International Network for Family Poultry Development
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E-conference of the International Network for Family Poultry Development in collaboration with FAO and supported by the International Fund for Agricultural Development (IFAD)

Strategic interventions for Family Poultry –
What can be achieved through Research & Development activities

Summary and Conclusions

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28 May – 15 June 2012

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List of Acronyms

BPL	Below poverty line
CPS	Commercial Poultry System
DOC	Day Old Chick
FPS	Family Poultry Systems
HPAI	Highly pathogenic avian influenza
ND	Newcastle disease
R&D	Research & Development
SFRB	Scavengeable Feed Resource Base

1. Executive Summary

Discussions, which were conducted in three languages (English, French and Spanish) on the theme "Strategic interventions for Family Poultry – What can be achieved through Research & Development activities", focused on the following eight major issues under the subtopics:

1. The contribution of research to the development of family poultry production systems.
2. The development for livelihoods through family poultry — cost and opportunities.
3. Competing or complementing commercial poultry production systems?
4. Single *versus* multiple (integrated) interventions for sustainable development of family poultry.
5. Good organizational models for sustainable family poultry development.
6. Women empowerment through sustainable family poultry development.
7. Influencing policy for family poultry.
8. The future contribution of INFPD and other networks to family poultry development.

In discussing the first subtopic of the conference (What is the contribution of research to the development of family poultry production systems?), there was agreement among the participants that family poultry research, though not taking place in all the countries that need it most, contributes to the development of family poultry systems (FPS) as shown most clearly in India, Bangladesh, Pakistan and other countries in Asia, and in Burkina Faso, Senegal, Mozambique, Tanzania, Togo and other countries in Africa. The greatest results were obtained in the development of new genetic breeds, strains and hybrids particularly in Asia, where breeds were reported coming from India, Sri Lanka, Indonesia etc. Different supplementary feeding resources and thermostable vaccines (V4, I2, D58) were investigated and sustainable vaccination protocols were developed. It should be mentioned that a significant number of research and development (R&D) activities were supported by donor funds from outside the recipient countries. This is an important point that retards research from being done in sufficient quantity and quality and makes application of the results (i.e. development) more difficult. There is need to promote FPS R&D with in-country funds and to link such activities with the national extension system.

Discussants of the second subtopic (The cost and opportunities of family poultry development for livelihoods) agreed that livelihoods, especially of women and children, benefit from keeping family poultry. The issue of sustainability was raised and the threat to FPS posed by rising urbanization and changing lifestyles was also countenanced. The opportunities for FPS from organic farming tendencies were highlighted and the warning sounded of the danger of extinction of native breeds due to FPS development schemes. FPS will contribute more to livelihoods if cooperative activity and micro-financing help to diversify farming business.

In addressing the third subtopic (Is family poultry competing with or complementing commercial poultry?) participants indicated that the two systems may pose dangers to one another. For example, during the highly pathogenic avian influenza (HPAI) epidemic, a lot of FP birds were destroyed as they were seen as a source of the virus. On the other hand, the high consumer preference for FP in most countries trims the market for commercial poultry among certain consumers. On the positive side, the advances made in commercial poultry systems (CPS) benefit family poultry systems (FPS) while the "green or organic" name of FPS gives CPS more acceptability than other livestock products. This tension between the two systems may not go away and may be beneficial to both systems.

Subtopic 4 (Single *vs.* multiple intervention) was decided in favour of integrated interventions. Where resources were limiting, it was recommended that single

interventions be sequential in an additive way. It was agreed that the priority should be on health (with housing) and nutrition before genetic intervention. A value chain approach was recommended with emphasis on market development, input supplies and training as well as access to credit and markets.

On subtopic 5 (Good organizational models for sustainable family poultry development), different models were identified. The African model is based on vaccination as the lead intervention but in a holistic programme. The Asian model adopts a more market-based approach with the private sector (commercial and NGO) playing a prominent role in model implementation. A Latin American model was mentioned but details were not provided. Three other models were listed arising from private companies, international development assistance and even individuals and institutions. Successful and sustainable models shared a common interest in value chain approach and group involvement.

Discussants did not hesitate to state that subtopic 6 (Women empowerment through sustainable family poultry development) was a real issue and gave examples of how women were empowered through FP. The most significant empowerment occurred when women acted as vaccinators and poultry advisers which assured them an income and enhanced prestige within the village and greater opportunities to have a say in family decision making.

The role of policy in FP development (subtopic 7: Influencing policy for family poultry) is becoming clearer. Examples from FP programmes in countries like India, Ethiopia, Uganda and Swaziland confirm the influence of generating the right policies. Discussants mentioned international organizations and programmes (e.g. FAO, IFAD, ILRI, World Bank, INFPD, DAD-IS) to have influenced policy on FP in various countries. Some countries (e.g. Indonesia) have developed a policy against FP (in the wake of the HPAI epidemic) which is neither to be encouraged nor emulated.

The final subtopic (The future contribution of INFPD and other networks to family poultry development) stumped most participants. However, the clear influence of INFPD and other networks on the development of policies and programmes in developing countries shows the way ahead. There is need for INFPD and other networks to collaborate more closely with country level policy makers for the benefit of FP development.

2. Introduction

The UN General Assembly has declared 2014 to be the International Year of Family Farming. To mark this important initiative, FAO plans to publish in 2014 a major study on family farming and agricultural innovation systems (AIS) in its State of Food and Agriculture (SOFA) series, which is FAO's major annual flagship publication. Our network, INFPD, can claim that we have been paying attention to family poultry farming for the past twenty years. As part of INFPD's IFAD-funded and FAO-implemented project, a series of three electronic conferences was held between January 2011 and June 2012. This third and last e-conference, held from 28 May to 15 June , had the theme "Strategic interventions for Family Poultry – What can be achieved through Research & Development activities".

