Proceedings of the African Poultry Network Workshop

25 October 2013
Antalya, Turkey

The workshop was held in conjunction with the
International Congress on Advancements in Poultry Production
In the Middle East and African States

21-24 October 2013
Antalya, Turkey

Table of Contents

Background and rationale to the workshop

The inaugural meeting of the African Poultry Network (APN) was held in Tours, France at a workshop organised by WPSA following the European Poultry Conference in September 2010. This followed a proposal within WPSA that an electronic network involving sub-Saharan WPSA branches and other organisations be established, with the principal aim of promoting poultry science and education and the development of the poultry industry (across all production systems) throughout sub-Saharan Africa, through scientific and educational exchanges and collaboration and cooperation between members of the Network. The eight person Steering Committee of the APN formed at the meeting in Tours included representatives from Cameroon, Togo, Nigeria, Ghana, Tanzania, Kenya, Mozambique and South Africa.

The activities of the Network have gathered pace in recent times with the establishment of a website and the drafting of a constitution. Members of the Steering Committee have recently been engaged in preparing information on poultry research personnel, projects and capability and on poultry education and training personnel and programmes in the countries of the region. It was thus considered timely that the key players should come together to share and discuss their respective activities and achievements and to develop future action plans for the Network.

The proposed *International Congress on Advancements in Poultry production in the Middle East and African States* in Antalya from 21-24 October 2013 was seen as an ideal meeting to which the proposed workshop might be attached. The focus of this meeting was to promote poultry science and improve the efficiency of poultry production in the countries of the Middle East and Africa. In addition to providing a venue and all the required arrangements for staging the workshop and accommodation facilities etc for the participants, the above focus of the main conference was seen as being very much in line with that of the proposed workshop, and it was considered that participants at the workshop would benefit greatly from attendance at the Congress prior to the workshop.

An application was made to CTA to support the attendance at the workshop of eight African members of the APN Steering Committee. Each of them has played an important role in the development of the Network and, as shown in the following workshop program, each was required to make a significant contribution to the outcomes of the workshop. The success of the Network depends upon effective linkages between dedicated members across the sub-Saharan region of Africa. All of the nominated participants have demonstrated their dedication to the aims and objectives of WPSA and the Network, and coming as they do from eight sub-Saharan African countries, they provide a valuable human resource base for the development of the African Poultry Network.

The application to CTA was successful, for which we are indeed grateful, and all eight nominated Africans were able to attend the Congress and Workshop. CTA funding fully covered the attendance costs of the eight nominated participants at the Congress and Workshop, which included airfares, other travel costs and accommodation and meal costs in Antalya and, where required, in transit. We are also very much indebted to Professor Ruveyde Akbay and the Organising Committee of the Congress for their willing agreement to the staging of the Workshop in conjunction with the Congress and for provision of the room and associated facilities.

Dr Robert Pym

APN WORKSHOP PROGRAM

Venue: Antalya-Turkey
Date: 25/10/2013

Date	Activity	Time	Presenter	Session Chairperson
25/10/2013	Arrival of Participants and Registration	7:00 – 8:00		
	Welcome and pace setting: (Aims and expectations of the workshop)			
	Welcome address by Session Chairperson	8.00 – 8.15	Prof. F. Sonaiya	Prof. F. Sonaiya
	Opening Address by WPSA President	8:15 -8:30	Prof. Dr. Edir N. Silva	
	Welcome Address by chair WPSA-Africa Action Subcommittee (Aims and expectations)	8:30 – 8:45	Dr. Bob Pym Chair WPSA – Africa Actions Subcommittee	
	APN: Vision, Mission, Objectives and Challenges	8:45 – 9:10	Dr Rosa Costa	
	Achievements by APN			Prof. Daisy Eruvbetine
	Draft APN Constitution: structure and content	9:10 – 9:30	Thomas J. Kaudia	
	Information communication and technology strategy for APN i. Managing and Populating APN website ii. APN Website demonstration	9:30 – 10:00	Dr. H. Swatson	
	Morning tea	10.00 – 10:20		
	Challenges and opportunities facing APN			Comfort Acheampong
	Overview of poultry production in sub-Saharan Africa (Commercial)	10:20 – 10:40	Dr Kevin Lovell	
	Overview of poultry production in sub-Saharan Africa (Small-scale Family Production)	10: 40 – 11:00	Prof Uswege Minga	
	The current situation and potential role of APN on:			
	(a) Poultry Research activity and capability	11:00 – 11:20	Dr Jak Tona	
	(b) Education, Training and capacity building	11:20 - 11:40	Prof. Daisy Eruvbetine	
	(c) Poultry extension services	11:40 – 12:00	Dr J. C. Fotsa	

Date	Activity	Time	Presenter	Session Chairperson
	Group Discussions on potential role of APN impacting a,b,c above	12:00 – 13:15		
	Health Break	13:15 – 14:00		
	Plenary Discussions			Dr. Bob Pym
	Group Presentations	14:00 – 14:30		
	The role of the APN in poultry development in Africa	14:30 – 15:00	Dr. Michele Tixier Boichard	
	Fine tuning on APN vision, mission and Constitution, objectives and way forward	15:00 – 15:30	Prof. F. Sonaiya	
	Action plan for APN i.Funding ii. Activities, iii. target groups / stake holders iv.Strategic partnerships v.Human Resource Development vi.ICT strategy vii. Business Plan vii. APN committee and WPSA meeting	15:30 – 16:45	Group	Dr. H. Swatson
	Conclusions / Recommendations	16:45 – 17:15	Dr. Michele Tixier Boichard	
	Closing Remarks and vote of Thanks	17: 15 – 17:30	Dr. Bob Pym	

APN WORKSHOP
Venue: Antalya-Turkey - Date: 25/10/2013

Opening Address

Edir N Silva
WPSA President

Dear Colleagues, committee members and friends.

I would like to thank all present. Your participation is so valuable. Special thanks to Bob Pym, the chair of the steering committee whose hard work and preparation has made this meeting possible.

Special recognition and appreciation to CTA, for funding support for members of the African Poultry Network Steering Committee, to attend and participate in this Congress and Workshop.

Much appreciation to everybody who is presenting papers.

It is a unique opportunity to have us all together, so it is most important we use our time objectively and productively.

Our main objective is to make a difference and impact on poultry development in Africa. We aim to stimulate production increasing its value as a protein source, focusing on facilitating development of poultry science capability in sub-Saharan Africa through Science and technology capabilities.

I would like to emphasize the necessity to approach action in Africa in terms of production chain network, taking into consideration natural resources, geography, land use and population.

In order to make headway our focus should be on the implementation of tried and tested methods, using existing partnerships and connections; and, not to spend too much time on bureaucracy, regulation and administration methods.

APN Constitution should be a link for WPSA branches and should be as simple as possible with flexible bylaws.

The integration of production and cooperation is an essential factor in this process. So, it would have been more beneficial if more representatives of the producing sector were present at this workshop. I would like to stress the importance of producers input in the whole process.

Education, training programmes, may be our best tools to make a genuine difference on the ground. I hope we can arrange a schedule with a defined, productive plan and a programme for genuine action on the ground. This is a programme that will not discriminate against small scale farming, but one that treats level of production equally, where all sectors coexist and the development is natural.

My recommendation is to think of the possibility of organizing biannual APN Congress based on solving field problems, rotating through African local/regional WPSA Branches. More specific Satellite Seminars could be organized together or separately as another APN activity. A partnership for a Poultry Exhibition along with the APN Congress could be an important financial fund source.

Thank you all once again, and I look forward to taking on this challenge with you all.

APN Vision, Mission, Objectives and Challenges

Rosa Costa
Member APN Steering Committee, Mozambique

Kyeema Foundation, PO Box 1168, Maputo, Mozambique

VISION

"To be the leading poultry information exchange network in promoting development of all sectors of poultry production and poultry industry in sub-Saharan Africa, in support of a prosperous African Poultry Sector".

MISSION STATEMENT

"APN should promote the development of all sectors of poultry production and poultry industry in sub-Saharan Africa, through the dissemination of research, education, training and development information".

STRATEGIC OBJECTIVES

1. To promote WPSA activities in all the countries of Africa with special emphasis in sub-Saharan Africa.

2. To help expand membership of the WPSA in all African countries by creating new contacts with people involved in the poultry sector.

3. To promote the spread of knowledge in the field of poultry science through encouragement for research, education and extension.

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5. To promote the spread of knowledge in the field of poultry science through encouragement for research, education and extension.

VALUES FOR EXCELLENCE

- **Integrity:** Carry out all our work with the greatest responsibility and accountability
- **Service:** Be of benefit to the public and our stakeholders
- **Excellence:** in All We Do
- **Diversity:** Capitalize on the richness inherent in differences regions
- **Ethical behavior:** Carry out all activities in accordance to accepted social standards.
- **Innovation:** Be creative and problem solving.

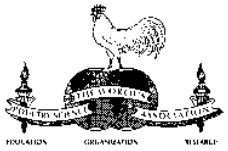
CHALLENGES

- **Funding:** APN implementation crucially hinges on the ability of fund raising and mobilising additional funding for:
    - exchange and distribution of publications;
    - participation in regional and international congresses; and
    - the organization of workshops on specialised topics
- **To ensure a strong element of voluntary collaboration and sense of ownership:** The African Poultry Network relies for the most part on electronic communication between the participants and stakeholders. It will only attain it´s objectives if between and within countries members have a strong element of voluntary collaboration and sense of ownership. Members must be self-motivated and consistently communicating or exchanging information.
- **APN Structure:** The APN structure is made by representatives from five geographical regions. All APN members will be WPSA members, either individual member or member of a local WPSA branch. If there are too many dormant members and insufficient feedback the network may not function.
- **To ensure the involvement of all stakeholders:** The APN should be constituted by a group of individual WPSA members and WPSA branches from the region, linked together on a voluntary basis with the primary objective of exchanging information on themes related to poultry production in cost-effective ways. The network has to adopt an "across production sector" approach. All poultry production sectors should be included, ranging from small-scale family, semi scavenging production with indigenous birds, through to large scale commercial meat and egg production. It is desirable that all elements of the industry and as many groups supporting the industry as possible, (from as wide a geographical distribution as possible), be represented in

the APN. This include industry personnel from the breeding companies, hatcheries, feed mills, processing plants and producers, as well as scientists, technicians, educationists and government, NGOs, poultry associations and private company advisors and consultants.

- **To always be responsive and effective**: Once set up the network members should be able to share information on their own experience, and benefit from that of others, at a lower resource cost to them than would be the case if they had to submit articles and take out subscriptions to professional journals.

- **To capitalize on the richness inherent in different regions**: Taking into account the diversity and differences in the stage of development of countries in Africa, the establishment of the APN cannot be a process in which those who are able to supply most resources (such as money and information) for the network are the ones who receive the most benefit from it. It must be a collaborative process working to support those who wish to develop solutions to difficult problems. The starting point for the development of coordinated and balanced design of the APN strategy for the region should be the knowledge of all the stakeholders with a role in the development of poultry production in the region. This includes the knowledge of existing poultry production facilities, extension and research facilities, staffing and explore the linkages between all sectors.



Africa Poultry Network (APN) of the World's Poultry Science Association

Draft APN Constitution: Structure and Content

Thomas Kaudia
Chair APN Steering Committee, Kenya

Special Foods International, 428-00606 , Sarit, Nairobi, Kenya

FINAL DRAFT CONSTITUTION OF THE AFRICA POULTRY NETWORK OF THE WORLD'S POULTRY SCIENCE ASSOCIATION

Article 1. Name

The name of this organization is the African Poultry Network (APN) of the World's Poultry Science Association (abbreviation: APN of the WPSA).

Article 2. Objectives

1. To promote the advancement and dissemination of knowledge in all aspects of Poultry Science and the Poultry Industry with particular reference to those countries embraced by the APN.

2. To promote education in the field of poultry science for students and extension services, and to facilitate exchanges between research, education and industry.

3. To operate predominantly as a virtual network using electronic means

4. To encourage co-ordination between the branches of the WPSA

5. To co-operate with other national and international organizations in achieving these aims.

Article 3: APN Membership

Open to people domicile in Africa and persons resident in countries which do not have yet a registered branch with WPSA'

Article 4. Structure of the APN

The affairs of the APN of the WPSA are to be managed by Management and Executive committee in collaboration with other committees namely; advisory, fund raising and consulting, auditing and knowledge management, positioning APN as a virtual organization.

