most families raise 20 - 30 chickens, almost all of a scavenging nature, with low growth rates and limited egg production. Raising chickens is usually the task of the womenfolk (Stur *et al*., 2002). Until recently, the Khmu ethnic group has traditionally placed little importance on livestock production. Recent government initiatives and improvements in livestock management practices have encouraged them to become more actively involved in this sector.

Activities

The survey was conducted by using a semi-structured questionnaire and through focus group discussions. Ten target villages were identified involving 144 households and four groups containing 80 members. Twenty nine interviews were conducted in a non target village (control). The intent of the questionnaire was to collect data on poultry feeding and health practices, chicken production, diet and profitability. The focus group discussions included the identification of differences observed between different religious practices, dietary preferences for pregnant women and child nutrition.

The target villages are identified in two districts, randomized into five villages per district. In each village 15 interviewees were selected from the poultry group list, where no poultry group existed 15 participants were identified from other livestock production groups. The survey team comprised two/three district staff from the Livestock Development Project (two per district), one group being responsible for five villages. Myself and the translator acted as team leaders. The interviews were conducted in the local language; each interview has taken one to two hours or one to two days per village. Data collected from the survey was analyzed using the descriptive methods of the SPSS program.

Major findings

Animal species raised by responder

The most common animal raised among the ethnic group is poultry, and chickens are raised by both groups (79.53% and 93.10% of farmers in the intervention and control groups, respectively) *(Table 1)*. In average, 24.1 heads of chicken per family composed of 13.30 chicks and about 10 hens and cocks. The production of duck has increased from averagely 3.14 duck birds in control group to 12.86 birds in intervention group, which show the positive effect of poultry raising in the project intervention area.

Table 1: Animal species raised by farmers.

Species	Intervention	Control
Cow	3.98 (41.73)	7.94(65.52)
Buffalos	3.13(29.92)	2.33 (31.03)
Goat	4.65(25.20)	5.90(37.93)
Pig	4.01(60.63)	5.04(82.76)
Chicken	24.01(79.53)	26.74(93.10)
Duck	12.86 (29.13)	3.14 (24.14)

Production of chickens during the year

Smallholder poultry production is ubiquitous in Lao PDR and is a crucial income-generating opportunity for one of the poorest country in the GMS[4] (Drew Behnke *et al*., 2010). Chicken eggs are rarely consumed by farming families in most cases farmers consumed only 13.70 - 15.70 infertile eggs per year as they put a higher priority on hatching eggs to get more birds. The responders reported that one hen can averagely produce about 12 eggs and hatch only 8-9 chicks per clutch while the hatchability rate ranges from 50 to 90%, and chick mortality is very high with hen averagely raising 7.85 chicks in intervention group and 6.69 chicks in control group up to 8 weeks of age. Consequently the offtake amounts averagely to 7.43 survival old chicks per hen and 6.86 survival old chicks per hen in intervention and control groups, respectively. Outputs from village poultry in terms of weight gain and number of eggs per hen per year are often low. They are found to be 42.20 and 60 eggs with 3.36 and 2.83 clutches per year per hen in intervention and control groups respectively, but there must be minimal input in term of housing *(Picture 1)*, disease control, vaccine, management and supplementary feeding *(Picture 2)*. The mortality rate is between 70 and 80% (Jensen, 2009).

[4] Greater Mekong Subregion

Picture 1: Chicken housing in ethnic group of Lao-PDR *[Photo: T. Theara]*.

Picture 2: Uses of bamboo as feeder and drinker in ethnic group of Lao-PDR *[Photo: T. Theara]*.

Even with the low offtake, the calculation gives gross margin from January to September/October amounting to about 987,868Kip and 741,269.2Kip (123.48 USD and 92.66 USD) *(Table 2)*. The rate is 8,000Kip for one dollar. The responder can produce the gross margin per month (15.91 USD and 9.26 USD). The reason why the farmer in the project zone can get more profit than farmer who did not join the project is that during the year the main part of the chickens produced are used more for selling (19.84 heads and 2.33 heads), home consumption (11.16 heads and 7.11 heads) or given away as gifts (6 heads and 0 head). The poultry farmer can get revenue of 92.21 USD and 18.05USD in intervention and control groups, respectively.

Table 2: The productivity and economic analysis of family poultry raising.

Description	Intervention				Control			
	N	Mean	Minimum	Maximum	N	Mean	Minimum	Maximum
Egg per bird a clutch	103	12.48	2	30	26	12.07	8	21
DOC per hen a clutch	102	9.36	5	16	27	8.70	6	13
Infertile egg a clutch	99	3.08	0	9	27	3.29	0	9
8week chicks a clutch	91	7.85	2	14	26	6.86	2	12
Survival old chick per clutch(head)	91	7.43	3	14	27	6.69	1	66
Chick clutch per year for a hen (head)	68	3.26	2	10	6	2.83	2	3
Egg produced per hen for a year	86	42.20	15	72	21	36.14	20	60
Bird selling a year(head)	90	19.84	2	200	12	2.33	0	5
Bird consume a year(head)	97	11.16	1	50	17	7.11	2	31
Egg selling a year	32	1.62	0	36	9	0	0	0
Infertile egg consumed a year	57	15.70	0	200	20	13.7	0	40
Bird for gift a year(head)	74	6	0	30	17	6.94	0	30
Egg for gift a year	36	59.19	0	20	6	0	0	0
Gross margin for 8^{5}-10^{6} month (Jan-Sept) in Kip	48	987868	-945500	3745000	26	741269.2	-795000	2570000
Total of selling bird (Jan-Sept) in kip	48	737718.8	0	5400000	26	144423.1	0	1750000
Gross margin for 8^{6}-10^{7} month (Jan-Sept) in USD	48	123.48	-118.19	468.13	26	92.66	-99.38	321.25
Total of selling bird (Jan-Sept/Oct) in USD	48	92.21	0.00	675.00	26	18.05	0.00	218.75
Gross margin per month	52	15.91	-14.77	67.14	26	9.26	-9.93	32.12

Household consumption of poultry products

Table 3 demonstrates the mean number of eggs consumed and produced by household members as well as children under five years old. The mean numbers of eggs produced in the previous week was 13.88 eggs and 19.17 eggs in the intervention and control groups, respectively. The difference of both groups biased during the interview. By the way, the mean numbers of eggs consumed in the previous week were respectively 9.12 eggs and 3.92 eggs in the intervention and control groups, respectively. The numbers of eggs consumed remained low as households keep larger percentage of their produced eggs for reproduction. It is noted that more eggs were consumed in the intervention village (9.12 eggs) compared with the control village (3.92 eggs) and the similar increase of egg consumption for under five year old children with mean of 2 eggs to 4.81 eggs. The lower consumption in the control can be explained by the fact that more eggs were consumed among mothers and children. In addition, the distribution of eggs for consumption among the household members was not given special attention.

[5] For intervention group
[6] For control group

Table 3: The mean number of eggs consumed by household members.

Items	Intervention		Control	
	N	Mean	N	Mean
Number Egg produce last week	70	13.88 (1-70)	29	19.17(0-60)
Number of eggs cook for HH consumption during last week	65	9.12 (1-33)	28	3.92 (0-40)
Number of eggs cook for children < 5 years	49	4.81 (0-24)	10	2 (0-10)

Human nutrition

As illustrated in *Figure 1*, 58.7% and 66.7 % of responders in intervention and control groups, respectively reported consuming all kind of flesh meat in the last 24 hours as source of protein, of these, 13.8% and 29.2% is poultry meat. The decrease in the consumption of poultry meat in the intervention group can be explained by the fact that they put priority on eating fish with 52.3%. It is noted that rarely farmer consume eggs (22% and 20.8%) because the farmer like to keep eggs for reproduction purposes, and availability of eggs in the village is very limited. As a result, poultry keeper can consume eggs only 1.38 day and 1.24 day per week and for poultry meat 1.16 day and 1.71 day. The *Figures 1* and *2* illustrated the frequency and number of days of consuming other different food groups among the ethnic poultry raisers. The result is similar to WFP estimate that 12.8% of the households in the poor food consumption (less than or equal to 3 of 12 food groups[7]) and a further 15.6% had borderline consumption. Since the assessment was conducted during the harvest season when food availability was high and food consumption was near its peak, it is likely that most households in "borderline" and some in "adequate" food consumption categories can fall into the "poor consumption category by peak hunger season in June to August 2010 (WFP, 2009).

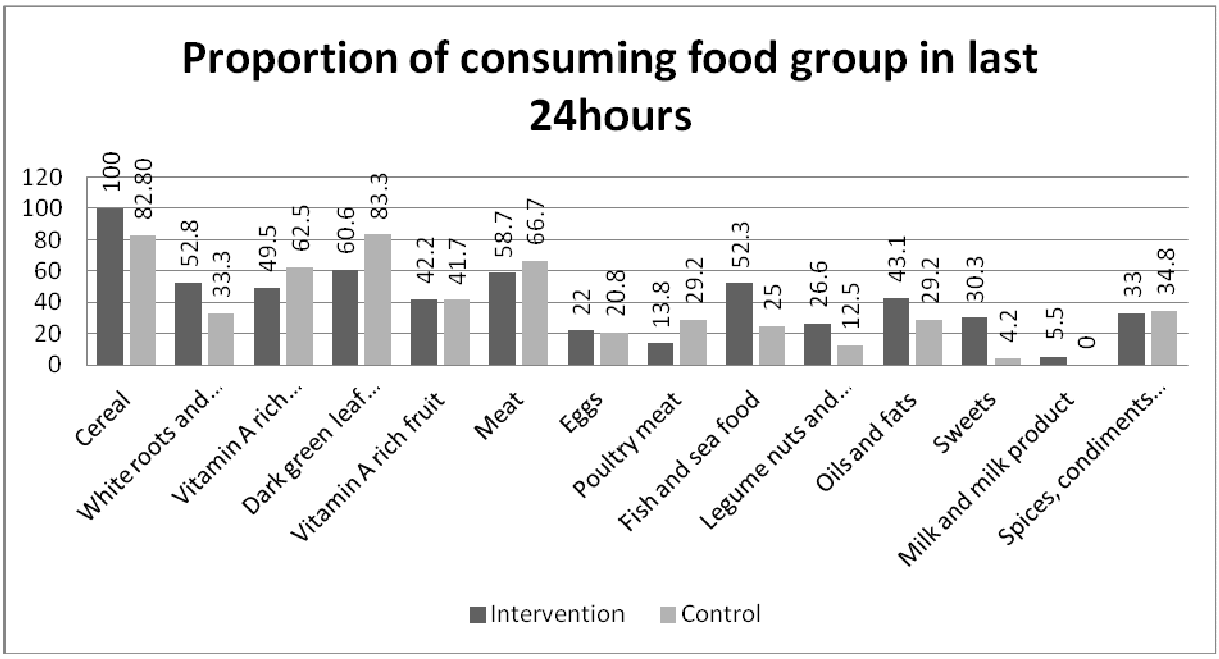

Figure 1: 24-hour recall on consumption of different food groups.

[7] 12 food group consist of cereal, white tubers and roots, vegetables, fruits, meat, eggs, fish and other seafood, legumes-nuts and seeds, milk and milk products, oils and fats, sweets, and spices-condiments and beverage.

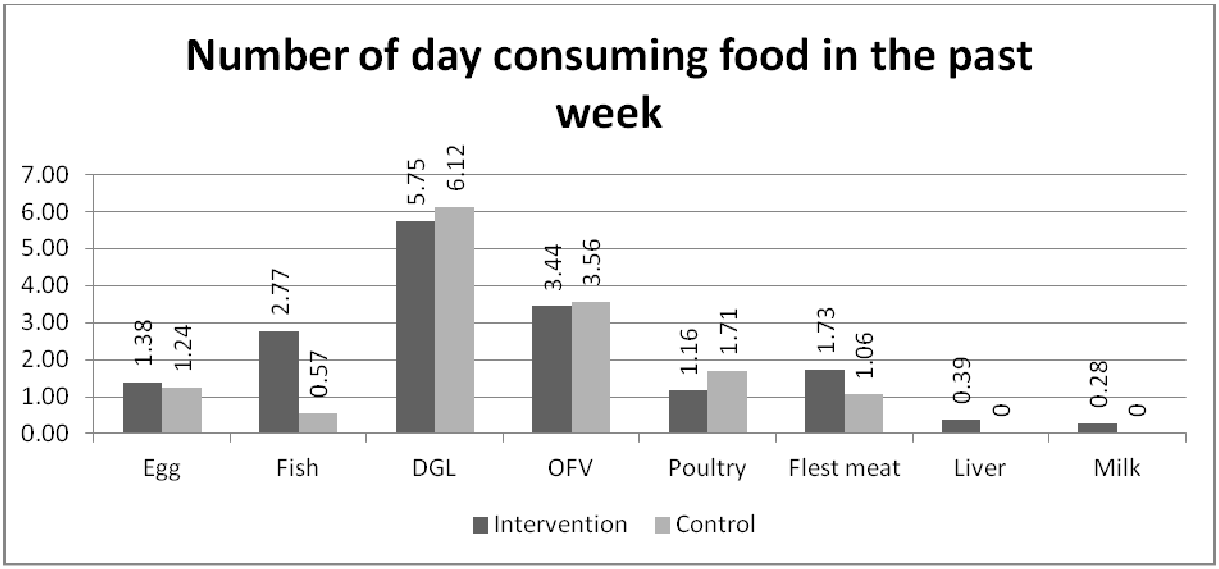

Figure 2: 7-day recall on consumption of different food groups.