During the 3 weeks of the e-conference, the least number of interventions came in the first week with a total of 11 interventions from 8 different countries (Belgium, Canada, India, Tanzania, France, Senegal, Nigeria and Indonesia) 2 in Europe, 2 in Asia, 1 from North America and 3 from Africa. There were 3 interventions from India and 2 from Canada during this first week. The second week saw the greatest number of interventions; a total of 24 interventions from 15 countries (Belgium, Ecuador, Australia, Angola, Bolivia, Bangladesh, Togo, India, UK, Sri Lanka, South Africa, Burkina Faso, Mali, Pakistan, Indonesia) 2 from Europe, 2 from South America, 1 from Oceania, 5 from Africa and 5 from Asia. There were 6 interventions from India, 2 each from UK, Bangladesh, Australia, Angola and Togo. In the third and final week, there was a total of 22 interventions from 12 countries (South Africa, Bangladesh, Niger, India, UK, Pakistan, Burkina Faso, Mali, France, Swaziland, Botswana, Turkey) 6 from Africa, 3 from Asia, 3 from Europe, 5 from India and 3 from Bangladesh and 2 each from South Africa, Burkina Faso and Swaziland.

In all, there were 61 interventions, not including those from the 3 moderators, from 24 countries (Angola, Australia, Bangladesh, Belgium, Bolivia, Botswana, Burkina Faso, Canada, Ecuador, France, India, Indonesia, Mali, Niger, Nigeria, Pakistan, Senegal, South Africa, Sri Lanka, Swaziland, Tanzania, Togo, Turkey, UK)- 11 from Africa, 5 from Asia, 4 from Europe, 1 from North America, 2 from South America, and 1 from Oceania. The greatest number of individual interventions (9) came from Sujit Nayak from India. Clearly, the conference was well attended and tackled the topic adequately.

3. Summary of the conference topics

The conference assumed that the participants had a common understanding of family poultry but it was soon clear that there is a need to define or redefine the term. **Teno** (5[1]) drew attention to the problem that the term raises confusion as to whether it refers to "small scale with exotic species" or "traditional with local species" and he proposed that the term be re-examined and clearly defined. **Rangnekar** (5) posited that "FP is 'producer centered' in the sense that the *'producer does not have to approach retailer or consumer for sale but they approach the producer'*. While the producers may get lower prices for the products they consider the savings in drudgery/hassle/time/energy spent on selling the product, which savings are used for other livelihood activities". The point he is making is that resource-poor people depend on many risk-aversion methods including FP and that many activities in FP development may be shifting FP away from low external inputs and so increasing risk to the resource poor. The issue of definition of which poultry production systems qualify to be included in family poultry is still very much unsettled. Thieme et al. (2012, pers comm.) recommend that FP should be understood to include 4 production systems – small scale extensive scavenging, extensive scavenging, semi-intensive and small scale intensive - with a pointer to the last three as of interest because they are open to interventions (scientific, technological and economic) since they have the objective of higher productivity and income. This should be borne in mind as the discussion during the conference is reviewed.

3.1 The contribution of research to the development of family poultry production systems.

The following questions were raised to guide thought on the subtopic:

- Different research methods (field studies, surveys, case studies, experiments, etc.) have been employed to develop family poultry in the last three to four decades. How did the results of these methods contribute to the development of the family poultry subsector in developing countries? Which of these methods has given the most significant results?
- Are the methodologies and publications of family poultry research of sufficiently high quality?
- Genetic resources, feed, animal health and economics - To which of these fields did research make the greatest contribution?
- Should research for family poultry be conducted at a global, national or regional level?
- Are findings from family poultry research well documented and easily available?
- Do the family poultry producers of specific regions of the developing world benefit from research more than others?
- How can technology be applied in family poultry production?
- Can the technology and expertise developed in the commercial poultry industry be useful for the development of family poultry production?
- Is private research contributing to family poultry development?
- Are family poultry producers keen on applying new research findings?
- How can farmers' innovations help family poultry management?
- What simple technologies which are readily available could yield improvements in family poultry production?
- What are the most effective ways of transferring research findings to family poultry producers?

[1] The numbers given with the references refer to the list of messages prepared from the contributions to the e-conference.

On this subtopic of FP research and its effect, there was a surprising harvest of information. From Africa, **Mwambene** (2) identified research areas in FP in Tanzania as mainly focused on locally available feed resources, animal health and production as well as on their socio-economic contribution at household levels but not on genetics. This is a surprising claim as important work on the genetics of local chickens in Tanzania has been done at the Sokoine Agricultural University in Morogoro, Tanzania. **Traore** (6) from Senegal observed that from the creation in 1962 of the Centre Nationale Aviculture/ Mbao, it focused exclusively on CPS until FAO and INFPD began to draw attention to FPS in the 1990s. Since then, diagnostic or baseline surveys have identified health (Newcastle Disease - ND) as the first constraint, then feeding, lack of or inappropriate housing and lack of organization of value chain actors. Research results have given ND treatment calendar, thermostable vaccine (I-2) and proper usage of liquid vaccines. Along with health, research has also resulted in improvement in genetics, feeding, housing and marketing. **Ekoue** (20) in Togo, drawing on experience from 3 projects - Projet de Développement du Petit Elevage dans la Kara (PRODEBEKA), Projet Sécurité Alimentaire/ Diversification (PSA/D), and Projet d'Appui pour l'Elevage Familial (PAEF) implemented by Agronomes et Vétérinaires sans Frontière (AVSF) - identified research as touching on feed and health which have been used in regional and national poultry development plans. Later, research began to focus on characterization of local poultry genetic resources. He observed that many countries have evaluated the phenotypic characters but these have been complicated by the many waves of cockerel exchanges carried out in these countries. It has been noted that cockerel exchange started in West Africa in the early 19th century and has continued unabated till the present. **Pousga** (21) from Burkina Faso agrees that research topics in the poultry sector in general and the family poultry sector in par ticular were mainly based on the nutritional aspects and little attention was given to other research topics such as genetic selection and health status. She recommends further research focusing on poultry production systems suitable for resource-poor people in Burkina Faso. **Swatson** (22) from South Africa reports that the application of research and development activities has had an impact on family poultry production in South Africa mainly through lowered effects of diseases due to improved poultry husbandry practices, supplementary feeding and adherence to a basic poultry health program. Overall, he reports, this has resulted in a 79% increased survivability and a 23% improvement in live weight at 20 weeks of age, an age at first egg of 126 days, a total number of 4 to 5 clutches of eggs of about 47g, and an average of 12 to 15 eggs per clutch produced over a 12 month period.