1. Management committee (MC-APN)
2. Executive committee (EC-APN)
3. Advisory Committee (AC-APN)
4. Fund Raising and consulting committee (FR-APN)
5. Auditing committee (AUC-APN)
6. Knowledge management committee (KMC-APN)

Article 5. Management Committee (MC-APN)

Responsibilities of the MC include the following:

a. Position APN to deliver on its mandate by upholding the constitution and proposing new policies and regulations as may be necessary,
b. Support other committees to deliver on their mandates,
c. Promote the image of both APN and WPSA,
d. Work to promote poultry production efficient, competitive and safe in the designated region,
e. Ensure alignment of APN activities' to that of WPSA to enhance its image/presence in AFRICA

Article 6. Executive Committee (EC-APN)

The EC-APN comprises the positions of President, Treasurer, Secretary, Internal Auditor and Fundraiser all elected by APN MC through APN "e" poultry conference by secret ballot.

The EC shall hold office for a period ending at the close of the following APN "e" Poultry conference. The Officers may serve for another term of 3 years, but not more than 6 consecutive years.

The President must coordinate activities of the APN in accordance with this Constitution and preside over General Meetings.

The Treasurer is responsible for managing the funds of the network, professionally keeping all financial transaction records and receipts. The treasurer works closely with the Internal Auditor to make sure procurement processes are transparent, high quality and competitive.

The Secretary is responsible for compiling and updating the list of members and liaising with other committees to ensure that required information is collected, edited, packaged and disseminated to reach the intended target groups in a form that create satisfaction and value to the recipient.

The Internal Auditor works with all the committees to ensure that procurement processes are transparent and competitive.

The Fundraiser works in partnership with Management Committee and working groups to ensure budgeted funds are sourced from partners without compromising planned activities operations.

Article 7: The Advisory Committee (AC-APN)

The advisory committee comprises the position of:

- Scientific Advisor; who advises on planned scientific research,
- Development Advisor, advices on new tasks that APN can undertake to improve on its service delivery efficiency and effectiveness,
- Financial Advisor, will address areas that make APN financially efficient,
- ICT Advisor, will mentor APN management teams on how APN can use ICT to create competitive advantage,
- Gender and Public Relations Advisor will infuse modalities of enhancing gender equality in service delivery and productive efforts as well as ways of embodying and bonding the public to APN,

.Advisory committee members should be composed of intergovernmental representatives (FAO, AusAid for instance.) and WPSA members from non African countries.

Article 8: Fund Raising and Consulting (FR-APN)

All the members of the EC shall belong to the FR-APN.

Main responsibilities of the committee will be;

- Fund raising for:
  - Running the network,
  - Promoting WPSA activities and membership drive,
  - Project management and implementation,
  - Monitoring and evaluation activities,
  - Funding research,
  - Organizing conferences.
- Monitoring and evaluation of ongoing projects to ensure that activity budgets are adhered to.

Article 9: Auditing Committee (AUC-APN)

Main activities will be to scrutinize all procurements and use of Network Assets and resources. An external Auditor shall be appointed to audit the books before each general meeting.

Article 10: Knowledge Management Committee (KMC-APN)

The main responsibility will be;
To annually create knowledge depository by aggregating, consolidating, synthesizing and packaging data on poultry research, statistics, production, extension, processing and marketing for each country (that can be marketed online). Each branch shall have a website manager to work with the overall website manager to easy out the task of populating the site.

Article 11: Composition of Committee Members
Each committee shall have at least 30% and 20% women and youth representation respectively; each committee shall have representatives from;

- Academia (research and training),
- Value chain players (Production, extension, marketing, Quality control and Standardization)
- Government

Article 12: Meetings

General Meetings shall be held during APN "e" poultry conference every two years, Special general meetings may be held if ¾ of the members demand for such a meeting

The annual general meeting which is an "e" meeting shall be held not later than December 31 in general meeting year. Notice in writing of such general meeting, accompanied by the statement of accounts and the agenda for the meeting shall be sent to all members not less

than 21 days before the date of the meeting and, where possible, by press not less than 14 days before the date of the meeting. Notice of meetings can also be given by email, or SMS.

The agenda for any general meeting shall consist of the following:

a. Confirmation of the minutes of the previous general meeting.
b. The President's report,
c. The secretary's report,
d. The treasurer's report
e. Consideration of the accounts.
f. Election of the management committee, Executive Committee and other committees,
g. Appointment of Auditors and legal representatives.
h. Such other matters as the committee may decide or as to which notice shall have been given in writing by a member or members to the secretary at least four weeks before the date of the meeting.

a. A quorum at all General Meetings shall be two thirds of MC members registered
b. At all "e" General Meetings the President of the EC shall preside.
c. Proposals for inclusion in the agenda of the General Meeting shall be in the hands of the Secretary at least four weeks before the meeting. The final agenda will be approved by the EC before distribution.
d. Notice of General Meetings with the agenda shall be mailed to the members at least three weeks before the date fixed for the meeting.
e. At all meetings in case of a tied vote, the APN President shall cast a vote to break the tie.

Article 13: Amendments

Amendment to the constitution of APN must be approved by at least two-thirds majority of members at a general meeting.

Amendments cannot, however, be implemented without the prior consent in writing from the Attorney General's office where APN is legally registered obtained upon application to him made in writing and signed by the Executive Committee members.

Article 14: Inspection of Accounts and List of Members

The list of members and membership status shall be posted in the APN website by the website manager who will be a member of the Knowledge Management Committee.
Members can log to the site through a password.

Article 15: External Auditor

An external auditor shall be appointed for the following two years by the general meeting.
All the association's accounts records and documents shall be opened to the inspection of the external auditor at any time.

The Treasurer shall produce (internal auditor certified) an account of his receipts and payments and a statement of assets and liabilities made up to a date which shall not be less than six weeks and not more than three months before the date of the annual general meeting.
The external auditor shall examine such annual accounts and statements and either clarify that they are correct, duly vouched and in accordance with the law or report to the Executive Committee in what respect they are found to be incorrect, unvoiced or not in accordance with the law.

A copy of the auditor's report on the accounts and statements together with such accounts and statements shall be furnished to all members at the same time as the notice convening the annual general meeting is sent out. An auditor may be paid such honorarium for services as may be resolved by the general meeting appointing him.
External auditor shall not be an office bearer or a member of the committee of the network.

Article 16: Use of Funds

The funds of the network will be used for purposes outlined in the list of objectives through an approved activity budget. Use of miscellaneous funds must be approved by the Management Committee.

Article 17: Additional mandate of APN

APN shall have additional mandate to:

- Charge annual membership fee to WPSA branches and individuals,
- Raise funds through; sponsorship from industry, international NGOs, funding organizations, individuals, trusts, government departments and consulting,
- Purchase office stationary, electronic and general equipment,
- Hire a webmaster and secretary on time share basis,
- Second people to any committee when necessary,

Article 18: Impropriety

Any member or branch involved in actions / activities that construe impropriety shall be reported to the President and vetted by the Disciplinary Committee.

Article 19: Banking

The network main account shall always be located at the headquarters (residence country where the president resides) or in a country where transaction interests are favorable,

Article 20: Dissolution

APN shall not be dissolved except by a resolution passed by ¾ of members at a general meeting.

Intentions to dissolve APN shall be communicated to WPSA president 12 months in advance before the general meeting WPSA.

When it is deemed necessary to dissolve APN, all assets shall be liquidated by the Board of Trustees to offset liabilities.

Excess money after clearing liabilities shall be forwarded to WPSA account.

Annex 1.
APN Champions

1. Mr. Thomas Junne Kaudia (Kenya)
2. Dr. Harry Swatson (South Africa)
3. Dr. Rosa Costa (Mozambique)
4. Dr. Jean-Claude FOTZA (Cameroun)
5. Dr. Jack Tona (Togo)

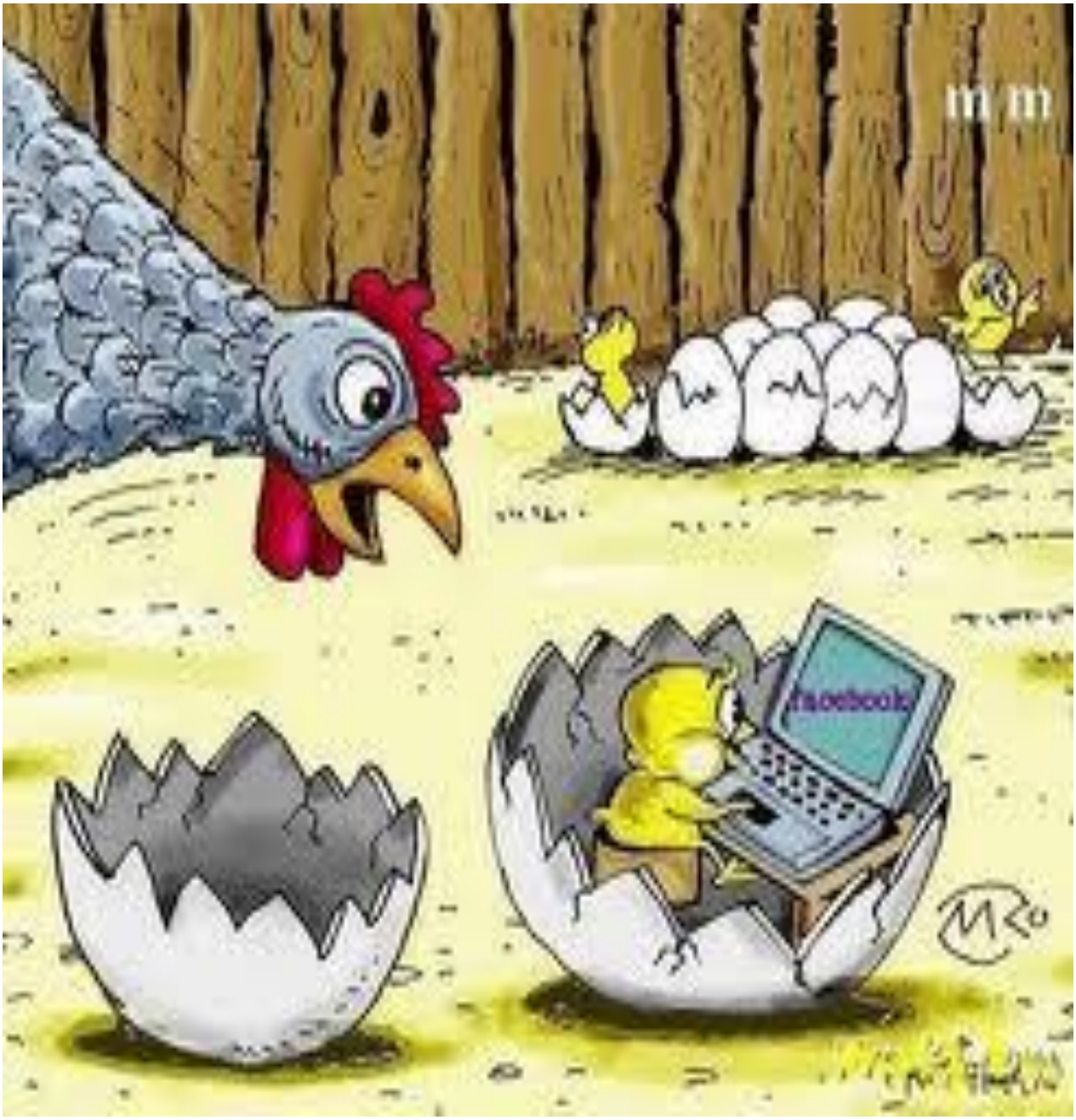
Advisory Committee:

1. Dr. Robert A. Pym,
2. Prof. Funso Sonaiya,
3. Prof. Rob Gous,
4. Prof. Comfort Acheampong,
5. Prof. Daisy Eruvbetine,
6. Prof. Uswege Minga,

Information Communication Technology Strategy for the African Poultry Network of the World Poultry Science Association

Harry Swatson
Member APN Steering Committee, South Africa

Cedara College of Agriculture, PB X6008, Hilton 3245, Kwazulu Natal, South Africa



1. Introduction

Information Communication Technologies (ICTs) refer to technologies that facilitate the creation, processing and transfer of information across space and time (Olaniyi, 2013). ICTs enable performing tasks quickly, efficiently and comprehensively, facilitating the flow of large volumes of information to a wide audience across numerous geographical locations. Though ICTs are not a solution or an answer to agricultural and rural development, they have the potential of bridging the information gap for rural farmers with respect to innovative practices, government policies, credit facilities, accessing markets and acting as an effective tool for policy advocacy. Information and Communication Technologies (ICT) are widely used by a large proportion of the society including various stakeholders engaged in the whole poultry value chain. ICT has been noted to bring with it excellent technical, cultural, socio-economic and political changes amongst poultry practitioners, farmers and various role-players in the whole poultry value chain. Akpolu (2001) noted that small and medium sized enterprises play an important role in economies of most African Countries. It was noted that in order to improve upon these enterprises especially poultry enterprises, improved poultry production techniques and information has to be disseminated to targeted groups and stakeholders with minimum delay.