Vitamin A[8] which plays a role in maintaining sight, was originally from plant-based food groups: vitamin A rich vegetables and tubers, dark green leafy vegetables and vitamin A rich fruits, and animal-based food groups of organ meat, eggs and milk and milk products. Haematia iron can help to reduce the anaemia and extracted from organ meat, flesh meat and fish. Data from both groups found less percentage of responders consuming animal source vitamin A intake in the last 24 hours (28% and 34.8% in intervention and control groups, respectively). However, research showed a considerable number of farmers get vitamin A through plant (87.9% and 91.7% in intervention and control groups, respectively) like mango, papaya, pumpkin, DGL[9] etc. Furthermore, the findings from this survey found that the proportion of HH's haematia iron-rich food intake was impressively high (82.2% and 75% in intervention and control groups, respectively) because most of them had consumed organ meat, flesh meat and fish yesterday.

Main challenges encountered

Low productivity and disease outbreak

Mortality rates from Fowl Cholera and Newcastle disease are exceptionally high under upland conditions even the project recently irregularly provide the free vaccine to the farmer. The sustained low growth and low fertility rate combined with disease outbreak result in disappointing production rate. The overall constraint to poultry productivity include endemic and epidemic diseases; smallholder limited knowledge of simple husbandry practices including appropriate sanitary practices; lack of understanding of the concept of balance diet; limited understanding of the need for chicken houses and nests; and limited knowledge of the principles of flock management among the ethnic group in Lao PDR.

Distribution of vaccines

The farmers relied on the supply of vaccines from the district staff while continued dependency from the project. It appeared that project has no existing strategy to ensure sustainable vaccine provision. A similar situation is found in the non targeted or remote villages where the inexistence of vaccines discourages chicken production and marketing of chicken products to the urban areas.

Planning of research

The research has good coordination from the project. But it appears that the research study does not respond to the need of the project as the project focus on socio-economic has impact on the livelihood of beneficiaries, which is slightly different to my actual research. By the way, the assistance from the project was still limited as APA was sent to

[8] Vitamin A is used in this section for simplicity. It indicates foods containing retinol or retinol pre-cursor carotenoids.
[9] Dark green leafy vegetables

work with the provincial government staff where the plan has changed many times. This reduced the field work of the research. Fortunately, the assigned project staff number has doubled in doing interviews in order to finish the data collection on time.

Lessons learned and suggestions

From the field assignment, it was learnt

1. Appropriate technology transfer for all animals (goats, pigs, ruminants) was adapted to the tropical climate, and there was a process of revolving fund.
2. There was assistance from an international consultant in training and project field visit including understanding consultancy and project report.
3. Opportunity was also taken to learn and understand the functioning mechanism of FAO, IFAD.
4. The overall aim of LDP is to contribute to government initiative in poverty reduction through smallholder livestock development in the northern region. Putting priority on technologies transfer to the farmer can get success upon additional criteria based on understanding of the social conditions, the capacity of district, provincial and national extension staff including good system of coordination and organization from national level to village level and especially from the district level to farmer level.

APA program needs to be sustained if APA knowledge or new technologies introduced during the training in Rome could apply directly in the assigned project area. Furthermore, APA should be engaged with FAO or IFAD in their own countries.

Acknowledgements

This research project would not have been possible without the support of many people. I wish to express my gratitude to Dr. Olaf Thieme, FAO Livestock Development Officer, for offering many documents related to my previous research in ASEAN country, facilitating and supervising the assignment. Special thanks go also to Dr. Syseng Khounsy, Ms. Stefanie Dina, Mr. Antonio Rota, Mr. Gavin Varney, and LDP staff, without whose assistance and facilitation this research study would not have been successful.

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Impact assessment of a training program on family poultry production for primary school children in Morogoro, Tanzania

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Introduction

Traditional chicken keeping involving local and uncharacterized chicken ecotypes constitutes a greater percentage of all chickens kept in developing countries, especially in Africa and Asia. These chickens are synonymously referred as indigenous local chickens, free-range chickens, village chickens or rural chickens as compared to commercial chickens involving exotic layer and broiler breeds. In the current study, the term 'free-range chicken' will be used for such birds. They constitute up to 80% of the total poultry population in Africa (Guèye, 1998; Mlozi *et al*., 2003) and are characterize by small body size, slow growth rate, low egg production and late maturity. The Food and Agriculture Organization of the United Nations (FAO) has classified poultry production systems in four categories (Sectors 1, 2, 3 & 4) based on the level of integration of operations, the marketing system and the level of biosecurity. In a large number of low-income countries, backyard/household production (Sector 4) is the largest system of poultry production and a critical source of income and nutrition for poor households (Ahuja and Sen, 2007).

In various studies, diseases have been identified as the major constraint to the poultry industry (Minga *et al*., 1989; Awan *et al*., 1994; Dinka *et al*., 2010). It has also been shown that a high prevalence of other factors like helminthoses, ectoparasites, low nutritional status and predation contribute to mortalities (Permin *et al*., 1997; Mwalusanya, 1998; Magwisha *et al*., 2002).

Over the last three years, the UC Davis School of Veterinary Medicine through the Poultry Health World Development (PHWD) project has implemented a regional program, partnering with Sokoine University of Agriculture and other academic research institutions, to implement a university-based model of training and field research projects to prevent avian flu, to improve local chicken production in some selected villages in Morogoro Tanzania. Usually women and children are involved on taking care of poultry (Muchadeyi *et al*., 2004). There have been some efforts from governmental and non-governmental initiatives to train adults, but mostly targeting men who practically are not directly involved with poultry production. Although training activities have appeared to promote poultry production in Africa (Knueppel *et al.*, 2009), especially of free-range chickens, little effort has, however, been directed to train school children and young adults, who actually are the ones involved in day-to-day care of household poultry. It was on this insight that PHWD project proposed to establish its program of delivering knowledge to school children with the goal of improving biosecurity and productivity on these small farms, and offering greater protection to the flocks as well as the families that raise them. In addition to the other activities as pointed before, the project prepared a program to train primary school children on basic knowledge in chicken production to be implemented from May 2010 to August 2011. Four primary schools were selected from which respective teachers were trained on chicken production matters by animal production scientists and veterinarians. The chicken production subject was then incorporated into a subject known as vocational studies. It was therefore from this point pupils took the subject as a routine in their timetable, involving both theoretical teaching and practical aspects of chicken keeping. Imparting knowledge of keeping chicken to school children is considered to be an important step in improving productivity for livelihood improvement.

This study was done to assess whether the training project had a positive impact on knowledge transfer to participating pupils and to their society at large.

Methodology

Selection of schools and participants

The study was conducted at Mzumbe ward in Morogoro region in Tanzania (8°00'S 37°00'E / 8°S 37°E). There are ten primary schools in the ward. Four schools out of ten are conducting the training program on local chicken keeping as implemented by the PHWD project. From the four project schools, two schools were selected randomly by writing

the name of a school name on a piece of paper then allowing uninformed person to pick out two pieces of paper out of four. Two schools not involved with the project were selected by considering geographic closeness to the schools with the program.

It was decided that all pupils in standard six classes would participate in the evaluation process. The pupils were assessed by having to answer specific questions prepared in question scripts. The questions asked aimed at testing pupils on general knowledge on poultry, husbandry activities including housing, feeding, diseases control and biosecurity. Perusal of question scripts was done by the school teachers to ensure they were directly related to the knowledge provided during the training. One hundred (100) student answer scripts were randomly selected (25 from each school) while also ensuring gender balance as shown in *Table 1*.

Table 1: Summary of schools and pupils involved in the evaluation.

Name of school	Number of pupils involved		Status	Number of scripts chose		Date of the evaluation
	Boys	Girls		Boys	Girls	
Masanze	22	25	All trained	12	13	04th/ 10 /2011
Lubungo	18	16	All trained	13	12	11th/ 10 /2011
Mafuru	18	20	Not trained	12	13	18th/ 10 /2011
Mwenge	21	19	Not trained	13	12	25th/ 10 /2011

Forty parents were randomly selected for interviews by choosing 10 names of their children from each of the four schools to be interviewed.

Meeting with project stakeholders

Stakeholders of the PHWD project include project leaders, the ward executive officer, the village leaders and teachers in the schools involved.

Project leaders

Before commencing the study, a meeting was conducted with the PHWD project leaders. In this meeting, the project coordinator in Tanzania, who is also the chief project researcher, and an assistant project researcher were involved. The meeting also invited the ward executive officer the government representative to the project. The meeting was done once permission was granted to carry the study. The aim of the meeting was to have a brief overview of the activities of the project, goals achieved and challenges encountered.

School teachers

Head teachers and respective study subject teachers from all schools selected for the study were called for an overview discussion on the PHWD-project activities in schools. The methodology and impact of the training program to the pupils and parents were discussed. Teachers were also asked for their supervisory support during this assessment procedure and their inputs were sought on the translation and moderation of interview questions to be used by pupils.

Interview of parents

In each school the selected parents were invited to school compound to receive a brief explanation on the planned evaluation and scheduling the time of visiting their households for field assessment. Forty parents were randomly selected from the parents of the pupils involved in this assessment study. Twenty parents had their children in schools with training program and the other 20 had children in schools with no training program. The questions aimed at assessing whether the knowledge provided to children was assimilated to their parents. Questionnaires were completed during the household visits and on average two respondents were interviewed during each visiting day.

Knowledge assessment of the school children

All standard six class pupils (159 in total from four schools as in *Table 1*) were provided with scripts of questions and were asked to answer independently. The questions were based on general knowledge on chickens, chicken management, health, welfare and biosecurity issues. The questions were made and moderated and were presented in Kiswahili language. Pupils were required to answer the questions in 30 minutes.

Practical skills were assessed by asking the children to demonstrate procedures to prepare nests, feeders and drinkers using locally available materials and draw pictures that could represent what they explained. Pupils demonstrated the procedures for cleaning chicken premises according to the way they learn and practise to school. They were asked to name different structures in the chicken houses and their uses. The questions were asked verbally from me and their teachers, and pupils answered by speaking the answers loudly to the whole group.

Feedback meeting to project stakeholders

Final meetings were carried out with all project stakeholders for receiving and discussing the resulted findings of the study and to assess the project impact and progress to the community it belongs. These were done at the end after data collection analysis.

Results and discussion

Progress review from the project stakeholders

It was revealed during evaluation of this project that the training to pupils was done as a method of knowledge transfer on chicken keeping to the wider society. Project reports revealed the program has stimulated some villagers to search for a training course, whereby in the years 2010 to 2011, eight women and six men received training from these primary school training centres in addition to more than 150 pupils in all schools involved. *Table 2* shows the total number of students trained in the two schools used for evaluation (standard five and six). Exact number of pupils in the other two schools involved was not available at once.

Table 2: Showing participants trained on local chicken keeping from two schools with the project selected for evaluation in a year 2010-2011.

Trainees	Girls	Boys	Women	Men
Masanze Primary School	49	44	7	4
Lubungo Primary School	32	28	1	2

Assessment of parents on the general knowledge on poultry management and health

It was observed that the majority of parents are keeping local chickens at their home. Only 4 households were not keeping any kind of poultry species and the others are keeping local chickens and a few had other poultry species like *Muscovy* ducks and pigeons. Local chickens are kept mainly for family needs, including selling to buy requirements for children school and for home consumption.

During the evaluation, participants were required to mention major threats to their activities of keeping chickens. Diseases were mentioned by all (100%) respondents while predation was mentioned by 68% of the responses and theft appeared in the 32% of the responses. Level of exposure to vaccination of the major diseases in the area varied between the parents and to some extent depended on the fact of having child/children in a school with training program. Among the 40 parents, 29 and 9 of them had at least heard about Newcastle disease (ND) and fowl pox vaccinations respectively. In the group of parents who had heard about ND vaccination, 18 (62%) had children in the schools with the training program. In addition of just having ideas about the ND vaccination, only 6 parents were found to have knowledge on the proper vaccination regime. Not one among the 9 parents who had heard about fowl pox vaccination could explain the vaccination regime.

Feedback from parents on the impact of family poultry through school project

It was found that 13 out of 20 pupils from schools with the training whose parents were interviewed have shared the knowledge with their parents from school through discussions. Parents were also asked to comment whether their children participate in activities concerning chicken management and it was found that the majority of them were participating. However, among the children reported to work in chicken management activities, 60% were boys and the rest 40% were girls. This finding coincides with the results of another study carried out in Zimbabwe by Muchadeyi *et al*. (2004) which showed that boys had more participation in chicken keeping activities than girls. Boys were mentioned to carry out almost all the activities including making chicken shelters while girls participate more in cleaning and feeding activities.

Assessment of pupils' knowledge concerning chickens

Scripts from the pupils were marked and scores were given depending on how correct one answered the given questions. The questionnaire was divided into three parts and for each part marks were distributed between 0 to 10, with 0 mark given to ones who could not answer any question correctly, and 10 to ones who answered all questions correctly. Part I of the questionnaire was about general knowledge on poultry, part II was about management and part III was about animal welfare and biosecurity issues. In order to facilitate analysis the range of scores was divided into three categories, where from 4-7 marks; it was considered to be average score and above which or below which was considered above average and below average respectively.