From Asia came clear report of FP R&D effect. **Rangnekar** (8) and **Nayak** (16) informed that the major contribution of FP research in India has been to develop 'low input varieties of birds (synthetics/hybrids)' that look like indigenous birds and need low inputs. The Indian Council of Agricultural Research-ICAR (as the nodal research agency) has, over the years supported the Central Avian Research Institute (CARI) in the development of the following breeds: Nirbheek (Asil x Naked neck), Shyama, Debendra, UPCARI, HITCARI (Aseel x CARI Red); the Project Directorate on Poultry to develop Vanaraja and Gramapriya. The Central Poultry Development Organization of the Government of India has also developed Kalinga Brown, Chhabro and Colored Crosses (Kaveri). Some veterinary universities have also developed local genetic resources as follows:

a) Sri Venkateswara Veterinary University, Rajendranegar, Hyderabad, Tirupati developed Rajasri;
b) Karnataka Veterinary, Animal & Fisheries Sciences University, (KVAFSU) developed Swarnadhara, Raja II, Giriraja and Girirani ;
c) Kerala Agricultural University, Mannuthy developed Gramslakhmi, Gramrshree and Krishipriya;and
d) Tamil Nadu University of Veterinary and Animal Sciences (TANUVAS) developed Nandanam 99.

Some private organizations in India have also developed and marketed birds suitable for FP, e.g.:

a) M/s Kegg Farms, New Delhi developed Kuroiler;
b) Dr. Yashwant Agritech Pvt. Ltd. Jalgaon, Maharashtra developed Satpuda Desi and
c) M/s Indbro Research and Breeding Farm Ltd., Hyderabad developed Rainbow Rooster

These varieties were recommended for distribution under government schemes for development of family poultry. Research for developing low cost housing based on local material was also done and was most welcome by family poultry producers in India.

Similarly, in Pakistan (**Khan**, 17), the development of new breeds of chicken was one of the major research areas in the 1960's; and in Sri Lanka (**Gamage**, 24) local breeds with different body sizes were developed, i.e. Giriraj and Vanaraj. **Chowdhury** (28) gave examples of FP research done in Bangladesh to include nutritional supplementation of home-made balanced feed for indigenous laying ducks to improve egg production. He pointed to research in progress on supplementation level during scarcity of the Scavengeable Feed Resource Base (SFRB) and on the nutritional requirements of common indigenous chicken in confinement up to 12 weeks. **Singh** (47) was able to conclude that FP research has contributed significantly to the changes and development of (i) Scavenging systems, (ii) Semi-intensive system and (iii) Small-scale intensive system. Since the improvement in each system opens the way for new challenges, further research is required for the sustainability or further development of each system.

Kaphle (1) thinks that some changes, e.g. increasing flock size make old R&D methods obsolete and points needed research towards marketing and commercialization. **Uwizeye** (11) concurs and listed the following as areas important for FP research to contribute to poverty reduction: marketing flows, the fixation of price, permanent availability of poultry products on market, reduction of intermediaries in the value-chain.

Gilchrist (13) wants to refocus FP research from specialized professional areas (such as genetics, health and nutrition) into the more generalized area of project planning. He listed research topics that are no longer needed to include: indigenous breeds (not the responsibility of development aid funds), local feed ingredients (whose composition is known and thus their nutritional value can be assessed) and specialized vaccines (since effective commercial vaccines are available). See debate with Eric Fermet-Quinet on vaccines later.

Khan (17) says doing FP research is not a priority because things are assumed to be available for indigenous chickens and it is assumed that everything is already known from keeping commercial chickens and so, doing research on non-commercial (i.e. scavenging) poultry is less favoured by the commercial poultry companies, the major employers of graduates in (animal) poultry science. He alludes to the shortage of publishing outlets for such basic FP research and points to the lack of collaborative research in family poultry science / production / breeding / nutrition / veterinary / economics/ social science as major bottlenecks to FP development.

3.2. The cost and opportunities of family poultry development for livelihoods.

Leading Questions:

- What is the socio-economic importance of family poultry production?
- Food security and conservation of poultry genetic resources: the main roles of smallholder family poultry production systems?
- Does family poultry represent a sustainable source of income?
- Does family poultry alone have the capacity of improving the livelihoods of poor households?

- Does family poultry enable the poorest households to take the first step towards breaking out of poverty?
- Why should development organizations invest in family poultry rather than in other livestock activities?
- Genetic resources, feed, and animal health - which of these areas allows the highest degree of improvement, at a lower cost?
- Is family poultry development easier to achieve than that of the other livestock species reared by smallholders?
- Will the global shift towards intensive livestock production systems reduce the resources allocated to family poultry development?
- Meat and eggs- what is their respective importance to livelihoods?
- What is the willingness of family poultry producers to take risk in innovations?
- What are the risks of innovation? Does the importance of family poultry change in rural and urban households?
- Are investments in family poultry profitable?

The conference participants indicated that this subtopic canvasses a mute point which was self evident or that there has not been enough data collected to make hypothesis or draw conclusions. Hence the leading questions posed by this subtopic should form the basis for future research.

Kaphle (1), writing from Canada, highlights the dim prospects for livelihoods thru FP due to diseases, high cost of feed materials, reluctance of younger generations to continue with farming or to live in the rural area. He holds out cooperatives as the only way FP can contribute to livelihoods. **Rangnekar** (5), writing from India, maintains that there is a strong linkage between FP and livelihoods. He observes how quickly families re-stock their flocks after these get wiped out by calamities like floods, earthquakes or disease epidemics. He insists that FP contribution to family "nutritional security', ranges from "small" to 50%. From this view point comes his assertion that the current emphasis on hybrids distribution for FP development is "killing" local genetic resources because the supply of chicks of new varieties (synthetics or hybrids) developed by Government or private units is heavily subsidized but there is no support for the traditional family poultry system itself and the indigenous birds.** See Nayak's comments later.