2. What are some ICT tools and their applicability to achieving the objectives of the APN?

ICT tools consists of but are not limited to computer hardware, software, internet, other communication networks and media used to collect, store, process and transmit information in the form of voice, text, data and images. For instance, the radio, internet, telephone (fixed and mobile), television, computers, newspapers, camera, cam-record (videos) and farmer magazines. There is thus a broad possibility for the application of ICT by the African Poultry Network to achieve its objectives. This can follow a similar format making use of a website and a host of resources as illustrated in the figure below.

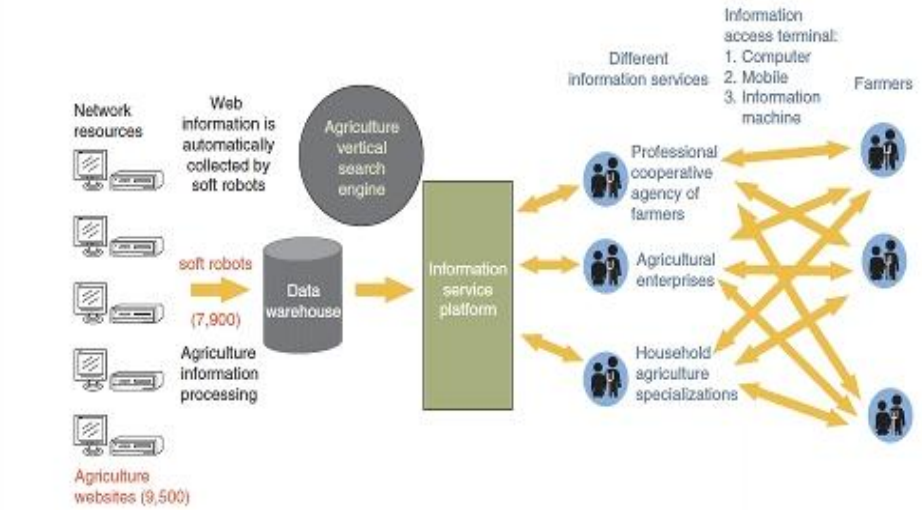


Figure 1. An illustration of the use of ICT in Agriculture (www.ictinagriculture.org/sourcebook/...)

The extent of ICT use by members of the APN could range from the use of computer applications, the internet, geographical information systems, cell phones as well as mainstream media such as Radio, television and newspaper. Information and communication technology (ICT) can help farmers or poultry practitioners by improving access to essential information, for example, about poultry diseases and their treatment, combating parasites, poultry selection and breeding, nutrition, laying nests, refrigeration and preservation

(Porterfield, 2006) and value adding activities along the whole value chain. Figure 2, provides some challenges that poultry farmers or poultry development workers will have to access information on in order to make the right decisions thus optimizing the use of limited resources. The APN website when adequately populated could be a source of some of these required resources. This could also be achieved through APN facilitated poultry related activities such as workshops and e-conferences.

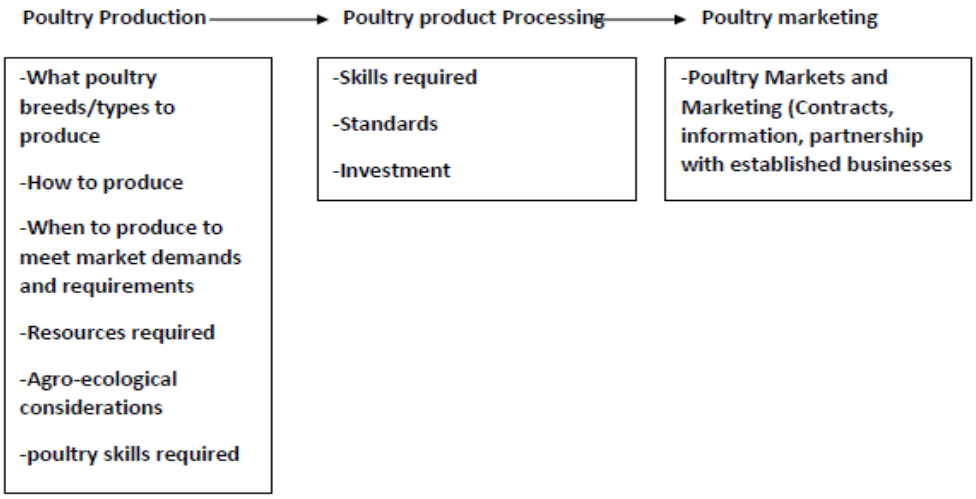


Fig 2. Some challenges facing poultry farmers or stakeholders

3. The information, communication and technology strategy for the APN

A participatory approach is used in developing and populating the website. This allows for discarding inappropriate inputs early in the development of the website or uploading information. The information structure used for the website comprises of a web platform that is used to gather information on best poultry production practises, innovative research and training resources. These are then adapted to meet the needs of various target groups who are members of the APN. The platform will also be open for use by other individuals or poultry practitioners/farmers to obtain and disseminate relevant information to groups or peers with whom they work to enhance their poultry production activities.

Benefits of the platform

- ✓ Encouraging sharing of poultry knowledge and real practical experience;
- ✓ Promoting poultry skills empowerment of poultry practitioners using modern ICT resources;
- ✓ Provide a pool of agricultural, cultural and socio-economic knowledge and skills for making better informed decisions on the use of poultry as a tool in poverty reduction;
- ✓ Job creation in the poultry industry and transfer of poultry production skills along the whole poultry value chain

4. The information dissemination initiative

For all future APN website resources to be uploaded a phased strategy is developed in conjunction with relevant stakeholders or the Champions or steering committee, this will involve:

(i) *Diagnosis*: the identification of APN objectives, needs, opportunities and constraints;
(ii) *Planning*: the establishment of priorities and strategies that will provide solutions or will capitalize on opportunities;
(iii) Comparative evaluation of webpage development options;
(iv) *Validation/adaptation*: the information obtained from relevant stakeholders (i.e. APN/WPSA members, farmers, students, poultry research institutions, businesses and development organizations) including the communities are modified as necessary to suit local conditions in targeted areas;
(v) *Monitoring/Evaluation*: the adoption and adaptation process together with constraints to adoption are carefully monitored and evaluated.

In order to satisfactorily implement the website activities on a participatory basis, it is necessary that a special relationship of confidence, trust and mutual respect be developed among all stakeholders especially APN/WPSA members. The information exchange relationships among stakeholders are depicted in Figure 3. The main groups considered are: poultry farmers; Research and Development Agents (R&D agents); Support Services (Vets, Agricultural scientists & Agricultural Extension workers); Micro Credit Institutions; local and International donor communities and poultry feed and pharmaceutical companies. In seeking to reinforce website related inputs and implement APN activities the following participatory steps originally suggested by Pound *et al*. (1998) will be followed:

(i) Problem identification based on poultry stakeholders point of view, ways of explanation and a move towards action; there will be more listening and dialogue; recognition of the difference and diversity of social groups involved in poultry production will be taken into account (i.e. different social groups have different interests and experience based on gender, wealth, status and ethnicity).
(ii) Problem/constraint ranking of poultry production in targeted member APN/WPSA countries: an investigation into the nature of the constraints will be made through semi-structured interviews, transect walks/direct observation and social mapping. An identification of the causes, root causes and effects of constraints will be made. Root causes of poor productivity of due to the lack of knowledge of poultry husbandry, diseases, and lack of access to micro-credit will be examined based on various county requirements or needs. These could then be documented. Recommendations and good practises will be made available on the webpage.
(iii) Identification of possible solutions: improved knowledge, access to inputs and micro-credit.

The information gathered in the above processes will be stored by the African poultry resource centre, which will serve as a hub for gathering and processing information from other stakeholders, and making recommendations available timeously to all stakeholders.

- ✓ R & D agents will be involved in conducting research (i.e. on-farm) and analysing information about poultry development in Africa. This information will then be disseminated throughout the APN to relevant poultry stakeholders.
- ✓ Poultry development related policy makers: may provide APN with policy documents and regulations and they can also follow up with poultry development work in African countries.
- ✓ Support Services (Poultry training providers, Vets & Agric. Extension): collaboration between these poultry service providers and the poultry information resource centre will facilitate training and targeted information dissemination.

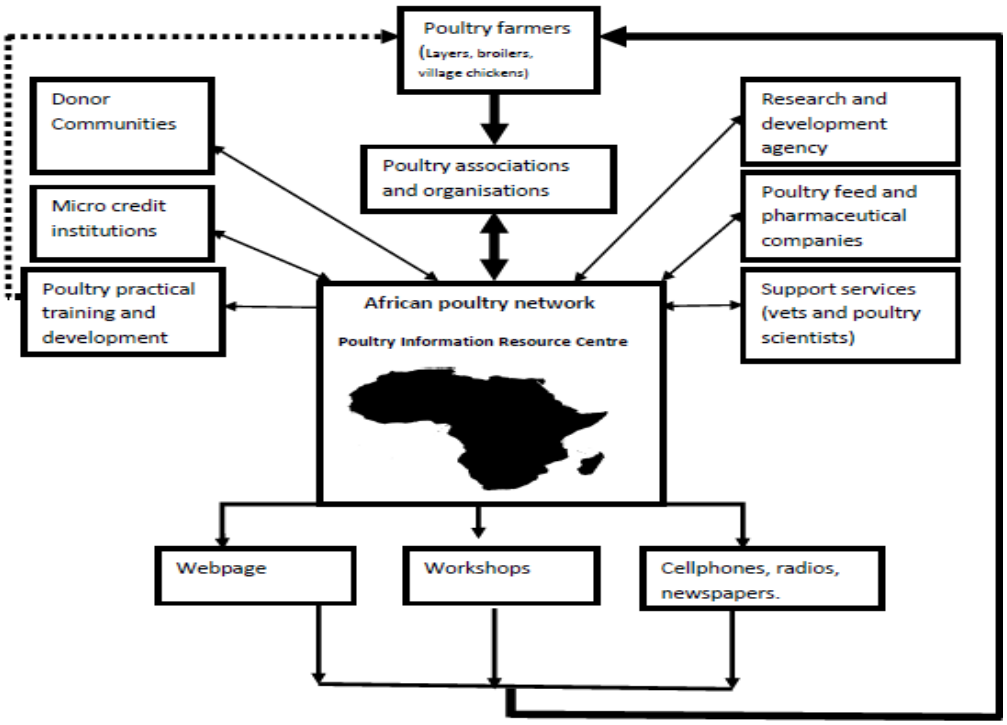


Figure 3. An information, communication and technology strategy for the APN

5. Recommendations for the APN website development initiative

The webpage will extend the reach of ICT to poultry scientists, practitioners, students and farmers with a wide range of abilities, resources and from a diverse political, socio-economic, technical background. Action recommendations required to achieve this includes but is not limited to

(i) Determination of the broad context, needs of poultry scientists, practitioners, students and farmers

(ii) Initiating an awareness campaign amongst APN/WPSA and non-APN members

(iii) Encourage poultry education and the exchange of scientific and technological information amongst various stakeholders in Africa and globally.

(iv) Ensuring funding mechanism for website is sustainable

(v) The website to provide a strategic blend of information along the whole poultry value chain based on innovative research applicable for the African environment, whilst optimising the use of scarce resources

(vi) Establishing a system of incentives and support for all contributors to the website is to be established, together with follow up support for all contributors

(vii) Members are required to gather, organise, provide access to, share poultry data and resources on various relevant poultry activities

(viii) An efficient clearing house system to be put in place to assist in gathering , editing, censoring poultry an d poultry related information before distribution to various stakeholders or the poultry audience

(ix) Setting up and supporting a technical implementation/monitoring and evaluation team to carry out key functions that will advance the website

In concluding, the website should be able to provide a good dose of up-to-date poultry and poultry related information along the whole poultry value chain to the public. This will make good poultry value adding business sense!!!!!