In general view, it was observed that pupils in the schools with training performed better than the ones from schools with no training. Supported by the data obtained, as can be seen in *Figure 1*, the overall proportion of pupils falling under the average and above average performance is higher in schools with training as compared to schools without training, especially in the categories of "management and health", and "welfare and biosecurity". In the category of general knowledge of poultry, 7% and 93% of the pupils in schools with training fell under below average and average scores respectively, as compared to the respective 22% and 78% for the pupils in the schools without training. This can approximately mean that the ratio of below average to average performance in schools with training is 1:13 as compared to 1:4 in schools without training.

Variation was also observed on the category of poultry health and management where 18% of pupils from schools without project performed under average score, which is nine times the 2% of the same performance in the pupils from schools with training. The percentages of pupils with average scores in this category for schools with and without training (75% and 80% respectively) were almost equal. However, 23% of pupils with above average score which is more than eleven times the 2% of pupils from schools without training with the same performance was observed.

Again performance in the category of animal welfare and biosecurity issues observed better results from pupils from schools with training (80% falling under above average score) as compared to schools with no training where majority (80%) had average score. In this category it was also observed a nine times number of pupils with below average score (18% versus 2%) from schools without training as compared to pupils from schools with training.

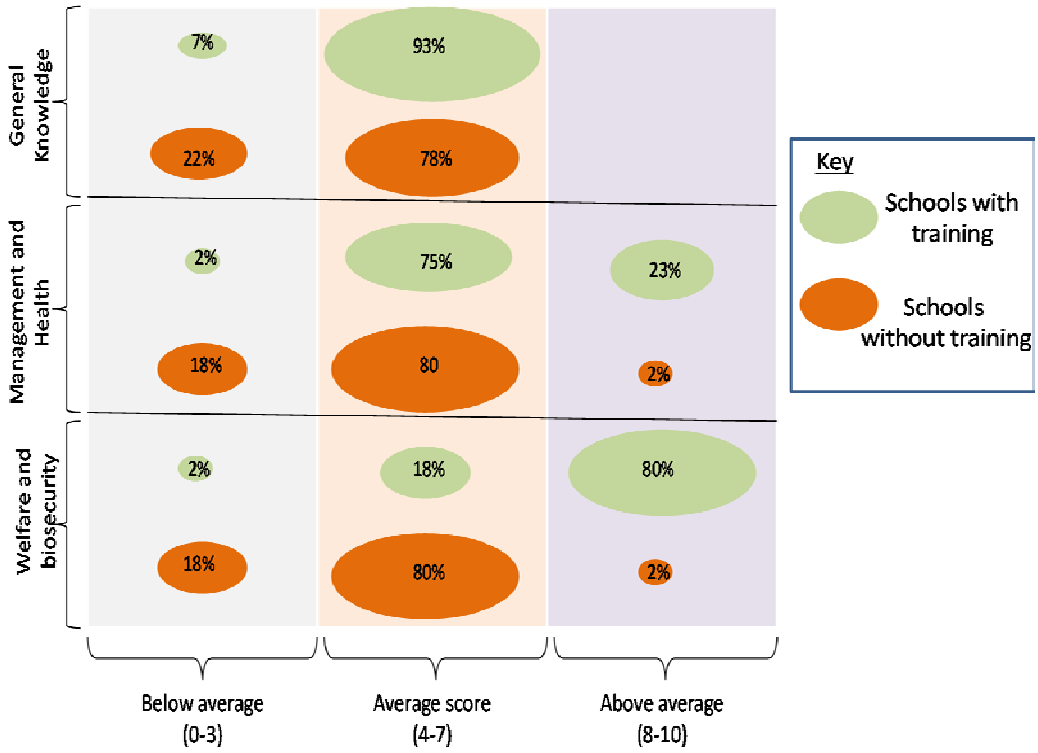

Figure 1: Assessment results of pupil's knowledge on chicken keeping.

The overall better performance of the pupils in schools with a training program clearly indicates a positive impact on family poultry keeping resulted from a training program. With one year of training, this assessment finds a change in the level of knowledge of pupils about poultry management. Practically a positive difference was also observed between trained pupils and the ones not trained on poultry production. Although the methodology did not permit recording performance as scores, it was observed a better demonstration from trained pupils in terms of eggs inspection and storage, identification of poultry house structures and units, poultry house cleaning among different areas they were required to demonstrate.

Positive impacts of training family poultry to school children were also expressed upon visits done to the households of the pupils. The majority of households are keeping poultry, especially chickens. However, there were some observable differences in the frequency of application of better management tolls in the households of trained children as compared to the ones not trained. Egg storage, selection of eggs for incubation, preparation of incubation sites, feeding, housing, cleanliness, were observed to be done more carefully in households of trained children as compared to the households of the ones not trained.

Pictures 1- 8 below were taken during the evaluation of children and parents concerning the impact of training school children on family poultry production.

Picture 1: Two classes (standard five and six) of a single school before standard six children to be examined *[Photo: F. Kajuna]*.

Picture 2: During the examination of children *[Photo: F. Kajuna]*.

Picture 3: After the children were examined, they were given some biscuits and juice *[Photo: F. Kajuna]*.

Picture 4: Practical examination of children in the chicken shelter. Their teacher asking them about some shelter cleaning procedures *[Photo: F. Kajuna]*.

Picture 5: One of the parents showing us how her son impressed her when he built his own chicken shelter *[Photo: F. Kajuna]*.

Picture 6: This boy also convinced his parents to keep chicken,s he told them that before they get money for building a chicken shelter, the chickens will be sleeping in the kitchen. Behind him is their kitchen house *[Photo: F. Kajuna]*.

Picture 7: Inside the kitchen house, the boy prepared the chicken sleeping place *[Photo: F. Kajuna]*.

Picture 8: Here are some parents of children with interest in keeping local chickens. They asked me to have at least a short discussion concerning chicken management and disease control *[Photo: F. Kajuna]*.

In the course of observation and assessment, this study found a more active participation of boys as compared to girls. This was mentioned by parents, observed during practical assessment sessions but was also reflected by a better performance of boys in the questionnaires. It is however different when compared to the adults, where you find that

women are more actively involved with poultry management and caring as compared to men (Okitoi *et al*., 2007). This implies that one should not underestimate the value of educating girls just because they are less active in poultry management in their young age. Rather, educating girls about improved family poultry keeping is a way of knowledge dissemination to the society currently and the preparation of future skilled women.

Conclusions and recommendations

This assessment study found that training school pupils has a positive impact on upgrading their knowledge on poultry management. The study demonstrated that imparting knowledge to the young children can act as a media for transferring skills to the society. The study also indicates that there is an opportunity to provide additional vocational skills to the primary school curriculum. From the findings of this study, it is worthy to predict improvement in the productivity of local chickens under the care of the individuals and communities covered by this program.

The findings of this study suggest that it is a training program worthy of expansion to other schools so as to have a wider impact. It also demonstrated the importance of involving children in community capacity building. Although this assessment involved only a small number of schools, the findings of this study would be beneficial to a range of institutes, organizations, government and other stakeholders. Extra efforts should also be employed to present the findings to the government, being the major role player in facilitating an expanded training program. Funding institutes and other organisations, including FAO, who are stakeholders in human development at the grassroots or household level should facilitate more detailed impact assessment studies.

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Documentation of good practices for family poultry development in Swaziland

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Introduction

Good Practices (GPs) go hand-in-hand with developing an understanding of family poultry development, building capacity in documentation and the use of simple tools to sensitize actors, build coalitions and influence policy formulation and implementation (SA-PPLPP, 2009). GPs of family poultry are those activities which are followed by farmers or organizations or producers will positively impact on their capacity to produce more in order to achieve food security and increase their opportunity for income generation. GPs are generally characterized by being socially and economically acceptable and technically sound. A Good Practice is a unique mixture of technologies and institutional set up that has remarkable and sustainable impact on famers' livelihoods (Pica-Ciamarra and Dhawan, 2010). There are many different GPs on family poultry which have been identified and are followed by producers in different development countries such as Bangladesh, India and Bhutan. In this context, the APA assigned to Swaziland intends to identify the relevant GPs of family poultry and properly document them in order to disseminate the practices to other rural poultry development projects as well as other countries.

Location and characteristics of the place of field assignment

The geographical coordinates of The Kingdom Swaziland are 26 30^0 S and 31 30^0 E. The country is completely landlocked by the Republic of South Africa and Mozambique. The total surface area is 17 000 km^2 and the country is divided in 3 ecological zones, the Highveld, the Middleveld and the Lowveld. The Highveld is a rainy area which receives between 800-1000 mm annually while the Lowveld is drought prone with annual rainfall between 200-400 mm per year and the Middleveld is in-between the two .The agriculture sector contribution to GDP is 12 percent, and the sector contribution to exports represents 76 percent of the total (FAO, 2007). About 68 percent of the population of Swaziland lives below the poverty line and the Lowveld has the highest density of the poor. In effort to reduce poverty, the government of Swaziland in collaboration with IFAD established the Lower Usuthu Small Scale Irrigation Project (LUSIP). LUSIP is a poverty alleviation initiative in the South-Eastern Lowveld of Swaziland. This area is drought prone, and more than 70 % of the population depends on food aid distributed by the World Food Program (Thwala, 2010). The main goal of LUSIP is to improve standard of living of the people in the project area, who are among the poorest in Swaziland. LUSIP was planned based on converting 6500 ha of under dry land farming into irrigation blocks. Besides, LUSIP also promotes livestock production, beef, dairy, piggery, family poultry etc. In recent years, family poultry has shown a steady growth, this is due to its short reproductive cycle thus it easily addresses the issues of food security and income generation. Different donor-funded projects (IFAD. WFP, FAO, etc) work in Swaziland for the improvement of household food security in a sustainable and integrated way to address the challenge of the vulnerable people.

Relevance and situation of family poultry

Poultry is the most widely owned animals among households of rural Swaziland. A total of 92.5 percent households keep poultry, as compared to 50 percent, 46 percent and 16 percent which raise cattle, goats and pigs, respectively (IFAD, 2001). About 90% of locally produced eggs come from the large commercial sector, mainly from two large farms, namely Eagles Nest in Malkerns and Usuthu Poultry in Mzimpofu. About 70% of households keep indigenous poultry comprising mainly of Swazi chickens, ducks, geese and turkeys. The number of the chickens in the country can be reasonably estimated at 1.8 million (Vilakati, 2008). The main objective for keeping indigenous chickens is to enhance food security, home consumption and local sale for small household income and socio-cultural purposes. The Ministry of Agriculture (MOA) in conjunction with IFAD, FAO and INGOs (like World Vision) have developed family poultry development program with the use of semi-scavenging system to encourage rural households

for increasing eggs and meat production from their existing stocks by improving husbandry practices.

Family Poultry Production system in Swaziland is mainly three types in Swaziland: 1) semi-scavenging system: small flocks of native or improved birds that are reared partly in free-range in particular time in a day and partly managed intensively during the rest of the time; 2) scavenging system: small flocks of native birds allowed for full scavenge without feed supplementation; 3) Small-scale intensive system: Farmers usually rear broilers under small-scale intensive system (100-500 birds per flock).

Activities done

To identify Good Practices (GPs) of family poultry, a series of activities have been carried out – such as personal interviews of project personnel and government officers, group discussions, field visits and a workshop. Participants of the workshop and other events have described the different practices of family poultry of Swaziland. The use of herbal plants for preventing diseases, housing, feeding, breeding, separation of chicks from their mother hens after hatching and indigenous poultry rearing using the semi-scavenging system, etc, practices have been highlighted. The description of Practices is given below:

Use of herbal plants

Farmers use different herbal plants for the prevention of poultry diseases. *Aloe* sp. is widely used as an herbal plant by the farmers. It is a traditional and popular practice in Swaziland.

Housing for chickens

Farmers who are keeping semi-scavenging birds have constructed poultry sheds and fences into the household yards. Mother hens, chicks and pullets can spend the night and come out at the morning from the sheds. Baby chicks stay in confinement during all the day. LUSIP assists farmers to build poultry sheds due to protect chickens against harsh weather conditions and also to protect chicks against predators.

Separated chicks from mother hens

Broody hens hatched eggs and take care of their chicks. Farmers separated chicks from hens within 0-30 days and provide warm temperature. Separate chicks from hens are the traditional practices of farmers. LUSIP promotes the practices to separate chicks from hens after hatching.

Supply of supplementary feeds

Farmers do not provide enough feeds in scavenging poultry, which indicates low productivity. The LUSIP intervention is to allow chickens to semi-scavenge, and to provide 30-40 gram of yellow crushed maize for each bird as a supplementation to increase productivity.

Natural breeding

Maintain a cock to hen ratio of 1:10 for producing fertile eggs. For controlling inbreeding, farmers should introduce new cocks from distant villages every 12 months. Although it is a recommended practice, most farmers do not follow it. Therefore LUSIP assist the farmer to promote this practice.

Semi-scavenging system

Indigenous chickens are reared by farmers under semi-scavenging system. This is a small flock of native birds that are reared under free range management for some of the days and intensively managed for the rest of the time. Selected farmers, with support from different projects have followed the semi-scavenging system in Swaziland. In this system farmers usually follow combines of whole existing above-mentioned traditional or improved practices for getting more benefit from family poultry.