Ekoue (20) reminds us that successful transfer of improved technologies usually require training and results in a practical demonstration of success. FP alleviates poverty via improvement in livelihoods as demonstrated by the local name "koklo" for the chicken in a local language in south Togo which depicts it as one that lifts out of poverty. **Swatson**, (22) wisely cautions that households must be responsible for their livelihoods, they must raise the necessary resources, organize the production of the chickens or chicken products (i.e feathers) as a special product that few people have and many want. He mentions an opportunity that exists in a pilot project in KwaZulu-Natal for associations of women from rural households to supply locally grown indigenous chickens to feeding schemes in targeted schools. **Uwizeye** (11) noted that branding and regular supply of FP products will be important for livelihoods while **Gilchrist** (13) wanted a planning approach to livelihoods development.

3.3. Is Family Poultry competing with or complementing commercial poultry systems?

Leading questions:

- Household consumption vs. commercialization of family poultry - which is best?
- Can family poultry play an important role to meet the protein needs of the growing human population?
- What are the strengths and weaknesses of family poultry compared to commercial poultry production?
- Can family poultry keepers be competitive on the market?

- Are higher food-safety standards achievable in family poultry production systems?
- Is family poultry consumption decreasing with rising per capita incomes, urbanization and Westernization of diets?
- Which of the following options is more promising in a developing country context: Low input / low output system (family poultry) or high input / high output (large commercials)?

Governments and commercial poultry industry in many developing countries are asking this question because commercial poultry is seen as very important in the agricultural sector in such countries while the need to support smallholders is increasingly recommending FP for intervention by the government and even the poultry industry.
Kaphle (1) does not think that FP competes with CP in a practical business sense because the lower prices of CP restricts access of consumers to FP, which is seen as a green or organic product, to a small, rich but aged section of the population. He gives the example of "the hill station of Daunne, Nawalparasi (Mahendra Highway) of Nepal [which] is very famous for its local chickens, but now customers are shying away from that station as commercial chickens are sold in the name of local". **Teno** (3), on the other hand, posits that FP and CP compete for resources in addressing national food security but FP meets mostly socio-cultural and socio-mystical needs. Not surprisingly, he recommends very clear definition of FP and more research on small scale extensive scavenging poultry production system to steer it towards economical objectives.

Uwizeye (11) thinks that since CP are cheap and available throughout the year, FP can only compete if labels and urban markets are developed for FP products in order to avoid fakery.

Yahya (12), based on his experience in Indonesia where smallholder contract farmers are "squeezed" by the CP integrator, recommends that producers of FP, which he defines as small scale intensive poultry, should form cooperatives so as to compete with or at least escape from CP integrator. **Iskandar,** (15) provides the background to the Indonesian situation. With special dishes of native chickens (called Kampung in Indonesia) remaining so popular among chicken meat consumers, particularly in small and medium restaurants, keeping native chicken has been moving towards the intensive system so as to produce larger numbers of kampung chickens that reach market weight of 700 gram to 1.3 kg in 70 - 90 days of age. Kampung chicken producers' cooperatives are developing but there are problems of getting day old chicks (DOC) due to lack of kampung chicken breeding farms as there are at most 4 private breeder companies producing kampung DOC. Some small breeding farms are working to produce a hybrid by crossing male native with modern improved brown hens. In west and central Java, consumers pay less for these hybrids compared to pure kampung chicken. The Indonesian Research Institute for Animal Production (IRIAP) has developed an improved laying type kampung chicken, which achieves 50% hen-day egg production (HDP) and it has been taken up by one of the big private breeding farms for multiplication. It is to be noted that soon after the AI outbreak several years ago legislation was passed forbidding the development of breeds that are adapted to the traditional scavenging system, especially in the populated area. **Gilchrist** (13) believes that developing a niche market for FP is better than competing with CP for the general consumers.

Rangnekar, (8), says that traditional (i.e. small scale scavenging) family poultry units do not compete with CP for feed and are likely to meet food safety and even welfare standards as compared to commercial intensive poultry farms since they do not use growth promoters. It is not proper, he maintains, to compare low external input family poultry and high external input commercial poultry farms in an ad-hoc manner since each has a role to play in the different situations and regions of a developing country. According to **Nayak,** (16), as long as FP is meant for subsistence and no surplus production, requiring organized marketing, is envisaged, there is no question of competition with CP. Slowly however, private industry is becoming interested in this

sector and it may not be long before this unorganized sector will also come under the ambit of semi-commercialized system. The commercial poultry industry in India has not criticized the Government program on family poultry, but with the food safety concerns, quality assurance norms, stringent export requirements etc., it is imperative to either keep these two subsectors segregated or devise measures to enable them to co-exist without any breach of biosecurity.

Ekoue (20) also opts for complementarity rather than competition as each type has its own production systems and different markets, e.g. exotic chickens cannot be used for ritual ceremonies and there are households that do not eat exotic chickens due to the taste. In Togo, CP only meets 1% of the poultry consumption while FP meets the rest but with demographic explosion tastes may have to change towards the CP. **Swatson** (22) asserts that with the formation of the Developing Poultry Farmers Organization (DPFO) in 2011 and with the support of the South African Poultry Association (SAPA), all farmers regardless of whether they are large commercial poultry farmers or small family poultry farmers will receive technical and possibly organizational support. This is in recognition of the fact that family poultry production systems and commercial poultry production do complement each other to meet National Protein Food Security. This is also important in the holistic control of diseases such as Newcastle disease and Avian Influenza. In other situations small-holder poultry growers are contracted to grow for the large integrated operations.