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OVERVIEW OF POULTRY PRODUCTION IN SUBSAHARAN AFRICA: SMALL SCALE FAMILY PRODUCTION[1]

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ABSTRACT

Small scale family poultry are local poultry kept in rural households. In Sub-Saharan Africa, family poultry make up to 80% of poultry population while commercial poultry are about 20%. Over 90% of poultry in Sub-Saharan African countries are chickens. Family poultry production is characterized by low input and low output and by traditional extensive husbandry practices with limited health care given by the farmer. Poultry population per household varies between 5 and 20. Chick mortality is over 50%. Hens lay eggs in three to four clutches and produce an average of 40 to 60 eggs per year. Family poultry play very important socio-economic, food security and nutritional roles in rural households and hence are a very crucial asset in rural households. Local poultry are hardy and relatively resilient to the rather harsh environment which prevails in rural areas. Family poultry eggs and meat are popular among both urban and rural inhabitants due to their perceived better taste compared to commercial poultry, and hence have ready market in urban and peri-urban areas. However challenges are many and include losses due to diseases, low productivity, traditional husbandry practices and low biosecurity. The other challenges are that resistance to diseases is relative and not absolute and that there is lack of extension packages specific for family poultry. The importation of cheap poultry and poultry products and non favourable policies are a threat to family poultry. There are prospects and a bright future for family poultry so long as there is rural poverty. Family poultry must be promoted because of their socio-economic and nutritional importance in rural areas. There is need to support family poultry and advocate for positive policy changes, training farmers in improved husbandry practices and advocacy for increased investments in family poultry by farmers. Efforts ought to be enhanced in the control of losses, especially those due to infectious diseases such as Newcastle disease. There is need and room for genetic improvement and efforts must be made in that direction.

INTRODUCTION

In Sub-Saharan Africa (SSA), family poultry is very important culturally, nutritionally and economically. Family poultry has had various designations over time, namely, smallholder family poultry, Rural poultry, Village chickens, Local poultry, Local chicken, Free Range poultry, Indigenous chickens, Native chickens and Scavenging chickens. In this paper the term family poultry and local chicken will be used to mean poultry/chickens which are kept by households on free range. Family poultry in Sub-Saharan Africa is mainly chickens (*Gallus gallus domesticus*) and the other birds, such ducks and turkeys are kept in small numbers and their population is less than 10% of family poultry. Family poultry make up to 80% of poultry in Africa while population of commercial poultry is 20% (Besbes, 2009; Akinola and Essien, 2011, Magothe *et al.* 2012). Close to 85% of households in SSA keep family poultry.

Family poultry are kept on free range, rarely are they kept semi-intensively which may happen during early parts of the crop growing season. The biosecurity in this traditional free range husbandry system is low and hence occurrence of disease outbreak is common, especially Newcastle Disease. Hence Family poultry are classified as belonging to Sector 4 of FAO classification. The traditional husbandry is the low input and low output type with very little being invested by the farmer be it in form of shelter, feeds or medication. As a result the chickens are small in size reaching an adult weight of 1.5 to 1.9kg and mature by 24 weeks of age. The egg size is small egg weight, 35 t0 45 grams. Age at first egg varies from 24 to 34 weeks (Besbes, 2009; Akinola and Essien, 2011, Magothe *et al*. 2012). Local hens produce 40 to 60 eggs per year in three to fourth clutches (Akinola and Essien, 2011). The low productivity may be said to match the limited feed resources and also the health challenges and traditional husbandry.

Family poultry are genetically diverse and hence the observable phenotypes are designated as ecotypes rather than breeds because the geographical separation usually leads to closed breeding and hence creating phenotypic resemblances among family poultry of a given locality and hence termed as ecotypes rather than breeds.

The ownership, decision making and care of family poultry varies from one society to another. In most societies, such poultry re owned by the family, but decision for their disposal is in most cases made by the husband while feeding and cleaning are mainly done by wives/women and children (Mtileni, *et al*, 2012). Shelters are built by men although in some few cases the women play a part. The flock size per household varies from 5 or less to 20 with an average of close to 12. Separate chicken shelter is rarely provided but rather poultry share the same living quarters and kitchens of the farmer or owner. The shelters are used as night shelters.

It is estimated that in Africa there are 1,356 million chickens, 16 million ducks, 9 million turkeys and 12 million geese and Guinea fowls. In East Africa, there are 152 million poultry, mainly chickens. Annual poultry production in SSA is estimated at 3,257,292 Metric Tons (MT) chicken meat, 2,180,125 MT hen eggs and 7,143 MT of other poultry eggs (FAO Statistics, 2005).

Family poultry are very important in the socio-cultural fabric of the rural people of the developing world including Africa (Alders and Pym, 2009). The cultural roles include their use in making sacrifices to appease the supernatural powers, they are used in healing, in sorcery and when paying fines and dowry and as gifts. In some societies local chicken are highly valued and are cooked and offered as meals for special guests. Family poultry are environmentally friendly; they do not require large tracts of land to raise them unlike the larger livestock such as goats and cattle. The local chicken is a very good scavenger and scavenges food and grain left-overs, it scavenges on insects some of which may transmit human disease.

The local chicken serves as small change to meet family small financial needs such as money to buy sugar, salt, pay school fees or buy school uniforms for children. There are wider economic benefits beyond family, the value chain of family poultry is extensive and includes the farmer, trader/vendor, transporter, urban markets and the urban consumers (Bignol, 2009). The chicken products traded are meat, eggs, live birds and manure. There is cross border trade involving family poultry, especially chickens.

Family poultry are thus economically important and they play a vital role in capital accumulation and poverty alleviation. The contribution to household food security and as a source of rich animal protein cannot be underestimated.

OPPORTUNITIES

Family poultry offers many opportunities which, if tapped would be of great benefit to the rural poor. In as much as one might argue that there could be alternative approaches to fighting poverty among the rural poor, family poultry offers a ready opportunity because it is part of the SSA family tradition, most households keep family poultry, the total population is large, local chickens are hardy and not easily wiped out diseases and appear to be well adapted to the environment and to the traditional low input extensive husbandry practices. Family poultry offers commercialization opportunities for the low income rural people.

Family poultry meat, eggs and live birds have a ready market in urban and peri-urban areas where there is better income. Family poultry and products meet over 90% of the meat and egg needs in rural areas and in most, if not all small towns where there are no commercial chickens (Besbes, 2009). Local chickens are preferred to commercial ones because of their perceived better taste. Preference for live rather than refrigerated and frozen poultry and the tradition of cooking chicken by boiling, give local chicken an edge over the commercial chickens.

Family poultry is genetically diverse and this offers an opportunity for genetic improvement of the local as well as commercial chickens. Unlike some of the livestock, there are no taboos associated with family poultry in SSA. Replacement of stock for family poultry is from local sources unlike the commercial chickens. Local hens are good egg incubators and hatchers and hence there is no need for the use of costly incubators, hatchers and brooders. Local chicken scavenge for own food which reduces feed costs which are account for close to 70% of production costs of the commercial chickens. Unlike commercial poultry, family poultry do not compete with humans for grains. Instead they scavenge and convert waste and other feed sources into useful nutrients such as spoilt and broken grains, kitchen leftovers, vegetation, insects and snails (Abouelezz *et al*; 2012).

Family poultry are not labour intensive and hence members of a household, especially women are able and free to engage in other activities such as agriculture and petty businesses without jeopardizing the family poultry business and hence are suitable for mixed farming. Similarly they can support HIV/AIDS mitigation among victims. Family poultry can and is used for income generation and fight poverty and also empower women economically.

In order to control poultry losses through diseases and poor husbandry, a household requires very little inputs. The farmer will need a few vaccines, a simple shelter and rarely, some limited therapeutics to control losses. A farmer requires just a small input in order to increase production. For instance a farmer can use rice husk as an incubator, and hay-sack brooder for raising of chicks. Such interventions will cut down the time it takes for hens to incubate eggs, hatch, brood and wean chicks, from 130 days to 60 days (Sarkar and Golam, 2009).

CHALLENGES:

One of the biggest challenges facing the family poultry is losses, especially during chick-hood. Losses range from 50% to 100% before a chick is weaned. Losses are mainly due to diseases, especially Newcastle disease (Roy, 2009), poor husbandry practices, predators such as snakes, rats, dogs, cats, foxes, raccoons, birds of prey as well as theft (Bell, 2009). Newcastle disease among unvaccinated local chickens occurs seasonally and may cause up to 100% mortality (Nwanta, *et al*, 2008). The genetic potential for productivity is low compared to the commercial layers and broilers. The low genetic potential limits the level of improvement in productivity by improved husbandry alone.

Unscrupulous family poultry traders can be a disincentive towards raising of family poultry because of the low prices offered to farmers (Mlozi, *et al*., 2003).

The efficacy of traditional methods of intervention to stem losses due to diseases is doubtful, for instance, traditional therapies do not seem to be effective especially against Newcastle disease which is the major disease causing high losses among local chickens.

It can be stated that so long as poverty prevails, especially in rural areas, family poultry will remain important sources of quality animal protein, income and also fulfill socio-cultural roles. However with improvement in income, continuing urban migration and modernization, importation of cheaper commercial broiler meat and eggs, convenience and future preference for frozen poultry meat and change in cooking and eating habits will make family poultry of less importance and relevance in the future. All the same, the changes will be gradual and will take a long time.

This calls for support of the family poultry industry until the above stated changes occur. The support which is advocated here is the training of farmers in improved family poultry management practices, improvement of rural road network to access lucrative urban markets, production and availability of extension materials to rural people especially the women. Training of community health workers and farmers on methods of disease prevention and control, there are no local breeds which are disease resistant. It has been proved that that there is no absolute resistance to diseases. Disease resistance is controlled by multiple genes which are located in the Major Histocompatibilty Complex – MHC. Hence it is difficult to selectively breed for resistance. However, it has been shown that the B-complex genetic cluster on Chromosome 16 has resistance genes against Marek's Disease, Coccidiosis and Fowl cholera. It has also been shown that IFN (Interferon) genes show resistance to viruses, the Mx genes against Avian Influenza and IBDV. Such disease resistance is not absolute. Besides, there is negative correlation between selection for disease resistance and selection for traits of economic importance (Jie and Liu, 2011).

THE WAY FORWARD FOR FAMILY POULTRY

As earlier stated, as long as there is poverty, family poultry will thrive, especially in rural areas of SSA. There is therefore need for formulation of more conducive national policies which promote family poultry. That such poultry must be recognized as an important component of a country's livestock industry which deserves to be promoted and supported. Training of extension workers and farmers on improved husbandry practices including disease prevention and control skills, must be promoted. Governments must establish breeding centres for local chicken ecotypes which have been shown to have preferred production traits, some governments such as Kenya have shown the way and hence other governments should follow suit. However, Pym (2009) doubts if improved family poultry production augurs well with applicability and sustainability. It is believed that if planned and handled appropriately, improved family poultry production is possible and sustainable. Guerne Bleich, *et al*., (2009) argue that in order to have a positive impact, improvements of family poultry especially the backyard poultry, the whole value chain must be well understood.

The more advanced farmers who are willing to make some investments on local chickens may be introduced to the more advanced husbandry practices such as the backyard system for improved productivity and reduced chicken losses, especially the chicks. The first priority must be reduction of losses followed by increased productivity and marketing (Sonaiya, 2009). In conclusion, family poultry play important roles in the social fabric of the rural societies in SSA and will continue to be important so long as there is poverty, especially in rural areas. The need to support family poultry is advocated in this paper.

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Overview of poultry research activity and capability in sub-Saharan Africa

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1. Introduction

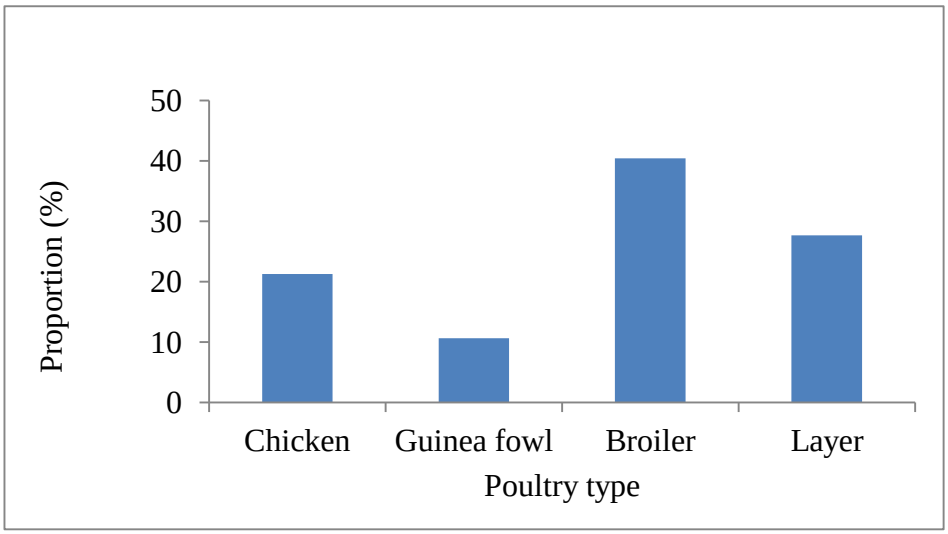
It is well known that poultry products are an important constituent of human diet and are consumed worldwide with no religious restrictions, providing all essential nutrients, except calcium, in an almost perfect balance for human beings. In the last twenty years, the world egg production has dramatically increased (+78%) to reach 1,140 billion eggs (61 million tons; FAO, 2008) and has, with poultry meat production, contributed to the most important increase in the protein coverage needs for the world population. The main part of the world growth (70%) originated from Asian countries (China and India), which now represent 59 % of world egg production. In contrast, in Africa, the world's second largest populated continent, egg production rose by 29% (2.2% per annum). In Africa, the yearly per capita egg consumption in 2007 was only 45 eggs, which is significantly lower than the world average of 145 eggs. Consequently, sub-Saharan Africa countries are often facing shortcomings of quality meat and eggs. Often, chicken meat, eggs and egg products have to be imported from overseas. This makes egg prices highly variable. The causes for these shortages of eggs are multiple, but main causes are that knowledge on exotic poultry production adapted for the sub-Saharan Africa countries and the number of well-trained poultry production experts is very limited. Indeed, few relevant studies on adapted poultry management practices as well as poultry science have been done. In addition, poultry industry is facing constraints including lack of access to markets, goods and services, weak institutions and appropriate technologies. Furthermore, scientific information about feeding, management practices, diseases control, etc. on poultry production performances is scarce. Although factors such as feeding, diseases control, incubation conditions are universal, fine tuning has to be learned in practice and adapted in order to improve productivity for the given circumstances and the goals to be reached (e.g. chick robustness is also dependent on incubation history). This overview focuses on the scope of poultry research activity underway in sub-Saharan Africa, and to identify possible ways in which this can be strengthened by an effective poultry network. It will point especially to different aspects of poultry science. The emphasis was put on research activity underway during 2010 and 2013 especially research papers.