Top GPs are identified by a scoring system. After identification of GPs, they have been verified and validated through discussions with technical personnel as well as farmers. Primary information is collected from the field visits through group discussions and personal interviews according to check list. Secondary information was collected from different reports and journals. The semi-scavenging system which was a combination of all these practices had been

found as most important GPs in Swaziland. During the field visits for the APA assignment and interactions among different stakeholders of the poultry sector, the whole family poultry production system became known to a large audience. Therefore, the APA decided to describe the family poultry production system along with GPs, especially with emphasis on semi-scavenging system with those practices in Swaziland.

Beside of this special assignment, APA also attends several field trainings and conducted the session of good practices for family poultry development especially feeding and diseases management; artificial incubation and brooding system for development of family poultry in Swaziland.

Major findings

- In the study area, seventy eight per cent of the women are involved in different activities of family poultry rearing such as feeding, setting-up to hatching eggs, providing care of broody hens and chicks, slaughtering of chickens and collecting manure.
- A number of adapted GPs have been developed by local poultry producers to minimize the risks and increase productivity. They range from the construction of appropriate sheltering facilities, supplementation of free-ranging feeding, utilization of local herbs for improving birds' capacity to resist to common diseases and brooding techniques.
- The adoption of the package of abovementioned GPs resulted in an increased net income per hen per year from E150 to E600. The number of clutches per year and the average number of eggs laid per hen have increased from 3 to 5 and from 40 to 60 respectively.

Box 1: A case study of GPs implementation

Elias Smantji Mamba, a poultry farmer of LUSIP keeping semi-scavenging birds. He is rearing indigenous hens and cocks to produce fertile eggs and baby chicks all the year round. After brooding, he rears the chicks for 7-8 months under the semi-scavenging system. A total of 6 broody hens are now hatching the eggs and 5 chickens are laying eggs. A total of 37 chicks are being kept in the brooding room at a proper temperature, with chicks removed from hens within 5-7 days of hatching and reared intensively for one month. A total of 94 young chickens (four-five months of age) are being reared in the semi-scavenging system in a fenced area of the household yard in the fencing, with 7.83 square meters of land for each young bird.

Mr.Mamba provides supplementary feed (40-50 gram yellow crushed maize /bird/day) and green grass to his chickens *(Picture 1)*. The Newcastle disease (ND) vaccine has been given to chickens once time in a year by oral administration. The herbal plant, *Aloe vera*, is widely used for controlling diseases. Two fresh leaves (each leaf length 8-10 cm, width 4-5 cm) are crushed and put in water (2 liters) and then provided to the chickens. He can earn E340-350 each month from his farm. He can also consume near about one chicken and 10-12 eggs each month from the farm.

Mr. Mamba has separated his farm into reproductive and productive sites. Breeding stock (hens and cocks) is reared at the reproductive site. At this site hens lay and hatch eggs in the nest *(Picture 2)*. After hatching, day-old chicks are transferred to the productive site under brooding room and reared there for one month with proper temperature control and feeding. After reaching one month of age, the chicks are transferred to another shed and reared until marketed at 7-8 months old.

Herbal methods are used to prevent diseases in birds in scavenging and semi-scavenging poultry flocks in Swaziland, and *Aloe* is the most popular herbal medicine.

Picture 1: Mr. Mamba provides green grass to chickens *[Photo: S.M.Rajiur Rahman]*.

Picture 2: Set up brooding nest on upper place in the reproductive site of household yard *[Photo: S.M.Rajiur Rahman]*.

Box 2. Good Practice: Use of Aloe spp.

Good Practices are generally characterized by being socially and economically acceptable and technically sound. *Aloe* spp. is not distributed to chickens to prevent any specific diseases rather than it is used for all types of disease prevention. Farmer practices, experiences of field visits and information of secondary sources showed that herbal plant could control poultry diseases. Local knowledge for indigenous poultry health management should be promoted to minimize veterinary costs. Local herbal plants like *Aloe* spp. could be widely used for the prevention of poultry diseases. More research should be done in this field for the benefit of family poultry producers. It is one of the good practices in Swaziland for family poultry producers. Besides the use of *Aloe* spp., a vaccination program must be ensured against certain major diseases.

Good practice indicates that addition of some snuff powder (dried *Aloe* spp. and tobacco leaves) to water has been shown to be a powerful immunization of poultry flocks. Good practice also indicates that adding of one or more fresh leaves of *Aloe* spp. to water can prevent or treat specific diseases. It is necessary to test more extensively the efficacy of the various concoctions used by farmers treat Newcastle disease (ND). Although all traditional remedies currently used are not likely to be effective, it is reasonable to expect that some local therapies work effectively (Guèye, 2002). Scientists have discovered over 150 nutritional ingredients in *Aloe vera*. They all work together in a synergistic way to create healing and health giving benefits.

Box 3. Good Practice: Separation of hens from day-old chicks

The Good Practices show that an appropriate extension process, which leads to small changes in husbandry practices, can enhance the contribution of household production for improvement of livelihoods. Efficient husbandry practices in small-scale farming are typically context-specific, based on local resource endowment and knowledge and, on occasion, build on traditional practices.

Farmers are separating baby chicks from the hens after hatching. They keep these chicks for one month in a box with ash and dry grass in a warm place at the proper temperature *(Picture 3)*. This is another good practice in Swaziland for family poultry producers. As a result of this intervention, the number of clutches for each hen increases from 3 to 5 per year, and the number of eggs produced increases to 60-90 each year instead of 30-45. Suitable temperature must be provided for the chicks, especially in the first 2 weeks, where half of the chicks were lost in Benin (Dakpogan *et al*., 2011). Therefore, to get more benefit out of this practice, brooding with appropriate temperature must be followed by family poultry producers in Swaziland.

Returns for a one year investment in one single hen in the semi-scavenging system are handsome. The return on investment for this one bird is about 70 per cent and it provided as annual net income of about E611. A commercial broiler under small-scale intensive system can generate gross margin E7 per bird for each batch (35 days) in Swaziland.

Good Practices are associated with definite improvements in reducing chick mortality, and marketing ages and increased number of chickens (meat) and egg consumption per month are often due to improved management practices like: separation of hens from day-old chicks, provision of warm places to day-old chicks (brooding), preparation of night shelter, provision of supplementary feed, use of *Aloe* spp. for remedial treatment of poultry diseases and provision of marketing support.

Picture 3: Chicks are kept on warm place after separation from hens *[Photo: S.M.Rajiur Rahman]*.

Main challenges

Without efficient vaccination program (as well as whole management practices of poultry rearing); all GPs are fallen in challenge. Due to outbreaks of ND, about 70 % of chicks are lost. The only way to avert such losses to farmers would be to incorporate efficient ND vaccination program into the Project interventions. Even some farmers reported that, after providing ND vaccine by oral administration to chicks, some of them do not survive. They want to introduce the vaccine by the method of eye drop or subcutaneous. Therefore more investigations should be made to find out the actual situation in this regards.

Lessons learned and suggestions

Project Related

Provision of night shelter and supplementary feed, the use of *Aloe* spp. for increasing birds' capacity to resist to common diseases, and separation of hens from baby chicks can be promoted as good practices for the family poultry

production system in Swaziland. The semi-scavenging system which combines the use of those practices has been found as most important Good Practice (GP) for the family poultry production system in Swaziland.

Training on poultry rearing and management, supply of the necessary start-up inputs (including housing structures and equipment), and help with marketing linkages can all be strengthened to promote family poultry production for year-round income and improved food security.

For development of family poultry production in Swaziland following recommendations should be followed:

- A homogenous training curriculum and modules should be developed and adopted to the national label.
- The follow-up and monitoring of field activities should be strengthened. Leading farmers might be identified and trained for providing technical support (viz: vaccination, marketing linkage etc) to farm households. It is recommended that a small fund be created at poultry group level for purchasing vaccines and other medicines. Members of the group should consider paying a small fee to vaccinators.
- A register book should be maintained on all farms for keeping technical and financial records. A recommended format should be introduced for this purpose.
- To minimize the mortality of chicks, brooding technology and vaccination programs should be ensured for family poultry producers. After removing the chicks from the hens, they should be kept in a warm location and provided with appropriate feeding for one month (the brooding period). After this initial period, cockerels and pullets might be distributed or sold to other poultry farmers for the next production phase. In Swaziland, average market price of one month old cockerels and pullets is around E 20-25.
- Supplementary feed should be ensured for chickens every day. The formula for this feed should include broken maize, sorghum, blood meal, bone meal, termites, grass and leguminous leaves and seeds etc.
- Exchange visits or cross visits for farmer to farmer contacts might be incorporated into project activities for rapid expansion of the semi-scavenging family poultry system.

The APA program related

- From the beginning of the assignment in the field office, orientation program is necessary for APA, as APA prepared the minds in particular situation to mitigate some of the field challenges.
- For sustainability of APA program, all APAs activities should come to under one umbrella (like INFPD) and involve them for a certain period (at list two years) in family poultry activities in home/abroad under IFAD or FAO project with good remuneration. INFPD/FAO should develop a mechanism to monitor APAs activities closely and disseminate the findings to other projects with global interest to mitigate poverty and food insecurity.

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Étude sur la filière avicole en Mauritanie: analyse de la situation de l'aviculture familiale

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Introduction

L'élevage est la seconde ressource de l'économie de la Mauritanie après la pêche avec une contribution estimée à 14,3% du P.I.B et prés de 80% de la valeur ajoutée du secteur rural (FAO, 2002). Le cheptel est estimé à 1,3 million de camelins, 1,4 million de bovins, près de 14 millions de petits ruminants et 3.400.000 volailles dont 2 millions en aviculture familiale. L'aviculture familiale demeure intéressante du fait de ses potentiels importants d'amélioration (FAO, 2002).

Il a été rapporté que les importations mauritaniennes de produits avicoles sont égales et surpassent même celles des pays voisins comme le Sénégal et la Côte d'Ivoire, malgré le fait que la population de la Mauritanie soit très inférieure à celle de ces pays (près de 4 fois inférieure à celle du Sénégal et près de 6 fois à celle de la Côte d'Ivoire) (FAO, 2009). Il semble ainsi, que d'ici l'horizon 2015, la production locale ne pourra que difficilement couvrir une demande croissante. Dans ce contexte, le développement des productions avicoles doit répondre à la fois aux exigences d'une augmentation de la productivité pour satisfaire une demande croissante en viande blanche et au maintien de l'activité en zone rurale afin de lutter contre l'exode rural et la pauvreté.

Le Programme de Lutte contre la Pauvreté Rurale par l'Appui aux Filières (ProLPRAF) financé par le FIDA s'intéresse à développer 7 filières (aviculture, maraîchage, peaux et cuirs, produits forestiers non ligneux, lait, dattes, viandes rouges) au niveau des zones rurales arides de la Mauritanie. En ce qui concerne la filière avicole, l'objectif visé par le projet consiste à développer une filière avicole axée sur l'amélioration de la productivité en aviculture familiale et le développement de l'aviculture commerciale afin d'assurer une économie de devises par substitution des importations par des produits avicoles locaux.

Notre étude réalisée dans ce cadre consistait d'une part à appuyer les activités relatives à l'aviculture par l'appui-conseil, et d'autre part à faire l'état des lieux de l'aviculture familiale en vue d'appréhender des stratégies à partir desquelles cette aviculture pourrait mieux intégrer le programme filière. Pour atteindre ces objectifs, nous avons réalisé des enquêtes à l'aide de questionnaires adressés aux acteurs de la filière avicole dans 4 régions d'interventions du ProLPRAF (Assaba, Hodh El Gharbi, Guidimaka, et Trarza) et dans la région de Nouakchott.

Caractéristiques du site d'étude

Le site de l'étude concernait 4 régions qui font partie de la zone d'intervention du ProLPRAF pour l'année 2011, et la région de Nouakchott. La ville de Nouakchott, capitale de la République Islamique de Mauritanie (RIM) est située au Sud Ouest du pays sur la Côte Atlantique. La région de l'Aassaba est située à environ 600km à l'est de Nouakchott. Un peu plus à l'est encore, se trouve la région du Hodh El Gharbi (800km de Nouakchott) tandis qu'au sud se trouve la région du Guidimaka (600 km de Nouakchott), et ces 2 régions sont bordées par la frontière malienne. La région du Trarza, zone frontalière avec le Sénégal se situe à environ 220km de Nouakchott (*Figure 1*).

Figure 1: Carte de la Mauritanie avec les differentes Wilayas (régions).

Données physiques générales

La température moyenne en RIM varie entre 24 et 25 degrés Celsius avec des maxima et des minima pouvant atteindre 50 et 17 degrés, respectivement. La pluviométrie annuelle varie de 400 mm au sud à 100 mm au nord de la partie sahélienne. Au nord, la pluviosité devient irrégulière, et la moyenne annuelle est peu significative (FAO, 2010). Au début de notre étude en août, la saison des pluies qui venait à peine de commencer est terminée en fin Septembre.

Sols et végétations

La ville de Nouakchott présente un sol sableux avec des dunes de sables observables à la périphérie. Les espèces végétales observables sont parmi tant d'autres le dattier (*Phoenix dactylifera*), le *Prosopis juniflora*, *l'Azadiracta indica*, etc.