Singh (47) concurs that the large-scale commercial and small-scale family poultry sectors need not be mutually exclusive, nor be in direct competition. Indeed, the commercial sector with its wealth of human, technical and financial resources might play a major catalytic role in promoting family poultry production as a practical and viable option for poverty alleviation. **Chowdhury** (55) refers to his current research project entitled "Development of indigenous (*desi*) chicken as a meat type bird through improved nutrition and management" funded by the Ministry of Education, Bangladesh. Since demand for indigenous chicken ('*desi*') for meat purpose is between 750 to 950g body weight when they are usually priced slightly higher than double the price of broilers, '*desi*' can be raised to achieve 750g body weight at 11 weeks with a feed conversion ratio (FCR) of 3.46 and 850g body weight at 12 weeks with a FCR of 4.26 and still be profitable. Hence on a marketing level, FP and CP do not compete.

3.4. Single versus multiple (integrated) interventions for sustainable development of family poultry.

Leading questions:

- Are interventions in family poultry production systems required or are they so well adapted sustainable systems that they should continue as they are?
- Do holistic interventions (integrating health-genetic improvement-feeding-marketing) obtain better results in family poultry development than single interventions in one field?
- Single *vs.* multiple interventions - What are the costs and benefits?
- How should interventions for family poultry deal with the need for supplies and access to the market?
- Do all interventions require investment in skill building for family poultry producers?

Majority of participants did not respond to this question as most of us have learnt from experience that success comes with integrated rather than single interventions. **Rangnekar**, (5) opens the short discussion as follows: "Regarding the choice between genetic resources, feed, and animal health for highest degree of improvement, at a lower cost, it is not possible to achieve high degree of improvement with a single intervention. Mono intervention, e.g. breeding, is a reductionist approach to be avoided. FP development is as complex as for other livestock and success depends on the rapport

and credibility of the development organization". **Thakur** (14), while not disagreeing, alludes to a World Bank funded ICAR NAIP project on biodiversity conservation and sustainable livelihoods through agro-livestock interventions which focused on genetics mainly - used the local poultry germplasm with selective breeding to develop improved indigenous birds which were reintroduced back to farm families with great benefits to them.

Nayak (23) reminded us that interventions should be need-based and so may be single or multiple. However, a holistic approach may definitely be better if costs are not a constraint and it is applied on a large scale to attain economies of scale. Every intervention requires training as there is little awareness about taking care of birds, identifying unhealthy birds, reporting of unusual mortalities and often FP owners have no skills whatsoever in certain areas like marketing, exchanging birds with neighbours to introduce heterozygosity, white-ant feeding and rice-husk egg-hatching (in some areas), etc. Similarly, **Chowdhury** (60) concurs that there is no doubt that holistic interventions will yield better results but we should be aware of limitations affecting such approaches under local situations and allow local actors to assess and choose the interventions (single or multiple) accordingly in order to make them successful and sustainable.

Ekoue (30) wrote: In Togo, for example, keeping the birds alive is the first concern, then feeding and housing before phenotype and genetic characterization. A housing model (rectangular or round cage) called Improved Traditional Cage was developed through the Projet Appui à l'Elevage Familial (PAEF) implemented by the NGO Agronomes et Vétérinaires sans Frontière (AVSF) in collaboration with the research and extension service. The project started with vaccination and quickly it was realised that housing was needed since it made vaccination much easier. An isolated intervention (e.g. vaccination) is more costly since flock sizes are small compared with the existing vaccine doses. So an integrated approach is needed. Today, a value chain approach is highly recommended to bring together various stakeholders (traders, processors, sellers of ingredients, veterinary pharmacists, etc). A value chain approach makes integrated projects with multiple interventions necessary.

Dipping back to the content of the second e-conference, **Singh** (47) discussed integration in terms of enterprises. He writes: Natural feed resources for scavenging birds are being reduced day by day due to reduction in kitchen gardens, village allays, multi-cropping in the nearby fields and use of insecticides and pesticides due to which feed supplementation of the birds have become essential. A typical response is the project titled "Holistic Approach for improving Livelihood Security through Livestock based Farming System". To reduce the cost of feeding, the small flocks of scavenging chicken reared by family poultry producers were integrated with horticulture (fruits and vegetables). Earthworms obtained as the by-product of the vermi-compost were also used for feeding the birds. Further, farmers were acquainted with the importance of azolla as a natural source of poultry feed. Scavenging chickens were found to control up to nearly 60- 80 % of the insects and pests especially in guava and banana orchards and in some vegetable garden crops. Use of azolla as the supplementary feed was found to be quite effective in reducing the amount of grains required for feeding chickens.

3.5. Good organizational models for sustainable family poultry development.

Leading questions:

- How would we define sustainable development of FP?
- Family poultry is often part of integrated farming systems. Should development activities focus on improving family poultry alone or on the system as a whole?
- Which factors should be taken into account when designing good organizational models for sustainable family poultry development?

- What are the experiences from successful projects? How can their interventions be replicated or become sustainable and what are the challenges of replication in other areas?
- Does working for specific target groups (e.g. women) improve the chances of success in working for FP?
- Ways of disseminating lessons learned (successes, but also failures) from family poultry development projects.
- Which resources need to be mobilized to make projects sustainable?
- Which are the institutions that provide the best conditions for promoting a sustainable development and should be responsible for it?
- How important are Markets and the economies of scale for the success of interventions?
- What level of public funding is required to support and promote FP and for what type of interventions?
- What are promising new technologies to improve FP?

Olori, (7), raised questions on what is needed for a sustainable FP development plan: what agencies/institutions do we need to support and advise family poultry producers at the local level? Who will set up and finance them? What will be the mandate of such resource centres? What calibre of personnel is required to achieve this mandate? If we do not have such personnel, how can we go about training them? **Wethli** (10) gave two examples of his development work in South Africa trying to improve FP productivity. These reports are available through the link he provided: (http://www.farmersweekly.co.za/article.aspx?id=16282&h=Improving-the-%E2%80%98Zulu-chicken%E2%80%99).