2. Scope of poultry research activity underway

Very limited number of papers from sub-Saharan Africa countries has been published in high impact poultry science journals such as Poultry Science, British Poultry Science, etc. But, International Network of Family Poultry Development journal and International Poultry Science Journal recorded high number of relevant publications from Africa. Most of these publications are related to village chicken. Also, feeding, housing, management practices, crossing local chicken with exotic bred, mix farming and etc. are the major topics with regard to commercial poultry. Village chickens include mainly chicken, guinea fowl. Commercial poultry research activity concerns broiler and layer chickens. Figure 1 indicates that exotic poultry retained more attention with at least 57% of research papers. For indigenous poultry

only half of research activity point to guinea fowl. Research activity on broiler chicken retains more attention probably because very short lifespan of these chickens.

Figure 1. Proportion of research activity in relation to poultry type



Source: calculated from 75 published papers in different journals (Tona, 2013)

Several scientific domains are concerned by the research activity. These include 1) environment and management, 2) feeding: techniques, alternatives and innovation, 3) metabolism and nutrition: nutrition (local resources, feed additives, vitamins and minerals, amino acids, enzymes, antitoxins, etc.), 4) physiology, endocrinology and reproduction (incubation), 5) processing, products, and food safety, 6) behavior and well-being, 7) extension and instruction, 8) genetics, 9) poultry health: immunology, pathology, and 10) socio-economy. These thematic can be investigated alone or in combination of some of them up to three different domains. Table 1 indicates that feeding represents the major proportion of poultry research activity while behaviour and welfare as well as nutrition and metabolism retained very little attention.

Table 1. Proportion of research activity according scientific domains

Domain	Proportion (%)	With combination
Environment and Management	11.73	18.52
Feeding: techniques, alternatives and innovation	29.01	42.59
Metabolism and Nutrition: Nutrition	1.85	1.85
Physiology, Endocrinology and Reproduction (Incubation)	23.46	29.63
Behavior and Well-Being	1.85	1.85
Genetics	5.56	7.41
Poultry health: Immunology, Pathology	12.04	14.81
Processing, Products, and Food Safety	8.95	16.67
Socio-economy	5.56	5.56

2.1. Environment and management

With regard to environmental and management, investigations run point to feeding time management or incorporation of local feedstuffs in feed rations in interaction with environmental temperature and their effects on broiler performance (Dei et al., 2012; Majekodunmi et al., 2102 and Kwari et al. 2012, Hancock et al. 2012). The influence of free-range practices on poultry health in term of disease control, mortality or immunity levels are under investigation (Dakpogan et al. 2011; Wachira et al. 2012 and Nusirat et al. 2012). Molting as a tool of prolongation of economical lifespan of layer chickens and delay in feed access of day-old chick that can be due to transportation time during importation were also investigated (Tona et al., in press). In addition, effects of environmental interaction with genotype on growth performance were studied by Lwelamira (2012).

2.2. Feed: techniques, innovation and alternatives

Mainly studies concerning feed are related to performances parameters. Several studies focus on the effects of incorporation of feed additives such as enzyme (Ademola et al. 2012) on production performance. Also, feed supplementation with vitamin and mineral premixes (Ogunwole et al. 2012), Electrolytes and Ascorbic Acid (Majekodunmi et al. 2012) have been studied. Investigation about incorporation levels of different feedstuffs locally available such as Dehulled Legume Grains (Dousa et al., 2012), Palm Kernel Meal (Bello et al. 2012), *Lablab purpureus* Seeds (Ragab et al. 2012), Garlic and Ginger (Ademola et al. 2012; Bamidele and Adejumo, 2012 and Lawal et al. 2012) Crayfish Waste Meal (Asafa et al., 2012), Chick Pea (*Cicer arietinum* L.) Seeds (Tamador et al. 2012) retained more attention. In the same line, investigation on incorporation of local plant products with possibly probiotic activity is spreading. For instance, *Moringa oleifera* Leaves are included in feed rations in order to evaluate their effects on productions parameters, resistance to diseases, feed transit, etc. (Teteh et al., 2012; Gadzirayi et al. 2012). Incoporation of local feedstuffs needs the determination of their nutritive values. This aspect is studying by Babiker (2012). Substitution or replacing of high cost feedstuffs by low costs feedstuffs have been studied. Kwari et al. (2012), Nobo et al. (2012) and Meseret et al. (2012) studied the effects of replacing brewery dried yeast by peanut seed cake; maize by low tannin sorghum on production parameters or fishmeal by phane (Imbrasia belina) meal. In addition, innovative feeding strategies are ongoing such as effects of wet feeding on guinea fowl performance (Dei et al., 2012), use of tannin-rich feed materials (Medugu et al. 2012). With regard to climatic conditions (season), the effects of feed macronutrient levels (low or high levels of protein or energy) have been also investigated (Teteh et al. 2010; Rashid et al. 2012 and Mohamed et al. 2012). In the same line, investigation on sequential feeding treatment combining high energy diet in the morning and beginning of the afternoon and the high protein and mineral diet in the late afternoon and early morning is ongoing (Dolores et al., unpublished).

2.3. Metabolism and Nutrition

Very few research activities focus on metabolism and nutrition. Indeed from our survey only Asafa et al. (2012) studied nutrient retention when incorporating crayfish waste meal in broiler feed ration. Such study should be done on regular basis since we are incorporating local feedstuffs which are not conventional feed ingredients in poultry ration. Not only, performance parameters need to be studied but how these new ingredients affect animal physiology and even more gene expressing that is molecular biology aspects. Moreover the

level of theses ingredients with regard to their toxicity and presence of anti-nutritional factors should be determined.

2.4. Physiology, Endocrinology and Reproduction

From our survey three major research activities can be distinguished. These include blood parameters and organ growth (weights), endocrinology, and incubation and reproduction. Mostly, the blood parameters studied are triglycerides, glucose, total proteins and haematological parameters. In general, it is the effects of feeding treatments on blood parameters that have studied (Mohamed et al. 2012; Teteh et al., 2010, Ademola et al., 2012; Bamidele Adejumo, 2012; Tamador et al., 2012). Very few studies have been done on endocrinology. Indeed, from our survey only Kagya-Agyemang et al. (2012) investigated on endocrine and neuroendocrine control of broodiness in the hens. Besides breeding system end reproductive of indigenous chickens (Meseret et al., 2012) a number of studies about incubation conditions, embryo growth trajectory according to genotype, relationship between embryo parameters and post-hatch performance have been done and are still ongoing (Tona et al., 2010, 2011, 2013, in press).

2.5. Behaviour and Well-Being

Very few research activities focus on metabolism and nutrition. Indeed from our survey, only Dei et al. (2012) reported the effect of pinioning on behaviour of guinea fowl. Because climatic conditions in the tropics are not adequate for intensive production of eggs and poultry meat, research activity should address animal behaviour and well-being.

2.6. Genetics

In general, research activity related to poultry genetics investigates the relationship between phenotypic characteristics of indigenous chicken and production parameters (Udo et al., 2012; Ige et al., 2012 and Ngeno et al., 2012). Further studies are needed for selection of indigenous poultry in order to decrease juvenile mortality and to improve growth and reproduction parameters. With regard to commercial poultry, Tona et al. (2010, 2013 and 2013 in press) reported embryonic differential growth trajectory according to chicken genotype. For commercial poultry meat production, genotype is imported indicating that they could be not or less adapted to sub-Saharan conditions. Hence, their productivity level might be negatively affected. Therefore, it is important to design comparative studies in order to identify poultry lines or strains that can perform better.

2.7. Poultry health: Immunology, Pathology

Mostly, research activity related to poultry health points to the state of the art and the prevalence of gastro-intestinal parasites (Dougnon et al., 2012; Sylla t al., 2011 and Ogbaje et al., 2012). Also, Lombo et al. (2012) reported three different methods of disease prevention in guinea fowl during juvenile life. Investigations on biosecurity and health management practices (Nusirat et al., 2012 and Ameji et al., 2012) and immune response of heat stressed broiler (Hind et al., 2012) have been studied. With regard to the use of plant products with possibly probiotics activity research activity could be design to evaluate the effects of such products, not only on production parameters, but also on disease control and immunity responsiveness.

2.8. Processing, Products, and Food Safety

Management practices, such feeding and especially diseases control, of poultry production in sub-Saharan Africa might have high repercussion on egg and poultry meat quality. Toan et al. (2013) reported excessive sue of antimicrobial drugs for diseases control in commercial poultry. Indeed, Omeiza et al. (2012) reported presence of antimicrobial drug residues in commercial eggs. Such study needs to be design on regular basis not only eggs but also for commercial poultry meat. In addition, comparison of egg quality and poultry carcass between feeding treatments (Meseret et al., 2012; bello et al., 2012; Majekodunmi et al., 2012 and Ragab et al., 2012) or genotype (Udo et al., 2012 and Binda et al., 2012) have been investigated.

2.9. Socio-economy

Socio-economy research activity retains very little attention. Bamiro et al. (2012) described the economics of horizontal integration in poultry industry. Traditional poultry supply and marketing have been largely developed by Issa et al. (2012). There is no information about accounting model for poultry industry in sub-Saharan Africa. Also, information concerning profitability is scarce. However, with the new dynamic of incorporating local feedstuffs and non-conventional feedstuffs in poultry rations, adaptation of appropriated technologies in order to improve poultry industry, such studies could be some important tools for decision.

3. Challenges

Up to 30% of fresh laid eggs can be downgraded throughout the 70 weeks of egg laying depending on hen physiology, environment, malnutrition and mismanagement of hens (Nys, 2010). The very high feed efficiency of conversion of layer diets which is mainly composed of raw vegetable material into animal proteins of high biological value is a real metabolic challenge. Appropriate management of diet is thus a true challenge for keeping high egg quality and is currently well controlled Due to competition for nutrient between man and animal, availability of feedstuffs for poultry remains the limiting factor of egg productivity. In addition, high variability in composition or presence of contaminants (mycotoxins) impairs egg quality. Using local feedstuffs is a way to secure the supply of food and limit transportation. It requires however a fast method to evaluate.

With the aim to promote and develop poultry industry in sub-Saharan Africa and its competiveness, collaborative research between APN members would carried out to increase food security by increasing the amount of poultry products available for human consumption. In this frame work, research activity should focus on different topics such as:

Artificial moulting: since artificial moulting is less or not even common practiced in West Africa, different adapted moulting programs in order to increase economic lifespan of a laying flock of hens as well as improvement of egg quality should be tested. In this context, artificial moulting proved to be an undeniable key factor for success and its application will depend on a number of estimated price factors, i.e. egg, feed-, day-old chick-, pullet-, and reform hen price.

Relationship between poultry management practices, production performance and product quality: Especially, research activities will be carried out on tow important aspects i) egg and meat production level and ii) egg fertility and hatchability for breeders. This second aspect may be related to male chicken management and sex ratio.

Reproduction and incubation: Emphasis should be put on pre-incubation conditions such as feeding and physical management of layer/broiler breeders. Also hatching egg quality as well as incubation conditions, hatching performance and chick quality should be widely investigated.