Les régions de l'Assaba et du Hodh El Gharbi en zone sahélienne présentent une pluviométrie variant de 150 à 350 mm. Les sols sont rocheux et les ceintures dunaires sont fréquentes. Les espèces végétales rencontrées sont dominées par le *Phoenix dactilifera*, le *Prosopis juniflora*, *l'Acacia albida*, le *Calotropis proceras* et le *Balanites aegyptiaca*, etc. Les principales activités du monde rural sont : l'élevage (bovins, ovins, caprins, camelins, volailles), l'agriculture (sorgho et niébé, en particulier) et le maraichage dans les oasis, y compris la culture des dattes.

La région du Guidimaka en zone soudano-sahélienne se caractérise par une pluviométrie de plus de 400 mm et présente des sols iso-humiques de couleur rouge (FAO, 2000). Les espèces végétales rencontrées sont : Le *Borassus flabelifer L*, le *Ziziphus mauritana*, l'*Adansonia digitata*, le *Balanites aegyptiaca*, auxquelles s'ajoute un tapis herbacé pendant l'hivernage. L'activité du monde rural est dominée par l'agriculture et l'élevage.

Problématique de l'aviculture en Mauritanie

Selon une étude de la FAO (2002), en Mauritanie, le secteur de l'élevage est le secteur où les mécanismes de solidarité sociale sont les plus présents. En effet, les sociétés traditionnelles mauritaniennes sont profondément marquées par l'Islam et intègrent de nombreux mécanismes de redistribution de la richesse et d'appui aux plus pauvres. Cependant, ces mécanismes de lutte contre la pauvreté à partir de l'élevage ne tiennent pas compte de la volaille qui n'était pas considérée comme animal d'élevage auparavant. L'importance de l'éleveur se définie à partir du nombre de têtes de bovins, de camelins, d'ovins et de caprins. La volaille était minimisée et était surtout considérée comme une activité d'enfants, et la viande de volaille ne faisait pas partie des habitudes des consommateurs. De plus, le ministère en charge de l'élevage n'a aucun programme d'appui pour l'aviculture et la direction des services vétérinaires aussi n'importe pas de produits vétérinaires pour la volaille. Tous ces facteurs défavorables au développement de l'aviculture font que la volaille et sa culture sont peu connues des aviculteurs mauritaniens. Les producteurs de volaille ignorent par exemple que le poulet et même les œufs ne supportent pas la chaleur comme le témoigne les *Photos 1* et *2* où l'habitat des poulets et même de la poule couveuse est souvent constitué de matériaux métalliques (tôle ou barrique, récipients métallique..) disposés en plein soleil souvent. Cette situation est valable aussi pour les producteurs de poulets de chair à Nouakchott qui construisent des poulaillers fermés sur tous les côtés avec quelques petites fenêtres dans un climat aussi chaud qu'en Mauritanie *(Photo 3)*.

Photo 1: Couvoir exposé au soleil au Hodh El Gharbi *[Photo: S. Pousga]***.**

Photo 2: Poulailler d'aviculture familiale au Trarza *[Photo: S. Pousga]***.**

Photo 3: Bâtiment de poulets de chair à Nouakchott *[Photo: S. Pousga]***.**

Les autres contraintes de productions demeurent les mêmes qui sont rencontrées en aviculture familiale dans la plupart des pays en développement (Guèye, 1998; Permin, 2001; Pousga et Boly, 2009). Il s'agit entre autres des problèmes relatifs à la santé, à l'alimentation et aux conditions de logement et cela avait été souligné par une étude récente sur l'aviculture en Mauritanie (Salissou et Abderrahmane, 2010). La présence de nombreuses maladies est suspectée en aviculture mais aucune étude précise n'a été faite pour définir ces maladies (FAO, 2002).

Avec l'évolution, la croissance démographique et le changement des comportements, la viande blanche (*Halal*) est rentrée dans les habitudes des consommateurs mauritaniens, et le pays se trouve face à une situation ou la production locale ne peut pas couvrir les besoins des consommateurs d'où les importations massives de viande de volaille congelée des pays développés et cela a aussi contribué à entraver le développement de l'aviculture familiale car ces viandes de poulets congelés proviennent des complexes avicoles avec des poulets présentant un grand format. Ceci explique le développement de petits élevages de poulets de chair dans toute la ville de Nouakchott. Cependant, fort est de préciser aussi que le poussin d'un jour et tous les intrants de production, y compris l'aliment, sont importés et que seul l'élevage a lieu en Mauritanie.

Activités menées

Nous avons d'abord fait une première mission d'étude en août pour visiter les différentes régions concernées par la filière aviculture du projet. Au cours de cette mission, nous avons participé à la mise en place des groupes filières aviculture et maraichage dans l'Assaba, le Hodh el Gharbi et dans le Guidimaka. Après cette mission nous avons

travaillé avec l'équipe du projet sur la mise en place d'un complexe avicole dans la région de la Trarza. C'est ainsi que nous avons mis en contact l'équipe avec une personne ressource dans le domaine de l'élevage des reproducteurs et du bâtiment d'élevage intensif.

Une seconde mission a été organisée en septembre pour discuter avec les groupes filières sur leur plan d'actions. Au cours de cette mission nous avons commencé nos enquêtes à l'aide de questionnaires structurées adressées aux éleveurs de volailles en milieu rural.

Une troisième mission a été organisée en octobre avec pour objectif, l'initiation des groupes filières sur la procédure d'appel d'offres. Au cours de cette mission, nous avons poursuivi nos enquêtes dans les trois régions précitées puis dans la région du Trarza.

Les enquêtes au niveau de la ville de Nouakchott se sont déroulées durant toute la période en dehors des missions, et les cibles à Nouakchott étaient les producteurs, les vendeurs (marchés) et les consommateurs (restaurants).

Enfin en décembre nous avons préparé une formation en aviculture sur les thèmes suivants : Généralités en aviculture, Nutrition du poulet et biosécurité des élevages avicoles. L'équipe du projet n'était pas disponible pour organiser cette formation à cause des nombreux déplacements internationaux qui se sont imposés à eux. De plus notre contrat était arrivé à terme et nous ne pouvions pas prolonger le séjour pour dispenser cette formation que nous avons confié (en plus d'autres documents sur la zootechnie en générale) au responsable de la filière avicole et qui se chargera de dispenser cette formation.

Résultats principaux et discussion

Enquêtes auprès des producteurs

Commercialisation et amélioration des performances du poulet en milieu rural

En milieu rural, le poulet est commercialisée (100% des producteurs vendent leurs poulets en Assaba et au Guidimaka et 95% vendent au Hodh el Gharbi). Cependant, il n'y a pas de marché de volailles ni de points de ventes précis, ce qui fait que la plupart des ventes se fait sur place au sein des ménages (100% en Assaba, 83,3% au Hodh et 80% au Guidimaka), tandis que le reste se fait de façon ambulatoire (12,5% au Hodh et 20% au Guidimaka).

Analyse des prix et contraintes liées à la commercialisation du poulet local en Mauritanie

La situation des ventes montre qu'en moyenne un commerçant vend par jour, environ 16 poulets de chair contre seulement 7 poulets locaux. L'étude des prix montre que le prix du poulet local varie entre 1385±126 et 2325±275 UM, tandis que les valeurs correspondantes pour le poulet de chair sont de 1255±60 et 1470±47 UM (1UM = 0,004 USD). Le poulet local acheté au marché de volailles de Nouakchott est beaucoup plus destiné aux traditions et aux pratiques rituelles (75%) que pour la consommation familiale (25%).

Données collectées auprès des vendeurs d'œufs à Nouakchott

Les œufs seraient importés soit du Maroc (55%) soit du Sénégal (45%). Le nombre moyen d'œufs vendus au maximum par un détaillant par jour semble tourner autour de 3 plateaux de 30 œufs, tandis qu'en moyenne le nombre minimum d'œufs vendus par jour serait de 1,5 plateau. Le prix unitaire moyen de l'œuf est d'environ 43 ± 5 UM, ce qui est comparable au prix unitaire de l'œuf dans les pays voisins.

Enquêtes menées auprès des restaurateurs

Cette étude nous montre que la viande de volaille cuisinée dans les restaurants des quartiers populaires à Nouakchott provient soit du poulet de chair acheté (45%) ou de la viande de volaille congelée importée (55%). Le poulet local est totalement absent dans les restaurants (0%). Les raisons de cette absence sont liées au fait que le poulet local est trop cher à l'achat avec un petit format, ce qui ne permet pas de faire un bénéfice. De plus, les clients se plaindraient si de petits formats de poulets leurs sont servis et surtout si les cuisses de poulets sont petites.

Difficultés rencontrées

Nous avons rencontré diverses difficultés sur le terrain. En effet la méthode de travail qui nous a été imposée par le projet hôte (les missions nocturnes) ne respectait pas les normes de sécurité des Nations Unies qui interdisent tout voyage entre 18H et 6H. Nous avons insisté pour expliquer cela aux responsables du projet mais aussi au premier

responsable du programme *des Cadres Associés en Aviculture* (APA) mais sans gain de cause, ce qui a fait que les responsables de la FAO Mauritanie étaient souvent réticents pour délivrer les ordres de mission. En plus de cela nous avons aussi rencontré des difficultés d'ordre social et religieux.

Conclusions et recommandations

Cette étude nous a permis de faire l'état des lieux de l'aviculture en Mauritanie où l'élevage en général joue un rôle social et religieux très important dans la lutte contre la pauvreté rurale. Cependant, les mécanismes de lutte contre la pauvreté à partir de l'élevage ne tiennent pas compte de la volaille qui n'était pas considérée comme un animal d'élevage dans ce pays.

Recommandations au projet hôte

Le développement de l'aviculture familiale à travers une approche filière ne pourra être possible qu'à la suite d'un grand programme de sensibilisation de la population sur les avantages de l'aviculture :

- La population doit être sensibilisée sur les avantages que présente la viande de volaille pour la santé humaine et surtout celle des enfants et des personnes âgées.
- Il serait important d'expliquer que dans les grands centres urbains il y a cette prise de conscience sur les avantages nutritionnels de la volaille, ce qui justifie d'une part la présence de petits élevages de poulets de chair dispersés dans la ville de Nouakchott, et d'autres part les importations massives de poulets vivants ou congelés des autres pays.
- A travers ce processus de réveil de conscience, les populations rurales pourraient comprendre que non seulement le poulet peut être élevé pour améliorer le statut nutritionnel de la famille, mais aussi pourrait être exporté vers les grands centres urbains comme |Nouakchott, Kiffa, Rosso, etc., et par conséquent pourrait être un produit de commerce intéressant des milieux ruraux vers les grandes villes.
- L'amélioration génétiques des performances des races locales s'avère nécessaire car le métissage pourrait aider à accroitre les performances de la race locale ce qui pourrait être profitable à toutes les catégories de la filière.
- Le programme d'amélioration génétique ne peut atteindre ses objectifs que s'il est accompagné d'un programme d'appui à l'alimentation et à la santé de l'élevage. En effet les producteurs doivent être formés sur l'élevage de la volaille en général et surtout sur les conditions environnementales requises par la volaille dans un climat très chaud comme en Mauritanie. La formation en aviculture que nous avons proposée aux membres de la filière avicole du ProLPRAF doit être vulgarisée aussi au niveau des autres producteurs de volaille.
- L'alimentation demeure la grosse épine de l'aviculture mauritanienne. Ainsi, tout programme de développement de l'aviculture doit d'abord promouvoir la fabrication d'aliment sur place en Mauritanie. En effet, le pays possède l'une des Côtes les plus poissonneuses du monde, ce qui signifie que la disponibilité de la farine de poisson pour la composition des rations alimentaires des volailles ne devrait pas être un problème. La culture de céréales tel que le mais et le blé pourrait être encouragée dans les régions telles que le Trarza, le Gorgol, le Brakna et le Guidimaka qui sont bordées par le Fleuve Sénégal. Ainsi le Ministère du développement rural pourrait être encouragé à mettre en place une usine d'aliment comme cela est le cas au Burkina Faso par exemple.

Recommandations pour le programme APA

Le programme APA est une très bonne initiative de la part de la FAO et du FIDA car cela permet de renforcer les capacités des ressources humaines au sein des projets de développement de l'aviculture dans les pays en développement. Cependant il serait très important que les structures d'accueil soient bien avertis sur le programme APA afin qu'elles puissent s'attendre à recevoir et à travailler avec la personne qui va venir travailler au sein de leur programme. Aussi, il faudrait qu'au moins un des leaders du programme APA puisse faire une visite de prospection au niveau des différents pays d'accueil pour s'imprégner des réalités, afin qu'un projet d'activités plus ou moins réaliste puisse être formulé avant le départ des consultants sur le terrain.