Gilchrist (13) says that the hazards that FP planning must aim to overcome to be successful are the same hazards that were overcome by the commercial industry. These include poor genetic capability, malnutrition, disease, inadequate shelter, shortage of credit and seasonality of production. He, therefore, recommends a risk management approach for FP project development which will help to assess the likelihood of these hazards being a factor in any proposed family poultry development project and to consider appropriate technology to combat them. **Nayak**, (16) informed that the Government of India implemented across the country a national Rural Family Poultry Development program for BPL (below poverty line) beneficiaries. This scheme aims at supporting BPL beneficiary families with tapering assistance, wherein 4-week old chicks, suitable for rearing in the backyard, reared at the 'mother units' are distributed to beneficiaries in three batches of 20, 15 and 10 birds. Further, to raise the birds in a bio-secure manner, a grant of Rs. 750/- per beneficiary for night-shelter etc. is given**. Khan** (17) also informed about a regional project "Development and application of decision support tools to conserve and sustainably use genetic diversity in indigenous livestock and wild relatives" being regionally executed by International Livestock research Institute (ILRI) where, apart from Pakistan, Bangladesh, Sri Lanka and Vietnam are involved and genetic characterization of indigenous chicken is an intended outcome. Some of the activities can be seen at the individual project sites [Pakistan: http://www.fangrpk.org/; Bangladesh: http://www.fangrbd.org/; Sri Lanka: http://www.fangrsl.org/; Vietnam: http://www.fangrvn.org/] and the main project site [http://www.fangrasia.org/].

Nayak (26) then reminded participants that sustainability is defined by FAO as: *"The management and conservation of the natural resource base, and the orientation of technological and institutional change in such a manner as to ensure the attainment of continued satisfaction of human needs for present and future generations. Such sustainable development conserves (land), water, plants and (animal) genetic resources, is environmentally non-degrading, technologically appropriate, economically viable and socially acceptable".*

Olori (27) further suggested the establishment of Family Poultry Resource Centres (see **Bagnol** 41) and FP Product Marketing Board (see **Badubi** 39). In order to achieve success and sustainability, FP projects must use the Value Chain approach and Group formation as shown by PRODEBEKA (Projet de développement du petit élevage dans la Kara) in Togo (**Ekoue**, 20). Extensive field experience has shown that as **Nayak** (29) indicated, successful project models focus on specific segments of the value chain and not the entire value chain at the same time; e.g.

- Asian model / Bangladesh(BRAC) - (now extended to Pakistan, Afghanistan, Nepal, Philippines, Fiji, and African countries) - Self-Help Groups, Micro-financing
- African model / Mozambique - (extended to Kenya, Morocco, Benin, Burkina Faso) - Newcastle Disease vaccine
- Latin American model / Cuba (extended to Nicaragua, Haiti) - epizootiological monitoring and surveillance
- Danish Development Agency (DANIDA) model - extension/ training/ farmers field school
- Kegg Farms model (a private company) - supply chain
- PRADAN model (an NGO in Kerala) - market access facilitation
- Indian Council of Agricultural Research (ICAR) model– germplasm flow
- National Board for Agricultural and Rural Development (NABARD) model - techno-economic considerations and credit flow

Alders (34) clarified that the "African/Mozambique" model focused on ND control (in response to farmer priorities) but also made reference to appropriate housing, creep feeding of chicks, marketing and biosecurity. The ACIAR ND training manual (http://aciar.gov.au/publication/mn086) provides an overview of this model. **Mogbekuma Ngalo Jean-Didier** (36) wondered why only five countries have used the Mozambique (vaccine) model (Mozambique, Kenya, Morocco, Bénin, Burkina Faso) and informed that four other countries that have experimented with the model with little but encouraging results are Rwanda, Cameroun, Mali and Sénégal. Responding, **Bagnol** (37) asserts that there are positive results for the Mozambique model in three other African countries (Tanzania, Malawi and Angola) where the ND vaccine I2 is produced and used in the villages by trained community vaccinators. In Swaziland, focus is on commercialization of the semi-intensive sector by connecting vendores to buyers and by training on housing, feeding and reproduction.

Information technology and digital mapping are new technologies that FP R&D must deploy for information dissemination and surveillance, respectively in order to be successful and sustainable (**Nayak,** 29). **Rahman** (31) and **Lizarraga** (32) raised the issue of caution and disaster management, respectively in project design for sustainable FP development in order to avoid or manage tragic results.

3.6. Women empowerment through sustainable family poultry development.

Leading questions:

- Can development of family poultry make an important contribution to women's empowerment?
- What are the requirements and constraints for contribution of family poultry to women empowerment?
- Can family poultry development have negative impacts for women, for example by increasing their workload?
- Have past projects proved a positive impact of family poultry development on women's empowerment?

- While promoting family poultry what should be done to avoid discrimination based on gender, caste, and class?

Diallo (19), speaking from Mali, one of the world's poorest nations says that 63.8% are poor while 21% are extremely poor; poverty is more in the rural areas and among women. Poultry is important for reducing poverty among rural women, for food security, more protein for children, more money for the family and reduction of vulnerability. In the last years, there has been a reduction of income from poultry leading to increased malnutrition, food insecurity and inability to pay school fees, etc. Two NGOs created a strategy for Kati Circle (in Mali) to improve production and organizational capacity of female farmers. As a result, average family flock size increased by close to 50%, mortality rate reduced by 27%. Women empowerment favoured adoption of innovations which improved housing, hygiene, greater access to markets and services and the contribution of poultry to the women's income ranged from 5,000 – 35,000 FCFA. 16% of the income was used for health and school fees, 37% for food clothing and housing, 38% for income-generating activities and 9% for savings. The projects showed that FP improved living conditions.

Badubi (39) states that the development of family poultry can make an important contribution to women's empowerment as the study of Badubi et al. (2006) in Botswana showed that most family poultry are reared and cared for by women. He lists the requirements for empowerment to include: access to markets or pronounced marketing systems, feeds which will promote growth rates and should be affordable to the farmer, vaccination programs which will assist in disease control and reduce mortality rates and lastly slaughtering facilities which are up to the standard of the Abattoir and Slaughter Facilities Act. The Botswana Network of People Living with HIV/AIDS (BONEPWA) has made a big difference such that most women have been able to buy goats out of the proceeds of chickens.