Socio-economy: The fundamental question would be to know whether the poultry activity is conducted to supplement rural households' income from food cropping activities. It is often understood that this line of activity is perceived as saving instrument with assets considered as quasi-money with rather higher return ratios compared to the modern saving instruments. As a research topic, it is important to conduct investigations to determine the perception of household members, in particular women, in the proposed course to impute to poultry production, with an aim of alleviating poverty in the rural area.

C***rossing exotic cock with indigenous hen***: investigations about introduction of exotic cock in village backyard and its implication in terms of phenotype, genotype and behavioural aspects will be carried out.

Innovative feeding: several alternative feeding systems will be tested to use local feedstuffs: sequential feeding, supplying energy in the morning and protein and calcium in the afternoon or mixed feeding of the ungrounded feedstuffs. Also, effects of incorporating a large amount of local feed components as well as plant products with possible antimicrobial or probiotic activity on production performance and products quality should be studied.

Thermotolerance and thermoregulation ability: due to sub-Saharan African climatic conditions in combination of irreversible climatic change, investigations on thermotolerance ability of different poultry type are needed. Research activity should be design to test different system of heat challenge during incubation as well as during post-hatch growth.

Processing and food safety: research activity about quality assurance of feed/food as well as poultry products (eggs, meat), poultry farm biosecurity and biosafety and poultry product processing and preservation should retain high attention.
Scientific disciplines such as physiology and endocrinology, metabolism, molecular biology, etc. are needed to explain the results from the research activities.

4. APN as a tool of strengthening and a channel of dissemination

APN should be technical and scientific framework of poultry research and dissemination of research output through Africa. For this role, apart from high-profile international conferences, APN should establish many working groups that will cover various aspects of poultry science and technology. It is suggested to form x working groups including 1) feeding, nutrition and metabolism, 2) incubation, fertility and reproduction, 3) Environment, management and climatic change, 4) socio-economy of poultry industry, 5) commercial poultry and 6) family poultry. Each working group should include researcher as well as professional. The meeting of these working groups should be planed on regular basis. During the meetings, research results should be presented and research activity underway and new research topics should be discussed. In order to boost poultry industry through research output, APN congress should be organized every two years. Moreover, organization of at least 2 two study days per year should be encouraged in each member country focusing on specific challenge in the country.

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Dolores I. Batonon[1,5]*, Maxime Traineau[1,3]*, Isabelle Bouvarel[2], Lucien Roffidal[3], and Philippe. Lescoat[1,4] Capacity of laying hens in sequential feeding, with contrasted temperatures, to adjust their feed consumption when offered previously a nutritionally unbalanced diet

THE CURRENT SITUATION AND ROLE OF APN IN EDUCATION, TRAINING AND CAPACITY BUILDING

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01.ROLE OF WPSA IN EDUCATION

WPSA as we all know is an organization that strives to advance knowledge and understanding of all aspects of Poultry Science and the Poultry Industry. Thus currently all the (79) branches and federation of branches (2) through there members are actively dedicated towards the spread of knowledge, training and education which is the backbone of the association. This dissemination of information and training is achieved by various ways. The hosting of WPC every four years is an occasion whereby all interested members come together and discuss their own findings and innovations in the industry at a global gathering. The federation branches carry out similar activities at a regional level while the individual branches operate at a country level. However each segment is not limited to its own members but is open to anybody interested in participating. This global spread of information provides a very wide coverage of the science and educates many people from all over the world on the latest developments in Poultry Science. The off shoot of the publications in terms of proceedings and other related material is a reference point for many Researchers to continue in their path for knowledge.

Apart from the conferences there is also the journal which is of high international repute and provides a good reference point for information. In the journal there is also information on several training programs for interested participants. Other contributions of the world body involve sponsored speakers to conferences, travel grants for young scientists and scholarships in some cases.

Currently in Africa the number of branches of WPSA are rather limited. However most of the active branches in line with the objectives of the association do embark on spread of knowledge , training and education at various levels.

02. INTERNATIONAL NETWORK FOR FAMILY POULTRY DEVELOPMENT

The establishment of the International Network for Family Poultry Development (INFPD) in 1997 as an off shoot of the original African Network for Rural Poultry development (ANRPD) addressed the problems of the African Poultry farmer who is based primarily in rural communities with small sized flocks comprising mainly of indigenous breeds of chicken. INFPD is now a working group under WPSA and is mainly an information exchange network whose main objective is to encourage high productivity within the family poultry sector. On the long run it contributes to alleviating poverty and maintaining food security.

03.ROLE OF APN IN EDUCATION

Information dissemination is one of the objectives of the APN. Being a virtual organisation, most of its actions are communicated via the networking facility. Thus making information available is of paramount importance.

1.**Formal Educational Programs**

- The branches within APN are encouraged to set up a data base on all institutions within their own country offering degree programs in Poultry Science courses. More often such courses are encompassed within a general Agricultural program . But to a great extent many areas in poultry science would be covered. Details on the institution addresses and mode of application and qualification for entry could be given.
- Institutions offering higher degrees with specialisation in poultry science both at the master's and Ph.D levels could be listed with all relevant details.
- Opportunities and Institutions offering diploma or short term programs on different aspects of poultry science could be listed.
- Certification programs on different aspects of poultry production could be listed

2. Conferences/ Workshops/Training programs

- All upcoming conferences, workshops and training programs at International, regional and branch level should be listed.

3. Informal training programs

- Branches can be encouraged to organise one-day seminars or workshops for farmers, poultry attendants etc. on relevant topics of interest.

4. Poultry statistics:

- It is important that there is a good data base on poultry statistics. This should include information on poultry population including all the different types and species of poultry from each of the African countries. There is also a need for the poultry products produced in these countries over the years. Additional information related to poultry such as number of poultry farms and other related information will also be useful and educative.

5. E-learning programs

- Short e-learning courses in Poultry can be developed and interested persons could be trained for a fee. There should be qualified staff who will handle this type of training. It would also be a source of income to the APN.

Example:

Model taken from ACS distance learning (UK)

Course structure

There are eight lessons as follows: (100 hours)

1. Introduction: terminology, pure breeds, cross breeds, brooders, commercial farming options.
2. Feed, Nutrition & Digestion.
3. Poultry Diseases

4. Laying Hens: extensive, semi intensive and intensive systems, housing, feeding the layer.
5. Broilers : the brooding period, feeding boilers, housing, hygiene and health
6. Incubation : natural, artificial, managing the incubator, reasons for poor hatchability.
7. Brooding: heating, feeders, drinkers, floor space, rearing.
8. Poultry Business: records, growth records, egg production records, costing a small scale operation, marketing

6. E – Conferences

- Special e- conferences could be organized for easy communication with members across the APN on relevant topics of interest from time to time.

7. Link to Poultry Library

- A special link in the network to education can include a list of basic poultry books which interested people could have access to. So also relevant publications of proceedings, journals etc. could be included in this site .A fee could be charged for non-member access.

04.OTHER RELATED ROLES OF APN

i. Industry updates

Industries interested in advertising their products can bring in information which can now be screened and included in the website for the information and education of the public. A fee could be charged for such advertisement.

ii. Research findings

Highlights of research findings and new innovations could also be publicized with possible leads to the researchers

05. RELATIONSHIP WITH INFPD

This is a very important sector in the African continent especially when it relates to the well being of the rural communities who contribute a large percentage of the poultry consumed in some of these countries. Education has a key role to play in this sector. Most farmers are inept in maximizing their production potential. Information dissemination and education is the key to solving this problem. How can the APN help? Rural communities lack networks and electronic media to benefit from the website and information therein. Therefore APN can access them only through intermediaries in this case extension agents or community workers. Special programs need to be mounted for them to educate them on how to approach such farmers and also for a feedback from farmers as to their needs. It is therefore imperative that there must be a synergistic relationship between APN and INPRD. Such a relationship will strengthen the ability for both parties to reach out to the rural communities in line with

the objectives of INPRD which is to increase productivity to alleviate poverty and ensuring food security.

06.CONCLUSION

From the above it is evident that APN has an important role to play in education training and capacity building. All of it cannot be achieved in a short time. But the framework can be laid down for branches to key into and work towards. The building of the network is the responsibility for all associated members so that the APN can be a reference point for poultry in Africa.

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Poultry Extension Services of African Poultry Network (APN)

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Summary

Many poultry stakeholders are facing difficulties because they do not have adequate access to micro-credit, niche agricultural markets or needed farm inputs in one hand. In the other hand, the low-input indigenous free ranging chicken production is very popular amongst resource limited rural communities, but it has not been given the due attention it requires in terms of development, marketing and policy support. The poultry extension services are hereby invited to play their own roles of sensitising, advocating and training of pilot farmers within the region and sub-region of Africa to implement some successful results which will help to improve poultry production within the network (APN). This paper is produced to see how APN can take the lead in helping the poultry stakeholders around Africa to improve the production and revenue of these categories of people to improve their living standard, while helping also the economy of their respective countries in the sub region.

Key words: poultry production, constraints, poultry Extension services, way forward.

Résumé

Résumé

De nombreux acteurs avicoles sont confrontés à des difficultés parce qu'ils n'ont pas d'une part un accès adéquat au micro-crédit, les niches de marchés avicoles ou des intrants avicoles nécessaires. En revanche, la production de poulet local à faibles intrants est très courante parmi les communautés rurales aux ressources limitées, mais cette catégorie de volaille n'a pas reçu toute l'attention due en termes de développement, de marketing et de soutien politique. Les services de vulgarisation du Réseau Avicole Africain (RAA) sont invités à jouer leur propre rôle de sensibilisation, plaidoyer et la formation des aviculteurs pilotes dans les régions et sous-région de l'Afrique à l'effet de mettre en œuvre des résultats de recherche qui contribueront à améliorer la production avicole. Cet article a été initié pour donner la possibilité au RAA de prendre l'initiative d'aider les acteurs avicole en Afrique pour améliorer leur production qui aura un effet sur les revenus de ces catégories de personnes; par ce moyen, ces acteurs pourront saisir cette opportunité pour améliorer leur niveau de vie tout en contribuant aussi à l'amélioration de l'économie de leurs pays respectifs dans la sous région.

Mots clés: Production avicole, Contraintes, Vulgarisation avicole, Perspectives.

Introduction

Many research studies are carried out on poultry sector either commercial or family-based to help the African population to overcome their day-to-day problems. The results from research in all domains in poultry are kept and sometimes are not published because of lack of financial means. In this case, the information cannot reach the users situated mostly in the

remote areas. The creation of a network can help in valorising these results by disseminating them where possible for their useful use by the poultry stakeholders. By so doing, many threats related to poor nutritional status and financial situation could be improved wherever this population can be found in the continent. Putting in place technologies developed by many Research or Universities institutions is one aspect and to disseminate them where it deserves is another factor. The African Poultry Network (APN) can help to do so through WPSA branches disseminated all over the continent. The steering committee and the INFPD's focal points can work hands in hands to overcome many difficulties faced by poultry stakeholders in various domains (feed, management techniques, veterinary aspect, genetic improvement and monitoring of poultry performances). It is obvious that such a forum bringing together all the members of the steering committee to discuss and put on a platform which can be usefully applied in their areas of competence can be useful to help population improving their live standard (financial and nutritional status with the empowerment of women and youths).

Challenges to overcome in the continent related to the development of Small Poultry Sector (SPS)

Some challenges have been pointed out and presented by many authors (Sonaiya, 2012; Swatson *et al*., 2001). The first challenge is that of chick production and supply to the stakeholders and high mortality. The level of chick production by unimproved birds is very low compared to that of commercial hybrids in high-input systems. There is also a lack of adequate pasture land, access to micro-credit, niche agricultural markets, veterinary and extension services, or modern farm inputs. Poor protection from adverse climatic conditions (very hot and cold weather) increased the severity of disease outbreaks resulting in losses of up to 70% of the flock at 12 weeks of age during winter. It was also observed that, disease prophylactic measures developed specifically for Small Poultry Sector (SPS) are scarce and high chick mortality rates are frequently reported in Africa (Wilson, 1987; Bessin *et al*., 1998; Dakpogan *et al.*, 2011). For example, it has been found that the mortality estimations of indigenous chickens under extensive family-based management systems were 50% up to eight weeks of age in Burkina Faso (Wilson, 1986) and Northern Ghana (Veluw, 1987) and 66% by 12 weeks of age in Senegal (Guèye, 1998).
The feed resources availability and use are very important. The lack of knowledge among poultry owners, marketers, extension personnel, researchers, government policy makers and project development officers on one hand, and a non-supportive educational system, on the other hand should be mentioned (Sonaiya, 2009).
To overcome some of these challenges, Swatson *et al.* (2012) designed survey methods to extract information on area of human demography, production systems and poultry production, ethnoveterinary practices, potential markets, production constraints, social networks and extension services. Obtained results led to interventions that were implemented successfully by farmers.