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ACTIVITY REPORT | RAPPORT D'ACTIVITÉ | INFORME DE ACTIVIDADE No 1:

Pan-African Conference on the launch of the *Kuroiler* chicken in Uganda

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*** Representing the International Network for Family Poultry Development (INFPD)'s members and Readers of *"Family Poultry Communications"***

Abstract

A two-day conference, organized by the National Animal Genetic Resources Centre & Data Base (NAGRC & DB), was held at the Imperial Botanical Beach Hotel in Entebbe, Uganda, on the 8th – 9th November 2011 with the aim of launching a hybrid dubbed *Kuroiler* chicken (KC) in the country. In total, 160 participants attended the conference including two members of the INFPD. It was opened with 14 presentations covering different aspects of chicken rearing in Africa. The *Kuroiler* chicken launched at the conference has the phenotypic characteristics of the Local Indigenous Uganda Chickens (LIUC) reared in villages of Uganda but with different genetic makeup. It is produced by KeggFarms in India and was imported to Uganda to study its potential use in the country .The conference was an opportunity to demonstrate the results from the *Kuroiler* trial, showing that it is growing faster than the local chickens (3kg for KC versus 1.5 kg for LIUC in forty weeks), produces more eggs than the local hens (per annum 200 eggs for KC versus 50 eggs for LIUC) and scavenges as well as the LIUC. It was presented that the population in East Africa is 134.06 million inhabitants rearing 94.28 million of chickens out of which 95% are IC and 5% for exotic birds, can use the KC successfully in rural areas. According to the testimonies of farmers, the KC is considered as a tool for poverty alleviation, promotion of women's empowerment and food security while meeting the socio-economic needs and ritual of the rural poor. In addition, it could help to create more jobs for jobless youths. Need for achieving these objectives could be a justification for expanding the *Kuroiler* chicken to other African countries.

Key-words: *Kuroiler* chicken, Indigenous chicken, comparative studies, performances, breeding system, perspective, Uganda.

Conférence panafricaine pour le lancement du poulet *Kuroiler* en Ouganda

Résumé

Une conférence de deux jours, organisée par le National Animal Genetic Resources Centre & Data Base (NAGRC & DB), a été tenue à l'Imperial Botanical Beach Hotel à Entebbe en Ouganda les 8 et 9 Novembre 2011 à l'effet d'inaugurer le poulet hybride dénommé *Kuroiler* (KC) dans le pays. Au total 160 participants ont assisté à la conférence parmi lesquels deux membres du RIDAF. Quatorze présentations ont été faites couvant différents aspects en élevage avicole en Afrique au cours de cette conférence. Le poulet *Kuroiler* inauguré lors de la conférence a les caractéristiques phénotypiques des poules locales (LIUC) élevées dans des villages sélectionnés de l'Ouganda avec toutefois une constitution génétique différente. Ce type de poulet est produit par KeggFarms en Inde puis exporté en Ouganda pour étudier son potentiel de production utilisée dans ce pays. La conférence a été un forum pour montrer que le poulet *Kuroiler* croît plus vite que les poulets locaux (3 kg pour le KC contre 1,5 kg pour LIUC en 40 semaines), produit annuellement plus d'œufs que les poules locales (200 œufs pour KC contre 50 œufs pour LIUC) et divague aussi bien comme la poule traditionnelle. Il est montré que la population de l'Afrique orientale, qui est 134,06 millions d'habitants et élevant 94,28 millions de poulets dont 95% sont des poules traditionnelles contre 5% pour les

oiseaux exotiques, peut aussi bien utiliser le poulet *Kuroiler* en zones rurales. D'après les témoignages des fermiers, le poulet *Kuroiler* a été considéré comme étant un outil d'allégement de la pauvreté qui favorise en même temps l'autonomisation des femmes et la sécurité alimentaire. Il est aussi source de satisfaction des besoins socio-économiques et rituels de la population rurale dotée de peu de moyens. En outre, il contribuera à créer plus d'emplois pour les jeunes désœuvrés. Pour atteindre ces objectifs, il est indispensable que ce type de poulet soit une expérience qui devra être étendue à d'autres pays Africains.
Mots-clés : poulet *Kuroiler*, Poulet local, étude comparative, performances, système d'élevage, perspective, Uganda.

Purpose of the conference

The international "*Pan-African Conference on the Launch of the Kuroiler in Uganda*" was organized on 8th and 9th November 2011 by the National Animal Genetic Resources Centre and Data Bank (NAGRC & DB). The NAGRC & DB is a corporate body in the Ministry of Agriculture, Animal Industry and Fisheries (MAAIF) and has a mandate to spearhead breeding programmes in Uganda. In line with its mandate, it undertook a one year comparative study of local indigenous Uganda's chickens (LIUC) and *Kuroiler* chickens (KC). The KC are bred in India and small numbers were imported to Uganda for the study. Interesting results have been obtained and the NAGRC & DB therefore seized the opportunity to present these to the general public and at the same time launch the *Kuroiler* chickens in Uganda. A total number of 160 participants shared experiences at the conference and 14 participants from Cameroon, France, India, The Netherlands, Kenya, Rwanda, USA and Uganda presented interesting papers. The authors represented the International Network for Family Poultry Development (INFPD) and shared through presentations their experiences about family poultry production with the rest of the scientific participants.

The programme

General subjects

At the opening of the conference, a representative of the Uganda Government expressed his satisfaction with the *Kuroiler* project because of its importance to satisfy the needs of the population. It was pointed out, that the KC could be effective in contributing to alleviate poverty in the rural areas. The first two sessions of the conference were chaired by Dr Rose Azuba, Senior Lecturer of School of Veterinary Medicine of Makerere University, Kampala. The NAGRC & DB board of director's chairman, Dr Benon Kanyima and the Permanent Secretary of the Ministry of Agriculture, Animal Industry and Fisheries Mr. Vincent Rubarema, in their respective addresses pointed out that the nation was facing difficulties from high price of chickens and the increasing population in Uganda which is growing at an annual rate of 3.4%. To meet the needs of the population the food producing sector in Uganda must increase its output. One solution would be to produce with good animal genetic resources like the KC which are fast growing and have higher egg production than the LIUC. This could be made possible by collaboration with Uganda's researchers and the NAGRC & DB. They mentioned that the Government of Uganda through the Ministry of Agriculture had substantially contributed to establish a scientific collaboration with other institutions like the Arizona State University (ASU), SEVA (Animal Health Merial Select Inc), the National Agricultural Advisory Services (NAADS), KeggFarms of India and the farmers who participated to the *Kuroiler* study. This scientific collaboration has led to the launch of the KC in Uganda, and other countries could benefit from Uganda's experience in producing cheap proteins for the population and other needs from this type of bird.

Dr. James Oluka from the National Livestock Research Institute gave an overview of poultry farming in Uganda. He showed that over 73% of the households in Uganda depend directly on agriculture and that the poultry sector has been part of the livestock revolution since the 1990s. With projections of 32.6 million birds in 2006/7 of which 80% were free-range indigenous breeds and 20% commercial exotic types, he said the demand for chicken products cannot be met due to their low productivity in terms of growth rate, carcass weight and egg production. For these reasons, total meat consumption in Uganda is about 5.6 kg compared to 50kg recommended by FAO and WHO. He noted the need to focus attention on increasing indigenous chicken productivity through cross-breeding alongside effective disease control (e.g. vaccination against Newcastle disease). This strategy combines the adaptive attributes of the indigenous chickens with the high producing abilities of the exotic chicken. He shared the outcome of crossbreeding work of LIUC with some high productive breeds (Bovans Brown) which resulted in the development of the SAARI (Serere Agricultural and Animal Production Research Institute) crossbred chicken breed which has both the desirable adaptive characteristics and high meat and egg production. To have optimum production of meat in Uganda, some challenges

needed to be overcome amongst which are HPAI, common poultry disease like NCD, the genetic characterization and conservation, high cost of feed, maintenance of production and supply of improved breeds, lagging extension services-knowledge and skills on management and record keeping.

The Hon. Right Ramirama, Minister of State for Animal Industry sent a speech with an overview of policies and legislations of the livestock sector in Uganda. The speech showed that, although policies exist, a re-formulation of these policies for their better implementation is needed to address the needs of smallholder poultry production farmers.

Dr. D.K.N. Semambo, Executive Director**,** National Animal Genetic Resources Centre and Data Bank (NAGRC & DB), gave a presentation on the role of NAGRC & DB in development of the poultry industry in Uganda. He pointed out why NAGRC & DB was established and its contributions to the livestock industry. He provided a brief overview of the vision, mission, objectives and development status of different livestock species. He stressed that the vision of NAGRC & DB is to ensure that national food security is maintained and poverty eradicated with optimum livestock production and productivity. To do so, one of the NAGRC & DB mandates is to produce, procure and supply good genetic materials (e.g. introduction of the KC). The purpose of introducing the KC in Uganda was to supplement the provision of cash income, food security, nutrition and socio-cultural activities among the poor rural households and not to replace indigenous chicken.

Dr. Helen Nakimbugwe, Technical Manager Breeding, NAGRC & DB, presented an overview of the international poultry industry with reference to breeding. She described the scope of the international poultry industry with reference to layer and broilers including their breeding programs. She also reported on the future of poultry breeding in Uganda.

Dr. Reza Bentaleb, CEVA Santé Animale, gave a presentation about vaccination in commercial and village chicken production. He noted that the vaccination at farm level both in commercial and village chicken production is not reliable (10-50% of the flock might not be protected). He stated that, hatchery vaccination is the most suitable method of vaccination. He outlined the advantages of hatchery vaccination including uniformity and better control of human factors (control and organization of the work) among others.

Dr. Jean Claude Fotsa from the Institute of Agricultural Research for Development (IRAD), Mankon Specialized Research Station in Cameroon, presented a paper with the topic "*Genetic characteristics of indigenous chickens in Cameroon*". He described the different indigenous chicken genotypes *(Pictures 1)*, the existing and introduced germplasms and proposals for indigenous chicken's conservation in Cameroon. He showed that the indigenous chickens are valuable genetic resources at present and in the future. Because most developing countries do not have organizational structures for breeding programmes, uncontrolled crossbreeding practices currently done at the rural areas would not only lead to the disappearance of adaptive traits but will dilute the gene pool and thus negatively influence the existing genetic diversity (especially as the genetic makeup of the imported strains may not be known).

Complete black naked neck

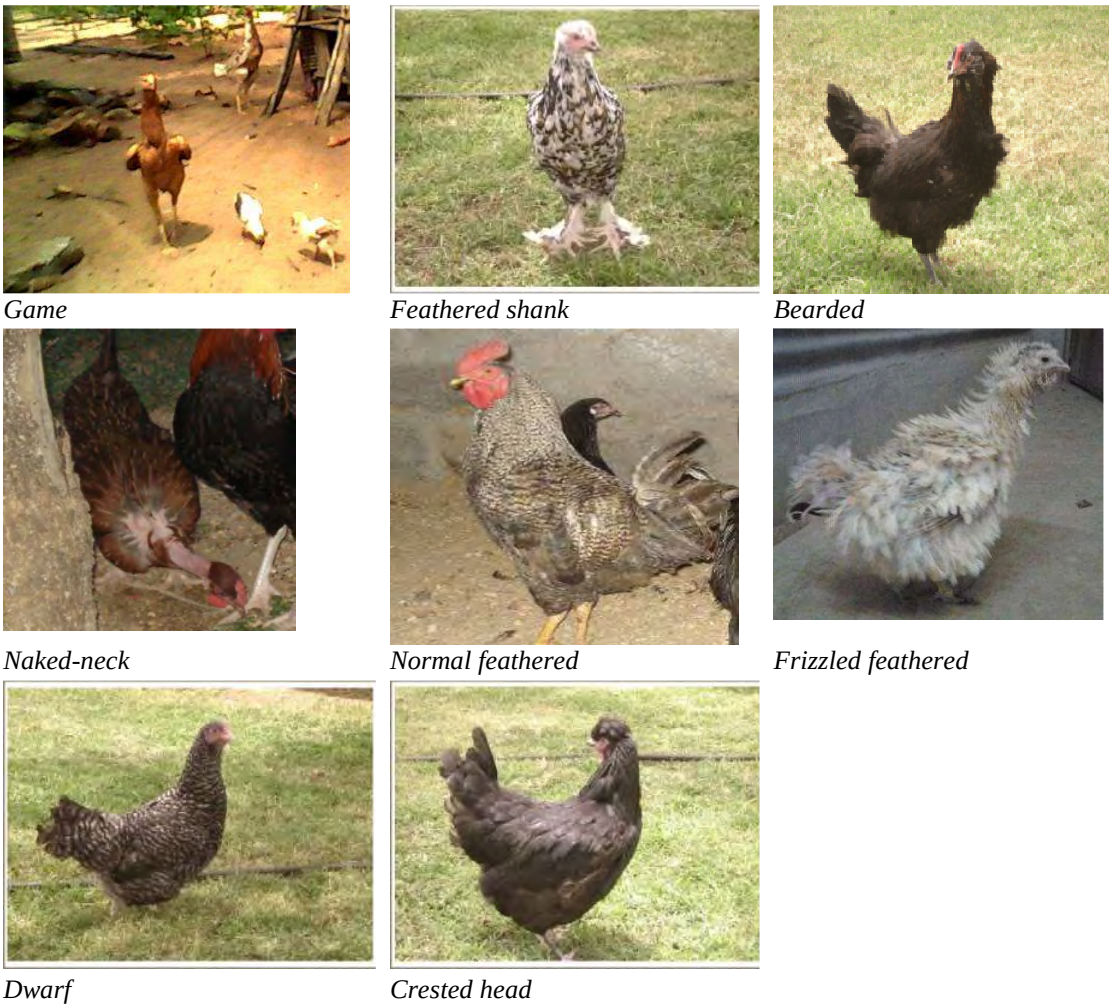
Dominant white and Feathered shanks

Yellow shank chicken

Crested gold feathered hen

Pictures 1: Some phenotypic characteristics of indigenous chickens *[Photo: J.C. Fotsa]***.**

Mr. Kiplangat Ngeno, Wageningen University, The Netherlands, gave a presentation with the topic "I*ndigenous chicken genetic resources: their unique attributes and conservation options for improved use*". In his paper, he discussed five relevant questions that need to be answered if the conservation of indigenous chicken is to become effective and sustainable. The questions include: what, why and how should we conserve? And who are the stakeholders and what are their roles in conservation efforts? He proposed options for *in-situ* conservation (through utilization for egg and meat production) of indigenous chickens with four scenarios that ensure that the genotype is matched with the environment. The paper also explored different genotypes that need to be utilized in a breeding programme *(Pictures 2)*.