Nayak (42) offers two sayings in the Telegu language to illustrate that FP in India is so closely associated with women: "What the chicken eats should never be counted because they only multiply wealth in your home, which remains with you" and "Only the daughter-in-law knows the amount earned from the poultry in the house." He informs that gender-budgeting is now mandatory for most of the GOI beneficiary-oriented schemes including FP and implementers are advised and expected to include at least 30% women among the beneficiaries in the program.

Saleque (44) observes that development of family poultry production not only enhances the cash income of women, it leads to their greater empowerment when they participate as extension workers and vaccinators. Being a poultry vaccinator not only provides self employment opportunity but also generates community respect, empowerment, self confidence and dignity among the women involved. Moreover, this practice is worthy of replication because it empowers rural women to actively participate in the rural economy both as buyers and sellers of services. Studies conducted by BRAC (the largest NGO in the world) at different periods in Bangladesh and in some African countries (Uganda, Tanzania) identified the requirements for women empowerment to include: access to training, credit, inputs and markets in a sustainable way. A number of projects in Bangladesh (SLDP, PLDP, IGVGD, and PFN) have shown positive impact of family poultry development on women's empowerment. Similar positive impact on women empowerment have been reported by projects in other countries in Asia (www.sapplpp.org). To the extent that a woman can contribute to the family income, to the same extent can she contribute to family decision making. Furthermore, money in hands of women tends to also bring educational and nutritional benefits to children.

Auvijit Saha Apu (57) reports that the following contributions of women were observed in the Bangladesh project (BDGP01) as published by SAPPLPP (2009) (www.sapplpp.org):

- 19,900 trained women vaccinators got a sources of extra income from vaccination
- Reaching out to over 2.47 million women poultry rearers in all districts of Bangladesh.
- Poultry mortality reduced from 21.3% to 7.6% in just one year.
- Annual income of poultry rearers between Tk 400 to Tk 2919.
- Family consumption of eggs raised from 43 to 186 and meat from 1.6 kg to 16.7 kg per year (SA PPLPP, 2009).

3.7. Influencing policy for family poultry.

Leading questions:

- What should be the purpose of family poultry policies?
- Is policy changing a prerequisite to steer family poultry development towards meeting the needs of the poor?
- What can policies do to support family poultry?
- How much importance has been given to family poultry in the current poultry development policies and what needs to be done to influence that?
- Have family poultry development projects influenced policy, if so, why and how?
- Have needs and priorities of the commercial poultry industry negative impacts on the policies for family poultry?
- What arguments and facts are required to achieve pro family poultry policies?
- Who are the stakeholders that should work for smallholder friendly poultry policies?
- What can international organizations and institutions do to achieve FP friendly policies?
- Is there a role of local Governments in promoting family poultry?

Badubi (39) thinks that policies should aim at: increasing productivity of FP, easy access to financing, cheap feed resources, land availability especially for women and youths, provision of slaughter facilities, and genetic conservation of family poultry. He confirms that FAO's DAD-IS has directed attention in Botswana to FP, has influenced policies and giving rise to family poultry projects which aim at poverty eradication especially in settlements. **Bagnol** (41) informs that in Swaziland, the Ministry of Agriculture (MofA) is pushing the production of indigenous chickens (Swazi breed) by promoting special markets in the capital of the regions, supporting the creation of indigenous poultry groups/associations, and training farmers in improved management practices. The MofA is also supporting a multiplication centre for farmers who want to increase their flock or start to raise chickens to be able to buy 4 weeks old chickens. Clearly, **Olori's** concern (27) is addressed by these policies in Botswana and Swaziland. Similarly, KeggFarms's enterprises with the Kuroiler (**Sharma**, 43) are made possible by the appropriate policies of both the governments of India, Uganda and Ethiopia. Kuroilers - dual purpose, multi-coloured & hardy birds produce 200 eggs (4 to 5 times more than non-descript hens), grow faster (a male Kuroiler reaches 1 kg body weight in 6 to 7 weeks compared to 18 to 20 weeks by non-descript cocks). Every year, KeggFarms distributes about 10 million Kuroiler chicks to 800,000 poor families across Uttarakhand, Uttar Pradesh, West Bengal, Assam, Orissa, Jharkhand, Chhattisgarh, Bihar and the North-eastern states through 1,500 mother units. These mother units buy 400 to 2,000 birds at a time, rear them till 3 to 4 weeks and then supply them to the nearby villages through mobile vendors on cycles. The Govt. of Uganda had imported Kuroiler hatching eggs and the Kuroilers outperformed the indigenous birds in growth rate, body weight, eggs production, egg size and hatchability which transforms to a 133% increase in meat production, 462% increase in egg production and a 341% increase in income for rural poultry farmers. KeggFarms exported Kuroilers hatching eggs to Ethiopia on the initiative of Flow Equity, a U.S. based Fund.

Némaoua Banaon (49) stated categorically that for sustainability, four types of policies are necessary: quality vaccines should be available; vaccinators should be well trained; feed for chicks should be available from local production; and there should be access to credit. With regards to the importance of FP in current poultry development policies and how to influence the policies; Burkina Faso currently supports FP by maintaining local species but there are challenges as the current supply does not meet the demand for FP leading to very high prices for live chicken (from 1,500 to 2,000 FCFA in the last five years). In the last 30 years in Burkina Faso, there has been a transition from local poultry development to national development programme. But the challenge remains the same: how to significantly reduce mortality of guinea fowls so that there will be enough adults which can be sold. There should be a movement towards industrial production of guinea keets. Now support from the World Bank is available to all stakeholders in the sector but the result may be long in coming if a more pragmatic approach is not embraced. Responding to the question of the role of local government in promoting FP, **Banaon** gave the example of the poultry fair in Poa, Boulkiemde Province which started more than fifteen years ago and has led to more than ten community poultry fairs which promote FP.