Poultry Extension

Free-range chicken production is carried out with minimal agricultural, veterinary or marketing extension support. Households make use of their indigenous poultry rearing

knowledge acquired over a long period of time. Results from survey studies indicated by Swatson et al.(2012) that about 53.7% of poultry farmers required training in poultry husbandry and that farmers shared relevant information with neighbours, usually when there is a disease outbreak or there is a need to market birds. This happens mainly because of the non availability of the farmer or poultry organizations from which households can obtain the necessary information and knowledge related to poultry husbandry. In many cases, there are no recognised agricultural organisations which can address issues related to the animal farming that can help the poultry stakeholders Indigenous free-ranging chicken development has not been given due attention it requires in terms of research, development, marketing and policy support by NGO's and governmental institutions. Most urban dwelling households have limited or no exposure to its indigenous poultry meat as a food, but many are willing to try it. Implementing detailed educational and marketing strategies would help to develop the niche organic poultry market, in addition to other developments such as the formation of cooperatives or the strengthening of the Network for Free-ranging Poultry Development.

Genesis

The inaugural meeting of the African Poultry Network (APN) took place during the 13th European Poultry Congress held from 24th to 27th August 2010 in TOURS (France) at a workshop following the European Poultry Conference in September 2010. At that time, five Network "champions" were elected and an APN Steering Committee was subsequently formed which included the champions as well as three additional representatives from WPSA branches in sub-Saharan Africa, to provide geographical balance. The Steering Committee had representatives from Cameroon (Dr Fotsa Jean Claude), Togo (Prof Tona Kokou), Ghana (Comfort Kyerewa Acheampong), Kenya (Thomas Junne Kaudia), Mozambique (Rosa Felizarda da Costa) and South Africa (Swatson Harry). This team, associated to other members like Prof Uswege M. Minga (Tanzania), Prof Daisy Eruvbetine (Nigeria) will be very important to find in the whole sub Saharan Africa appropriate solutions for poultry production. This team will work and come up with what is necessary for the benefit of the entire continent and beyond.

Description of the Network

WPSA – AFRICA POULTRY NETWORK dubbed APNETis a Targeted Thematic Network covering research, education, extension and organisation activities in the various fields of intervention (genetics and breeding, feeding and nutrition, housing husbandry, health care, processing, product quality, transportation, marketing, packaging, consumption, financing, food safety and socioeconomics) for the whole poultry value chain.
To carry out its activities, WPSA APNET will aim:

- to bring together all organisations active in the African poultry sector, industry, academia, research institutes, development bodies, NGOs, national centres and poultry associations.
- WPSA-APNET will be an instrumental tool to meet the sector needs, by providing the necessary forum to share successes, opportunities, problems and experiences and to facilitate the transfer and mainstreaming of relevant technology and innovations into the interested African poultry sector, both family and commercial operations, by

taking into account socio-cultural and economic conditions. This could be done by involving various actors (producers' and marketers' associations, market companies and organisations, inputs' suppliers, etc.).

- WPSA-APNET will cover all activities related to poultry production, processing, marketing and consumption.

Threats concerning the poultry sector in Africa

1. Low productivity and efficiency common along the poultry value chain as illustrated by:
    - Reliance on unselected (or randomly selected) genetic material with low production for family poultry sub-sector and the poor management practices in the small-scale commercial poultry subsector. Nevertheless, this poultry su-sector is relatively efficient considering the extremely low levels of inputs
    - Poor feed quality and over reliance on imported ingredients,
    - Poor management practices with the absence of application of basic biosecurity measures even in the face of Avian influenza risks,
    - Uncoordinated research efforts,
    - Lack of well planned extension services,
    - Unresponsiveness to changes in the world poultry production scenarios,

The Network aims to tackle and solve all these problems through key well-designed action plans and implemented relevant actions.

Purpose of the APNET

Major activities to be undertaken by the APNET

After the APNET's structure is put in place, the planned activities could be listed as follow:

1. Registration of various networks and their activities carried out on the field, their strengths and weaknesses, the funding scheme and management, the outcome of their activities as regard to the wellbeing of the populations concerned,
2. Developing a fundable proposal for the implementation of the poultry extension services,
3. Organizing regional workshops with eminent lecturers and researchers on specific domains that should lead to adequate interventions to be implemented for the improvement of the whole poultry sector (commercial and family poultry production)
4. Organizing two e-conferences between APN steering committee members to stimulate membership
5. Organizing a workshop to create a road map for the African poultry sector specific to each country
6. Advocating and sensitizing towards governments and donors, in order to propose coordinated projects with a high chance of success, propose qualified supervisors for these projects
7. Monitoring of APNET's activities in each country and in the sub-regions
8. Funding specific activities to log the poultry sector into the road map

What is done so far

- Meetings held in Bafoussam (Cameroon) on August 15th 2011 with poultry stakeholders were organized to discuss issues related to poultry production as regards to health and management practices in the production zones of Cameroon.
- Contacts have been taken with potential members of WPSA from Gabon, DRC, Chad, Central Africa Republic

What is to be done

- Make an inventory of types of breeds bred in the sub regions for the promotion of family poultry production
- Make an inventory of poultry projects and domains of activities in the concerned countries and which can be extended to the sub regions
- Gather/Collect results of such projects and way forward for improvements to be provided if any

Way forward for extension services

The family-based poultry sub-sector in central Africa is not a new sector as such but needs some innovations. Many NGOs have been doing tremendous works related to help of some farmers to rear chickens (broilers and layers) on the field along with technical ministerial departments (Ministry of Agriculture, Ministry of livestock and fisheries, Ministry of Scientific Research and Innovation). To avoid lots of difficulties, first steps to be carried out should be: (1) to penetrate into the sector by sanitary innovations (with research results which have been found to be successful in terms of mortality decrease, increase of number and improvement of health conditions of the animals); (2) choose pilot farmer groups to apply model prophylactic programs (mass vaccination of indigenous chickens and other animal species). The aim of these methods is to extend this activity into other areas taking into account difficulties faced on the field and putting in place extension strategy of sensitizing and implementation of some successful results on the followings:

1. Conduct mass immunization of poultry (vaccinations mainly against Newcatle Disease and fowl pox) in the pilot villages and farmers;
2. Organize training sessions of pilot farmers on the mastering of concepts and also the management techniques of rearing chickens of either local or commercial breed; this can include feed compounding using available feed stuffs easily found in the areas and at the affordable price;
3. Create demonstration units of commercial and family poultry farms for targeted training aspects to be identified and implemented;
4. Create forum of discussions among researchers, university lecturers, veterinary experts and targeted poultry farmers;
5. Put in place a platform on the domain of intervention in the various subjects (feeding, health care, management of chicks and adult chickens). This can also include the inventory of micro projects and technical pamphlets used so far in various poultry activities.

Conclusions

Many poultry stakeholders are facing difficulties because they do not have adequate access to micro-credit, niche agricultural markets or needed farm inputs. Thus the low-input indigenous free ranging chicken production is very popular amongst resource limited rural communities, but it has not been given the due attention it requires in terms of development, marketing and policy support. The reasons for the lack of commercialization of free-ranging chicken

production are manifold and include a complex interaction of biological, socio-economic, cultural and agro-technical factors. Household training in poultry management, simple veterinary methods (i.e. vaccination, deworming, and disease detection), feeding practices, and the use of improved indigenous breeds are necessary in order to ensure sustainability of free-ranging indigenous poultry development projects. Training methodologies must take account of the high levels of illiteracy amongst resource limited households especially women. With growing public concern over the use of antibiotics, herbal extracts appear be gaining popularity amongst farmers. The poultry extension services are hereby invited to play their own roles of sensitising, training of pilot farmers within the region and sub-region of Africa to implement some successful results which will help to improve poultry production within the network (APN).

Acknowledgment

Sincere thanks are addressed to CTA and WPSA which have let the presentation of this paper possible during the the International congress on advancements inn poultry productions in the Middle East and African states held from 21-25 October 2013 in Antalya, Turkey and also to share this topic within APN members.

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APPENDIX C

NOTES TAKEN AT WORKSHOP ON THE DEVELOPMENT OF THE AFRICAN POULTRY NETWORK
as part of *The International Congress on Advancements in Poultry Production in the Middle East and AfricanStates*

Antalya, Turkey, 25 October 2013

Rosa Costa and Comfort Acheampong

VENUE: Spice Hotel and Spa, IskeleMevkii, Belek 07506 Antalya, Turkey

ATTENDANCE: See attached list

1. **Session 1: Opening of the workshop –** *Chaired by Prof. Sonaiya*

Prof. F. Sonaiya welcomed the participants and recognized the opportunity that had been provided for the discussion of the development of the African Poultry Network (APN). He gave a short introduction about the possibility of forming an African Poultry Network in Istanbul in 2004, and still in Turkey in 2013, discussions are still going on. He was particularly grateful to Dr. Pym, "the father of APN" for his special interest in the development of APN and all the efforts he had made to ensure the participation of all WPSA branches in Africa. In a summary, he reminded members that APN should be used to solve field problems.
In his opening address,Dr. Edir Silva, World Poultry Science Association (WPSA) President, also expressed his thanks to all the participants and members of the Steering Committee and especially to Dr. Bob Pym. He recognized support from theTechnical Centre for Agriculture and Rural Cooperation (CTA) and mentioned that this was a unique opportunity to have us all together and that it was important to use our time objectively based on formal but open discussions. He recommended that APN congresses based on solving field problems be organized along with poultry exhibitions partnership in order to raise funds every two years. If possible these should coincide with the World Poultry Congress in 2016. He ended his speech by saying that facing the challenges together will be his effort to see to the success of APN.
Dr. Bob Pym, chair of the WPSA - Africa Actions Subcommittee, expressed his gratefulness towards the implementation of APN. He traced the historical outline of the progress of APN. He reported that at the meeting in Tours, France as a parallel program at the last European Poultry conference in August 2010, several African delegates from different countries were present. At this forum five champions were selected to take charge of the preliminary activities of the network. A steering committee was also set up. During the first (African International Poultry Summit (AIPS) held in Nigeria in2011 a parallel session of the APN was also held. He said that APN is strongly supported by WPSA and indicated that CTA is expecting a report with recommendations from the workshop.
After the opening and the welcome address, the following presentations were made by some invited members on specific topics based on a proper start of the APN. These included:

1. **APN: VISION,MISSION, OBJECTIVES AND CHALLENGES** *presented by Rosa Costa:*

The first presentation on the Vision,Mission, Objectives, Core Values and Challenges of the APN was done by Rosa Costa from Mozambique.
The major issues raised during the discussion were:

- APN should choose one working language.
- How do we identify the poultry needs in Africa?
- APN should consider the partnerships between North –South on a voluntary basis as this is already happening in most places.
- The word "industry" in the vision and mission is not embracing; APN should promote all sectors, not just industry.
- It is important to consider sustainability of APN.
- In the mission – replace Africa by Sub-Saharan Africa.

Session II: Chaired by Daisy Eruvbetine

2. **APN CONSTITUTION: STRUCTURE AND CONTENT** *presented by Thomas Kaudia:*

Discussion:
Dr. Harry Swatson added that WPSA branch where the president residesshould provide support with the internal audits. He mentioned that he was happy to see that the constitution is gender sensitive.

Michele – suggested that for the group work on potential role of APN impacting research, extension and education, one additional group to incorporate practical issues in the constitution should be identified so that at the end of the day we have the final draft and it was proposed that Michele, Rosa, Daisy, Thomas and Prof Sonaiya should be part of this last group.
FOTSA - suggested that APN constitution should be submitted to legal agents in each country to avoid any conflict of interest as in each country people are already in the field and it's important to liaise with them.

3. **INFORMATION, COMMUNICATION AND TECHNOLOGY STRATEGY FOR APN** *presented by Harry Swatson*

- APN strategy should be in place to make sure we are achieving whatever we say we are going to achieve.
- Webpage name: African Poultry Network of the WPSA (www.apn.....Dr. Harry is going to provide the full name).
- Contributions for the webpage have been received but they were mainly related to small scale poultry production.
- By Monday the inputs and changes will be included into the website.

Discussion:
Thomas- suggested that the webpage should showAPN destination, where we want to go and that we have to include a space for National events.

Denis – suggested including automatic translation because it will ensure access for more people. Even if the translation is not perfect, it's always better to have. Structure, constitution etc. it is not what people are looking for when they log in. They are looking for relevant information for them. It is also important to access how people are accessing the website.