Pictures 2: Different indigenous chicken genotypes that can be utilized in breeding.
[Source: Egerton University and Kenyapoutry.org].

Dr. Landry Ndriko Mayigane, Rwanda Agriculture Board (RAB), gave a presentation about "*The success and challenges and opportunities in the poultry industry in Rwanda*". He provided a detailed analysis of Rwanda's poultry sector under the new RAB Structure, the current situation, major constraints, opportunities and the proposed way forward.

Results of the Kuroiler project

The results of the *Kuroiler* project were presented by Dr. Jagdev M Sharma, the Biodesign Institute Center for Infectious Diseases and Vaccinology from Arizona State University, Dr. Galukande Esau, the technical manager Production from NAGRC & DB, Dr. Semambo, the Executive Director (NAGRC & DB) and Mr. Vinod Kapur from KeggFarms in India respectively. The study revealed that the *Kuroiler* birds were similar to indigenous chickens in feather colors but differed in economically important traits. *Kuroiler* birds outperformed the indigenous birds in growth

rate, body weight, hatchability, number of eggs produced and egg size. *Kuroiler* eggs were superior in terms of the hatchability (79.6%) compared to (47.1%) for LIUC. The hatchability for fertile eggs set was high (89.6%) for KC as compared to (69.8%) for LIUC eggs. *Kuroiler* chickens grow faster and were heavier at all ages with a mature bodyweight of 3kg (males) compared to 1.5-2kg for LIUC cocks. The *Kuroiler* had superior egg production of 200 eggs per year compared to 40 eggs produced by the LIUC. Farmers' perception towards *Kuroiler* was also positive because of its high growth rate, persistent laying, good temperament and ease of management as compared to LIUC under the same backyard system of production. It was stated that the KC is a micro-package of meat which can be consumed by a family in one or two meals or served to a guest, unlike in the case of larger animals like goats/sheep or cattle. It requires minimal support from householder other than the handful of broken grain and a rudimentary night shelter. The KC has been described as a credit card with feathers – instantly available for sale or barter. It provides pest control, manure and is used in festivals and special occasions. Since KC does not need high energy/sophisticated feed, it can be raised in rugged conditions. Therefore, Ugandans can use this type of chicken to satisfy their basic needs in the same way as they do with LIUC with the difference that the latter grow slowly and produce a small number of eggs.

However, many challenges have to be overcome expressed by the following questions:

- Could it be possible to develop a multicoloured bird which will produce more eggs, more meat and live better in the harsh village scenario essentially on scavenging without costly materials thereby converting an incidental household activity of village women into a remunerative activity?
- Could a delivery system be created to reach the village householders at their doorsteps?

The KC can be a solution since this bird is a genetic product for the village environment, capable of expressing its performance potential in a hostile, resource poor and foraging village environment.

The KC can convert no cost natural and village waste into protein food for humans. Testimonies from Indian stakeholders show that women could be empowered by rearing the KC. Things that farmers liked about the KC are: fast growth rates, higher egg production than locals, color, and survival. But some concerns were expressed about the aggressiveness of some *Kuroiler* cocks and their higher feed consumption compared to local birds. Even though all types are scavenging birds the *Kuroiler* hens are not egg sitters and the mortality for these birds can be as high as 100% if proper management is not provided. Despite these constraints, better production recorded for the KC is the main benefit that leads to women empowerment, enhancement of self esteem, support for family and children.

According to the information from the promoters of the KC in Uganda and the assumptions based on the results of the study, future plans for distributing *Kuroiler* in rural Uganda, and maybe in other African countries, could lead to the following outcomes:

- 133% increase in meat production;
- 462% increase in egg production; and
- 341% increase in income per family and per year.

Experiences from producers in India have shown that the introduction of *Kuroiler* in the rural social fabric has resulted in a vast array of both tangible and intangible benefits. The trial in Uganda indicates that similar results are also possible in many African countries.

The presentation showed that the East Africa climatic conditions produce a bountiful nature, with abundance of greenery, adequate foraging space in homesteads which are suitable conditions for raising *Kuroiler* chicken and most importantly that there is a tradition of poultry rearing. In addition, the KC survive and deliver eggs/meat by converting no cost agricultural, village natural waste, insects, worms and small live organisms in the same way as village chickens. By adopting this type of chicken with high performances but with similar plumage color and scavenging attitudes as the local chickens, Uganda could become the main supplier of breeding material for most of the neighboring countries. International funding institutions may find this an attractive opportunity but Uganda's government policies for poultry development need to be made conducive.

Considering commonalities and differences between India and Uganda, KeggFarms representatives proposed a *Kuroiler* model for the ground realities of the value chain in Uganda. The model is composed of an industrial component, a semi-industrial component and rural distributors. The industrial component includes parent stock farms and hatcheries. KeggFarms would own the parent stock unit and supplying hatching eggs, facilitate supply of other inputs from India, sharing of know-how experience and training of personnel. The semi-industrial component and hatchery would be owned by NAGRC & DB and be responsible for production of day old chicks (mother units), supplying chicks to farmers and vendors *(Figure 1)*. Mother units would be responsible for rearing and vaccination of chicks up to 3 weeks of age at a scale of 1000 day-old-chicks (DOCs) per month.

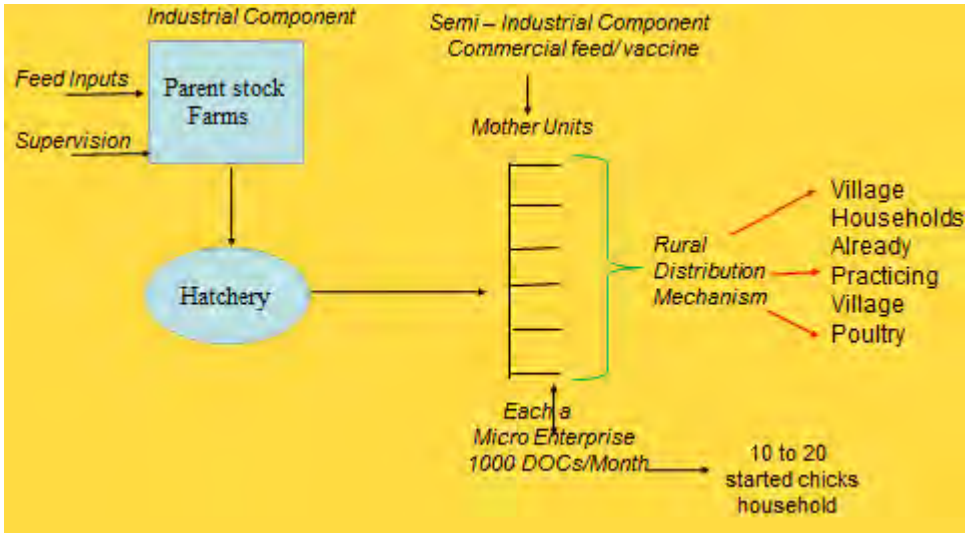


Figure 1: Suggested linkages of Kuroiler model in Uganda.

Under the chairmanships of Dr. Mugenyi from the National Agricultural Advisory Services (NAADS) and Mr. Henry Busulwa, Senior Farm Manager (NAGRC & DB) respectively, all the presentations were followed-up by a series of questions related mainly to the performances of *Kuroiler* chicken, the lack of policy for poultry development in Uganda, the genetic makeup of the newly introduced bird (KC), and the way to establish hatchery units in Uganda to produce KC day-old-chicks for the populations.

After responding to these questions by the poultry experts present at the conference, there was a great satisfaction of the participants.

Comments from the authors

- The Kuroiler chicken is made of selected chicken lines that were imported into India several years ago and is now maintained by KeggFarms. So according to the presenters the present genetic makeup cannot be disclosed.
- To perform as in the trials, farmers would have to purchase day-old-chicks or fertile eggs from the Kuroiler parent stock farms. Furthermore, KC should not be used for breeding purposes.
- Women in India have used the KC and have improved their standard of life. The testimonies obtained from the farmers who participated in the study were not different.
- If farmers want to increase their income, they could choose the KC but their feed requirements are higher than those of the LIUC. If this cannot be ensured, producers should remain with their LIUC.

Views of the promoters of *Kuroiler* chickens

- The model adopted in India and introduced in Uganda can be replicated and adapted in other countries where village poultry is a tradition and eventually everywhere. The KC converts no cost natural and village waste into protein food for the population.
- Backyard poultry using *Kuroiler* can be a tool for poverty alleviation, woman empowerment and food security for the rural population and for those who could consider poultry rearing as a lucrative activity.
- The *Kuroiler* chickens' experience can be successfully expanded in East Africa (Tanzania, Kenya, Uganda, Rwanda and Burundi) with a total human population of 134.06 million rearing 94.28 million of chickens out of which 95% are still indigenous and 5% exotic birds.
- Rearing of *Kuroiler* chickens can be an incentive for chicken rearing by otherwise jobless youths.

Views of the INFPD representatives

- ***Management:*** In situations where farmers are capable of providing low to medium inputs such as water, supplementary feeds, little medication among others, high producing and adapted chickens are the most suitable.

Therefore, *Kuroiler* chickens that have low input cost with improved productivity and which are highly adapted are recommended. In hot environments, crossbreds of KC with Naked-neck or Frizzle feathered LIUC genotypes may be suitable. This crossbreeding should not be done at the farmer's level or by the farmers but in the State Research Institutions or Universities. In this case, the improved local Naked neck and Frizzle chickens will be then crossed with KC. The product will be then dispatched to the farmers. In rural areas, dominated by the scavenging production system where management is suboptimal and chicks and mature chickens are left to forage, dependence on adapted LIUC will exist for the foreseeable future and the solution *may li*e with the genetic improvement of the LIUC through selection.

- ***Conservation of local Uganda indigenous chickens:*** *Kuroiler* chickens were introduced to the scavenging production system and birds were allowed to intermingled with local chickens. In this case, uncontrolled crossbreeding will not be avoided. Such crossbreeding (KC mated to LIUC and vice-versa), will lead to a genetic erosion of the local chicken biodiversity. This is against the current global move on conservation of indigenous genetic resources.
- ***Sustainability:*** Crossbreeding and upgrading using exotic birds in the past led to improved local chicken production (growth and egg production). However, reports from several countries indicated that the strategies were not always sustainable. The *Kuroiler* chickens were introduced in Northern Ethiopia a few years ago but this was discontinued (personal communication). The basis of the discontinuation in Ethiopia needs to be determined especially from the farmers point of view. However, due to differences between countries, patience is needed regarding the Ugandan case to allow for proper evaluation of the performance of *Kuroiler* in different production systems after 3-4 generations.

Acknowledgements

The authors are thankful to the organizers of the conference and for support from the IFAD funded FAO/INFPD project "Smallholder Poultry Development - (GCP/INT/197/IFA) for sponsoring their trip to Uganda. This opportunity has allowed them to share their experiences with the scientific communities present at the Conference *(Pictures 3 & 4)*.

Pictures 3: Launching of the Kuroiler chickens in Uganda by Ugandan's authorities and KeggFarm's staffs *[Photo: J.C. Fotsa]*.

Picture 4: A family photo taken by the participants at the launch of the *Kuroiler* Chicken in Uganda at the Imperial Beach Hotel on the 8-9 November 2011, Entebbe, Uganda *[Photo: J.C. Fotsa]***.**

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ACTIVITY REPORT | RAPPORT D'ACTIVITÉ | INFORME DE ACTIVIDADE No 2:

Outcome of the International Conference on Innovations in Agricultural Extension and Advisory Services: Implications for Family Poultry Development

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The Technical Centre for Agriculture and Rural Cooperation (CTA) in collaboration with eighteen (inter-) national organizations including the Food and Agriculture Organization of the United Nations (FAO) and the International Fund for Agricultural Development (IFAD) organized an *International Conference on Innovations in Extension and Advisory Services: Linking Knowledge to Food and Livelihoods"* from 15-18 November, 2011 in Nairobi, Kenya. The conference attracted over 400 participants from Asia, the Caribbean, Africa, Europe and the United States of America (*Picture 1*). Participants came from different backgrounds, including farmers, representatives from farmers' organizations, extension agents, the media and other advisory service providers from the public or private sector, researchers, academicians, policymakers, non-governmental organizations and development agencies. Family poultry stakeholders were also represented at the conference by two Associate Poultry Advisers (Mr. Valentine Nchinda, Ms. Irene Ogali) and the FAO Livestock Development Officer, Dr Olaf Thieme. Dr Olaf Thieme presented a paper on *"Promoting family poultry production through a knowledge network and training of key staff in development projects"*.

Picture 1: Cross-section of Nairobi Conference participants *[Photo: V.P. Nchinda].*

The conference deliberations focused on four thematic areas: capacity development, tools and approaches, learning networks and policy issues related to extension and advisory services and included plenary sessions, thematic deliberations, and an exhibition (*Picture 2*). The conference produced recommendations geared at shaping the way Policy, Capacity Building, Learning Networks, Tools and Approaches should be applied in the areas of extension and advisory services. These recommendations are meant to be utilized by all stakeholders to improve food security and livelihoods in developing countries worldwide, including those interested in the promotion of family poultry. This paper provides an analysis of the conference resolutions/recommendations and globally their implications for family poultry development. Details about the conference could be found at: http://extensionconference2011.cta.int/

Picture 2: FAO stand and sponsored participants *[Photo: V.P. Nchinda].*

Recommendations of the Conference on Innovations in Extension and Advisory Services

- Develop clear policies and strategies for extension and advisory services in a participatory manner;
- Clarify the roles and responsibilities of the various stakeholders engaged in extension and advisory service delivery and put coordination mechanisms and quality assurance in place;
- Allocate funding within national budgets for extension and advisory services and ensure that these are used efficiently to provide high quality services
- Develop public and private funding mechanisms for tools and approaches that ensure sustainability and risk sharing;
- Ensure continuous learning and foresight in providing the services and tools which take into account culture and tradition, using Information and Communication Tools (ICTs) and media for maximum reach so that millions of smallholder farmers can move up the value chain;
- Develop and implement processes for monitoring, evaluating and conducting impact assessments and research in a participatory manner to facilitate learning, accountability, efficiency and empowerment;
- Develop capacity in extension systems to learn from farmers and to diagnose their constraints with them.

Implications of the recommendations of the conference for family poultry development worldwide

Family poultry is considered an important entry point to address the problems of malnutrition, food insecurity, low income and poverty. It is carried out by over 95% of rural population, especially the poor, in most developing countries. The conference recommendations re-emphasized the importance of adopting innovative extension/advisory service strategies meant to cope with problems of malnutrition, food insecurity, low income and poverty hence family poultry. Consequently, governments, donors, farmers and likeminded persons are urged to allocate financial and human resources to promote livelihood improvement programmes which should include those for family poultry. Efforts must therefore now be made to include family poultry as a major livestock development priority in poverty reduction strategy papers of developing countries and to get adequate budgets allocated by the national governments for the development of the subsector with emphasis on the Family Poultry Value Chain. The civil society, parliamentarians, policy makers and donors have to be made aware of the importance of family poultry production to get support and advocate for the prioritization of family poultry in the development agenda of developing economies. Efforts must also be made to build the capacity of extension workers and advisory service providers to better promote family poultry husbandry as an indisputable means of livelihood improvement. On the other hand, the academia should consider this important but neglected livestock activity in the teaching curriculum of extension workers. The existing networks, in particular the International Network of Family Poultry Development (INFPD) and other resources in the domain are learning avenues that must be better exploited to build the capacity of extension officers and stakeholders interested in family poultry development. As a working group of the World's Poultry Science Association (WPSA), the INFPD also has the opportunity to reach an even wider audience. It is therefore time for those interested in alleviating poverty through

family poultry to join and become more actively involved in the activities of the this learning networks.

In as much as it is important to network and learn, it is also incumbent for all stakeholders to participate in the implementation, monitoring and evaluation of all policies/programmes geared at developing the family poultry subsector. The tax payers mobilized funds for the promotion of family poultry must be efficiently used and accounted for as per the 2005 Paris aid effectiveness principles. The conference therefore called on all stakeholders to attach a lot of importance to impact studies for reasons of accountability, feedback and policy formulation or improvement. More impact studies, among other specialized ones, must be carried out to assure tax payers that resources allocated for family poultry interventions around the world are efficiently used.

Extension officers and advisory service providers were also called upon to recognize the fact that indigenous knowledge required for the development of family poultry may exist in communities where they operate. The extension/advisory service providers (including researchers, agro-processors, marketers, etc) were therefore urged to adopt a participatory approach to get the farmers (and other stakeholders) involved as well as to learn from each other. Furthermore, international development agencies also need to liaise with national governments and available expertise in promoting family poultry. FAO and IFAD have this experience to share as they have done so with governments of Haiti, Egypt, Tanzania, Swaziland, Niger just to name a few.

The use of media in communication/dissemination of information and feedback from stakeholders was equally highlighted. The use of ICTs and media permits maximum reach to smallholder family poultry farmers with innovative experiences that can go to improve the productivity of family poultry and strengthen the value chain.

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XXIV World's Poultry Congress in Salvador-Bahia, Brazil *[05-09 August 2012]*

The Organising Committee has great pleasure in extending a warm invitation to everyone with interests in the poultry and allied industries to attend the 24th World's Poultry Congress (WPC2012), which will be held at the Bahia Convention Center in Salvador-Bahia, Brazil, 5 to 8 August 2012. The Congress will have a technical-scientific program with lectures on several fields of poultry production, with renowned speakers from all over the world. Scientific studies will also be presented.

This will ensure an outstanding event!

The 24th edition of the WPC will also celebrate the 100th anniversary of the foundation of WPSA – World's Poultry Science Association.
Scientific studies will be presented, and abstracts will be accepted in the following areas:

- Nutrition and feed technologies
- Poultry health and biosecurity
- Chicken breeder and broiler production
- Commercial egg production and processing
- Poultry welfare and environment
- Food safety
- Economics and marketing
- Other Poultry species and production systems, including turkeys, ducks and others
- Genetics and breeding
- Family poultry production, education and extension

Scientific studies schedule:

- 08 January 2011 – 31 January 2012 : Submission of abstracts
- 08 January 2012 – 28 February 2012 : Evaluation of abstracts
- 05March 2012 : Acceptance or rejection of abstracts notified
- 05March 2012 – 31 March 2012 : Registration and submission of the extended abstracts

Guidelines for the submission of Abstracts for publication in the Congress Proceedings can be seen at: www.wpc2012.com/index.php?pagina=submissao
Website: www.wpc2012.com
Contact: wpsa.br@facta.org.br

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IX European Symposium on Poultry Wealfare in Uppsala, Sweden *[17-20 June 2013]*

At this meeting it will be shared and discussed the latest developments, scientific findings and experiences in order to assist the poultry industry to keep bird welfare at high levels and in line with future demands while maintaining production at acceptable levels.

Venue:
"Loftet" at Ultuna Campus of SLU, Swedish University of Agricultural Sciences, 6 km south of central Uppsala city.
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Critical dates:

- 01 October 2012 : Submission of abstracts
- 12 December 2012 : Acceptance or rejection of abstracts notified
- 01 March 2013: Submission of accepted full papers

Contact:

For information about the scientific programme, please contact:

Scientific Committee

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Conference Secretariat

For additional information about the practical details, registration and accommodation, please contact:
Academic Conferences
Tel: +46 18 67 10 03 ; Fax: +46 18 67 35 30
E-mail: poultrywelfare2013@slu.se
For more information, please visit the website: www-conference.slu.se/poultrywelfare2013

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A new INFPD Executive Committee elected

Preparatory to the next biennial General Meeting of International Network for Family poultry Development (INFPD) that will hold during the XXIV World's Poultry Congress (WPC) in Salvador - Bahia, Brazil, there was a need to elect new officers to run the INFPD for the next 4 years. Knowing well that majority of us may not be able to attend the WPC, it was agreed by the Executive Committee that all members should be given the opportunity to nominate (and be nominated) and to elect officers for INFPD for the next 4 years (2012 – 2016). Therefore an electronic consultation was run from 23 September 2011 to 23 December 2011 in order to allow all INFPD members to cast their votes. The deadline for the election was extended three times in order to get at least 50% of our members voting to make the elections credible. Hundred sixty-four (164) votes were cast as of December 24, 2011.

Find below the results of the elections into INFPD Offices.

Post	Candidates	Votes	Results
Coordinator	Marco Cisneros (Equador)	24	
	E. Fallou Guèye (Senegal)	**140**	**Elected**
Secretary	**Md. A. Saleque (Bangladesh)**	**92**	**Elected**
	E. Fallou Guèye (Senegal)	72	
Editor-in-Chief, *FPC**	**Jean-Claude Fotsa (Cameroon)**	**98**	**Elected**
	Salimata Pousga (Burkina Faso)	66	
Deputy Editor-in-Chief, *FPC**	**J. Oluwasola Agbede (Nigeria)**	**109**	**Elected**
	Salimata Pousga (Burkina Faso)	55	
Ex-Officio	**Brigitte Bagnol (Mozambique/South Africa)**	**88**	**Elected**
	Cida Cruz (Bolivia)	76	

**FPC: Family Poultry Communications*

Thank you very much for active participation. Let me wish you all a very productive Year 2012.

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Un nouveau Comité Exécutif du RIDAF élu

Dans le cadre des activités préparatoires à la prochaine Assemblée Générale biannuelle du Réseau International pour le Développement de l'Aviculture Familiale (RIDAF) qui se tiendra lors de la XXIVème Congrès Mondial de l'Aviculture (CMA, ou *World's Poultry Congress*) qui se tiendra à Salvador- Bahia au Brésil, il a été nécessaire d'élire de nouveaux dirigeants du RIDAF. Sachant bien que la majorité d'entre nous peut ne pas pouvoir participer à ce congrès, le comité exécutif a décidé que la possibilité soit donnée à tous les membres de nommer (et d'être nommés) et d'élire les dirigeants du RIDAF pour un mandat de 4 ans (2012 – 2016). Ainsi, une consultation électronique a été organisée du 23 septembre 2011 au 23 décembre 2011 afin de permettre à tous les membres du RIDAF d'effectuer leurs votes. La date-limite pour l'élection a été reportée à trois reprises afin d'obtenir au moins 50% de nos membres votant pour rendre les élections crédibles. Cent soizante qutre (164) votes ont été enregistrèes à la date du 24 decembre 2011.

Prière de trouver ci-dessous les résultats des élections aux Postes du RIDAF.

Poste	Candidats	Votes	Résultats
Coordonnateur	Marco Cisneros (Équateur)	24	
	E. Fallou Guèye (Sénégal)	**140**	**Élu**
Secrétaire	**Md. A. Saleque (Bangladesh)**	**92**	**Élu**
	E. Fallou Guèye (Sénégal)	72	
Éditeur en Chef, *CAF**	**Jean-Claude Fotsa (Cameroun)**	**98**	**Élu**
	Salimata Pousga (Burkina Faso)	66	
Éditeur en Chef Adjoint, *CAF**	**J. Oluwasola Agbede (Nigeria)**	**109**	**Élue**
	Salimata Pousga (Burkina Faso)	55	
Ex officio	**Brigitte Bagnol (Mozambique/Afrique du Sud)**	**88**	**Élue**
	Cida Cruz (Bolivie)	76	

**CAF: Communications en Aviculture Familiale*

Je vous remercie beaucoup pour votre participation active. Permettez-moi de vous souhaiter tous une très productive Année 2012.

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Un nuevo Comité Ejecutivo del RIDAF elegido

En preparación a la próxima Asamblea General bienal de la Red Internacional para el Desarrollo de la Avicultura Familiar (RIDAF) que celebrará durante el XXIV Congreso Mundial de Avicultura (CMA ó *World´s Poultry Congress)* en en la Bahia-Salvador, Brasil, había una necesidad de elegir elige a nuevos oficiales para funcionar el RIDAF. Sabiendo bien que la mayoría de nosotros puede no poder atender al WPC, fue convenido por el Comité Ejecutivo que todos los miembros deben ser dados la oportunidad de nominar (y ser nominado) y de elegir a los oficiales para RIDAF por los 4 años próximos (2012 - 2016). Por lo tanto una consulta electrónica fue funcionada con del 23 de septiembre de 2011 al 23 de diciembre de 2011 para permitir que todos los miembros de RIDAF emitan sus votos. El plazo para la elección era tres épocas extendidas para conseguir por lo menos el 50% de nuestros miembros que votaban para hacer las elecciones creíbles. Cientos sesenta y cuatro (164) votos fueron emitidos en el día 24 de diciembre de 2011.

Encuentre debajo de los resultados de las elecciones en oficinas del RIDAF.

Posición	Candidatos	Votos	Resultados
Coordinador	Marco Cisneros (Ecuador)	24	
	E. Fallou Guèye (Senegal)	**140**	**Elegido**
Secretario	**Md. A. Saleque (Bangladesh)**	**92**	**Elegido**
	E. Fallou Guèye (Senegal)	72	
Editor en Jefe, *CAF**	**Jean-Claude Fotsa (Cameron)**	**98**	**Elegido**
	Salimata Pousga (Burkina Faso)	66	
Suplente de Editor en Jefe, *CAF**	**J. Oluwasola Agbede (Nigeria)**	**109**	**Elegido**
	Salimata Pousga (Burkina Faso)	55	
Ex-Oficio	**Brigitte Bagnol (Mozambique/Sudáfrica)**	**88**	**Elegido**
	Cida Cruz (Bolivia)	76	

**CAF: Comunicaciones en Avicultura Familiar*

Gracias mucho por la participación activa. Déjeme desearle todo el un año muy productivo 2012.

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