Michele - The structure of the webpage needs to be organized in order to include a private space for the network members, there should be a pass word known only to members as a form of security, but the majority of the information should be available for everyone.
Harry - Within the next 2 weeks each person present at the APN workshop should prepare a contribution to the webpage and send to Harry.

Prof. Sonaya– the web page should include a link to CIRAD/ Denis website

Session 3: Challenges and opportunities -*Chaired by Comfort Acheampong*

4. **OVERVIEW OF POULTRY PRODUCTION IN SUB-SAHARAN AFRICA (Commercial)–** *presented by Kevin Lovel*

   The Issues he discussed were based on the following areas:
   - GMOs grain.
   - Feed ingredient access.
   - Trade policy – it´s fine to have subsidies but they can be distorted when it comes to exports. It is important to have political support.
   - Disease status/ vet services.
   - Infrastructure/ logistics.
     - Cold chain- most people will continue to eat frozen chicken,
     - Electricity availability,
   - Real wage growth vs. economic growth.

For the next 5 – 10 years Asian growth is likely to exceed African growth. It is expected that African demand will be much higher than production

Discussion:

This was based on the main constraints for self sufficiency in feed production
Prof. Edir Silva touched on Grain production in Africa, and mentioned that investors in poultry production should also invest in feed mills. It is expected that Zambia will grow in the next few years due to the grain production whilst West Africa have limited areas where you can focus on commercial maize and soya cultivation.

The main constraint for self sufficiency in feedproduction can be linked to:

- Cost of the ingredients because of the logistics involved. Cost of the maize for commercial purposes becomes very expensive also because it is a staple food in many countries. Therefore political support is very important.
- Maize is a contributing factor for the high cost of poultry production among others in Africa.

5. **OVERVIEW OF FAMILY POULTRY PRODUCTION IN SUB-SAHARAN AFRICA-***presented by Prof. Uswege Minga*

- Family poultry in SSA will continue to be important for quite some time, so long as there is rural life and there is poverty. They are hardy and difficult to be wiped out.
- Hence experts should continue to take FP seriously (not to be abandoned): makes economic, socio-cultural and nutritional sense.
- Priority: control losses and then improve productivity and then marketing
- Changes (poultry population) will most likely and slowly be from free range (to backyard ?) to smallholder commercial and to large scale commercial

Discussion

During the discussion, Harry disclosed that issues of better husbandry practices in family poultry keeping must be followed. To this end Bob said that the APN has a big responsibility of trying to bring small scale poultry into commercial production since families are mainly poultry keepers and not poultry producers.

Michele revealed that at the last conference of the Veterinarians, there was a session on family poultry which was not common during such veterinary conferences. She and Robyn presented a paper on one health. This was a step in the right direction as it helped to increase awareness among policy makers and all.

Denis:added that there are different contributions in this sector: social, economic, cultural and the like, but evolution from small scale traditional poultry keeping to small scale commercial is not likely to happen now. A clarification from Prof.Minga showed that there can be small scale transformation and not evolution.

6. **CURRENT SITUATION AND THEIR POTENTIAL ROLE IN THE START OF APN**

A**. Poultry research activities and capability in Sub-Saharan Africa -***Presented by Tona Koku*

- Review 2010- 2013- very few publications in high impact journals. In total 75 publications were used.
- Research activities are mainly focused on broilers and layers: and the subjects are more on the effect of Environment on genotype and management, molting, delay in feed access, Feeding and nutrition, physiology, metabolism, poultry health, less nutrition and behavior.
- Challenges: Reproduction and incubation, Socio-economy, Cross exotic cock with indigenous hen, Innovative feeding, thermotolerance and thermoregulation ability, processing and food safety.

Discussion

Edir Silva –From the above presentation, the question was that should research be done on chicken adaption in Sub -Saharan environment or should we adapt housing and management to the existing poultry? In this regard research topics need to be prioritized and collaborative research could be a way for APN.

For his contribution, Bob added that as a follow up to this presentation it would be valuable to provide the existing capabilities for education and training in SSA but who is doing what and who are the players.
After series of discussions and contributions, it became clear that this presentation is an area where APN can make impact. Such findings can be on the website. Also an inventory of human resources in terms of development and opportunities for young scientist in African Universities be included. In such research, priority areas such as breeding, selection and feed must be looked at to find out if there are already existing solutions. Then it must be mentioned.

B. Role Of APN in Education, Training and Capacity Building–*Presented by Prof. Daisy Eruvbetine*

In her presentation it came out that there are only 13 branches of the WPSA in Africa. She mentioned that the actual objectives of the WPSA are: Education, organization and research. The dissemination of knowledge to all members can be done through:

- Organising short courses where certificates are warded.
- Conferences.
- Branches organizing informal programs and seminars.
- Developing a data base for poultry statistics.
- E. Learning programs.
- E. Conferences.
- Library Access.
- Research Findings and publications.
- Others – Industrial related updates.

Discussion:

After the presentation, Michele sounded a caution about advertisement and E- Conference. Her main concern was that If APN doesnot provide relevant information to a range of stakeholders it can be an issue. As long as APN start to ask for a fee, it means we are doing business and it is important to have analytical certified information that should reach the target group.
On this note Prof Sonaiya asked members to consider collaboration with INFPD. Contributing on the use of E-Conference he revealed that INFPD has had 5 or 6 E-conferences and they all worked very well. They are easier to handle even in Africa, but needs a good server.If WPSA has a server that APN can use, then it could also be a good strategy.

C. Poultry extension services – *Presented by J. C. FOTSA*

The need for the use of extension services in poultry production cannot be over emphasized. The presenter mentioned the important areas for proper extension work these included:

- Definition, and identifying the use of the existing systems.
- Making an inventory of types of breeds etc.
- Choosing pilot farmers.

- Organizing training sessions.
- Creating forum for exchange of ideas.
- Choosing the right information channel.

7. GROUP DISCUSSIONS ON THE CURRENT SITUATION AND POTENTIAL ROLE OF APN IMPACTING RESEARCH, EDUCATION AND EXTENSION:

Members were put into 3 groups for discussion and reporting.

GROUP ONE - Draft Constitution – members were Dr. Michele Tixier-Boichard, Thomas J. Kaudia, Dr. Robert Pym, Dr. Rosa Costa.

GROUP TWO – Research, Education, Training and building capacity. Members were: Prof. Minga, Dr. Denis, Prof Sonaiya, Dr.Kevin, Dr. Tona, Prof. Daisy, Dr. Harry and George.

GROUP THREE – Poultry Extension Services. Members: Dr.FOTSA, Prof. Edir and Dr. Comfort Acheampong.

Group Presentations and discussion:

1. Draft Constitution

Discussion:
The present version of the draft constitution will be approved today, sent to everybody who has been working in the establishment of APN for further comments and Thomas has to send the constitution which needs to be registered to WPSA . It was suggested that professor Decuypere should be a member of the advisory committee.
Article 12: include - An APN symposium (either physical or virtual) will be held periodically taking advantage of other relevant WPSA meetings.
Edir: What are the main obligations of the constitution? The committee should take these comments on board.

Next steps:

1. Draft of the constitution and the by-laws to be finalized and circulated by the WPSA branches by the end of December and before the board meeting.

2. Group 4: Poultry extension services

Report of the Extension services were done under the under listed areas

- Definition.
- Identification and use the existing systems.
- Approach private sector.
- Offer cooperation through WPSA branches.

Make sure the information is there for proper dissemination

Next steps:

Edir to send definitions to Harry.

3. Group 2: Research and Education, Training and building capacity

Composition: Sonaya, Daisy, Tona, Minga, Bastienelli,

- Role of APN in poultry research.
- Role of APN in education, training and building capacity.

Discussion:

In our attempt to encourage young members (Youth) to present research findings Edir Silva shared the Brazilian experience on promoting poultry science and technology exchange by the youth: Best poster presented at the annual conference on poultry science and technology received a premium equivalent to $1000, Brazilian Journal of poultry science was created as well as books. The books are published at very low cost and sold as a way to get funds. People who prepare the books are not paid.The board of the WPSA Brazilian branch meets every month with about 30 People in attendance.
Private sector also organizes exhibitions.
The Dutch Branch of the WPSA has also a Foundation for Promoting Poultry Science. Individuals and organizations may apply for financial support for appropriate WPSA activities such as conferences, congresses and symposia. Applications for financial support of conferences, congresses and symposia are forwarded through the local WPSA Branch. The Foundation operates differently from the WPSA branch. They provide sponsorship for youth programs during WPSA congresses.

FINAL DISCUSSIONS – *Chaired by Bob Pym*

Michelle Boichard presented the role of APN in poultry development in Africa: She described this move as a great expectations and great potential for APN to be on the way towards an African federation?
The main innovation for APN would be to organize working groups including family poultry. In this way FP would benefit from the ongoing research.
CHALLENGES TO BE MET BY APN
The following are some challenges that have been identified:

- Challenges for training at all levels including Technicians, State services,
- Awareness of policy makers,
- Exploit E- learning,
- Mapping initiatives, training centers, NGO Projects.

HOW TO MEET THE CHALLENGES
These can be tackled through:

- Organization using a clear and easy to explain the common vision,
- Stimulate and rely on branches,
- Use proper tools to communicate, share and provide information,
- Reactivate members through sharing knowledge,
- Encourage working group formation like the INFDP,
- Support initiatives for research and training like the establishment of demonstration farms,
- Organize an APN biennial conference,

Next steps:
APN shall think about what sort of working groups it is needed to develop.

CONCLUSIONS AND RECOMMENDATIONS

Activity	Responsible	Time frame	Obs.
1. Funding model for foundation	Daisy, Michele, Thomas	February 2014	
2. Finalize constitution and Bylaws	Thomas	December 31	
3. Check list must be prepared and circulated. (what we need to tell our branches)	Kevin, Harry, Rosa	within the next 2 weeks (10 November)	
4. Communication with WPSA branches	Michele, Minga	End of November (30 November)	
5. E- conference: Identify the Theme.	FOTSA, Denis. (FOTSA should pick some people to assist him)	End of December (21 December)	Make sure that the theme will be attractive
6. Target Groups. Circulate to members			
7. Strategic partnerships: As soon as APN is launched contact relevant agencies (IBAR, CORAF etc) to inform them about the existence of APN and its role			
8. Circulate the notes of the meeting	Rosa, Comfort	One week (by 31 October)	
9. Website	Harry	End of October (31 October)	Contributions to be sent to Harry before he updates the page. Website will be supported by WPSA at the initial stage.
10 . APN shall think about what sort of working groups it is needed to develop			
11. Edir to send definitions to Harry	Edir Silva		
12. Prioritize the research topics	Tona Koku		
13. Identify the poultry needs in Africa			

Nominated participants, members of the APN Steering Committee, supported by CTA

1.	**Title and Full Name:**	Mr Thomas Kaudia
	Organisation:	Special Foods International, Kenya
	Position within Organisation:	Director
	Role WPSA/ APN	Chair APN, Nominated President of newly formed Kenyan branch WPSA
2.	**Title and Full Name:**	Professor Daisy Eruvbetine
	Organisation:	Federal University of Agriculture, Abeokuta, Nigeria
	Position within Organisation:	Professor of poultry nutrition
	Role WPSA/ APN	Past President Nigerian branch WPSA
3	**Title and Full Name:**	Dr Harry Swatson
	Organisation:	Cedara College of Agriculture, South Africa
	Position within Organisation:	Manager Further Education and Training
	Role WPSA/ APN	APN website manager
4.	**Title and Full Name:**	Dr Rosa Felizarda da Costa
	Organisation:	Kyeema Foundation/ International Rural Poultry Centre, Mozambique
	Position within Organisation:	Regional Project Manager
	Role WPSA/ APN	Member APN SC, No WPSA branch yet in Mozambique.
5.	**Title and Full Name:**	Professor Kokou Tona
	Organisation:	University of Lome, Togo
	Position within Organisation:	Professor and researcher
	Role WPSA/ APN	Secretary Togo branch WPSA
6	**Title and Full Name:**	Jean Claude Fotsa
	Organisation:	Institute of Agricultural Research for Development (RAD), Cameroon
	Position within Organisation:	Professor
	Role WPSA/ APN	Secretary Cameroon branch WPSA
7.	**Title and Full Name:**	Uswege Minga
	Organisation:	Open University of Tanzania
	Position within Organisation:	Registrar and Professor
	Role WPSA/ APN	President Tanzania branch WPSA
8.	**Title and Full Name:**	Comfort Kyerewa Acheampong
	Organisation:	Ghana Education Service
	Position within Organisation:	National Coordinator Agriculture and Environmental Education
	Role WPSA/ APN	Secretary Ghana branch WPSA