Nayak (54) made the following specific recommendations:

- *What should be the purpose of family poultry policies*?
  FP policies should work out the roadmap where the socioeconomically disadvantaged / poorest of the poor could use FP as a potent tool for livelihood and women's empowerment
- *Is policy changing a prerequisite to steer family poultry development towards meeting the needs of the poor?*
  The dynamics of poverty and resource accessibility is ever-changing; we have to possibly re-program various aspects with newer advances in technology & research and also increase participatory approaches. Policy accordingly has to adapt.
- *What can policies do to support family poultry?*
  Policies can lay the milestones and as reflected by many contributors, create an enabling environment for the FP.
- *How much importance has been given to family poultry in the current poultry development policies and what needs to be done to influence that*?
  Government of India has taken into cognizance the immense importance of FP and is implementing a program on FP. This, however, may need many interventions along the way.
- *Have family poultry development projects influenced policy, if so, why and how*?
  FP in Bangladesh, Africa and FAO programs have indeed influenced policy in India who were into the research since long (since 1990s) and were building capacity for production of low-input birds, but could launch a nation-wide program only as late as 2009. Notable is the fact that this was despite the fear of Avian Influenza in the backyard flocks- thus the importance of FP is self-explanatory.
- *Have needs and priorities of the commercial poultry industry negative impacts on the policies for family poultry?.*
  Of course, with biosecurity, food safety, international trade, SPS (Sanitary and Phytosanitary Standards) issues, there will always be a negative impact but as some contributors said they may complement each other as well. However, it is to be seen whether the urge to sustain and flourish further with higher yielding poultry would bring some transitory farmers on crossroads with commercial poultry conflicts.
- *What arguments and facts are required to achieve pro family poultry policies?*
  Livelihood, poverty alleviation and women's empowerment should be enough motivators, if properly presented and policy-makers are convinced.
- *Who are the stakeholders that should work for smallholder friendly poultry policies?*
  Central and local Government are the biggest stakeholders with social responsibilities. Self-Help Groups and NGOs (decentralized) play the crucial role in ground implementation. University and Research institutions provide important

backward and forward linkages. However, some of the private low-input bird suppliers in India are playing a vested role like vertical integrators where they ensure supply of birds to the farmers' doorstep and also the healthcare. If niche market develops they even (and in case of eggs already doing) may buy back the produce.

- *What can international organizations and institutions do to achieve FP friendly policies?*
  Networking and knowledge sharing facilitated by International Agencies across different countries and continents are proving a great boon for extrapolating and replicating the experiences.
- *Is there a role of local Governments in promoting family poultry?*
  Family poultry without help of Local Government would not sustain as all aspects from IEC to training will have to be supported by them.

Salissou Issa (56) largely agrees with **Nayak** (54) and adds his own recommendations:

What should be the purpose of family poultry policies?

- FP policies should work promote a sustainable poultry production in countries with low population (Sahelian countries).

Is policy changing a prerequisite to steer family poultry development towards meeting the needs of the poor?

- I think we should use the paradigm of IAR4D (Innovation platforms and value chains analysis in developing FP).
- In addition, we should encourage research that promote the use of thermo-labile vaccines, FP poultry workers training, local alternatives feedstuffs (grains, legume trees pods, etc.), and reduce chicks mortality in especially guinea fowl in Niger and Burkina Faso.

Have needs and priorities of the commercial poultry industry negative impacts on the policies for family poultry?

- Not necessarily. For example, in Niger a new private hatchery is supplying small family producers thus contributing to FP development.

What arguments and facts are required to achieve pro family poultry policies?

- In countries which are traditionally ruminants producers we can argue for reduction of poultry product imports, contribution to labor provision, and health aspects (less cholesterol in poultry meat).

Finally, **Auvijit Saha Apu** (57) summarises this section succinctly: "Though a lot of suggestion have been made and research has been done but attention to family poultry development in the current poultry development policies is still low. Moreover, the implementation of the policies is very much slower, below the expectation".

3.8. The future contribution of INFPD and other networks to family poultry development.

Leading questions:

- What has been achieved by INFPD? What has worked and what not?
- What should be the future priorities of INFPD?
- What actions could INFPD take to further contribute to policy change?
- What actions could INFPD take to further contribute to improving technical knowledge?
- Should INFPD collaborate more actively with other institutions or networks?

D.P. Singh (47), one of the earliest to join INFPD, gave the only response to this section. In the last two decades, INFPD and other networks have been able to turn the attention of the governments in most of the developing countries to the potential of family poultry production and development. However, the proper development of family poultry projects and programmes has not yet received the appropriate share of

government budget. It is the duty of the INFPD and other networks to support and boost further growth of family poultry research and development by disseminating the updated global technical knowhow and developing the needed capacity.

3.9. Extra Discourse on Vaccine and Vaccination

Taking off at a tangent from subtopics 4 and 5, **Eric Fermet-Quinet** (45) started an important discussion about family poultry vaccination against Newcastle disease when he asserted that there is no need to be studying or evaluating new thermostable vaccines as inactivated vaccines adapted to family poultry are already available, with many brand names, from very well known veterinary pharmaceutical companies and that only one shot of these inactivated vaccines is needed for the production cycle of family poultry population. **Dibungi Luseba** (46) insisted that a thermostable vaccine (not merely inactivated) is almost obligatory for the African FP in the SADC region as, except for South Africa and Zimbabwe, a cold chain is just not possible. **Diallo Amadou Moctar** (50) referred to a 30 year experience in Mali with thermostable commercial vaccines which showed their characteristics as: affordable price, ease of application (one injection of 0.5 ml for at least 6 months), inactivated nature and thermostability, their provision in 100 doses that reduces wastage.

Mamta Dhawan (58) intervened that since ND causes huge losses to FP producers, mostly women, its control in South Asia through vaccination is paramount. There are three issues here:

- Appropriate vaccine (i.e. thermostable, small pack size).
- Awareness amongst farmers to vaccinate their flocks.
- Delivery mechanisms in place.

Despite I2 and V4 vaccines availability and use in FP in a few African and South East Asian countries, it is not allowed in India due to regulations that do not permit a foreign strain to enter the country. Indigenous ND strain (D58) was developed in Tamil Nadu University of Veterinary and Animal Science (TANUVAS), Chennai, India and field trials of pellet vaccine produced in India has so far given promising results as it is found suitable for Indian rural conditions. In order to ensure sustainable ND vaccination in FP, supply line has to be viable and each stake holder should make a decent profit to remain in the system. Where ND is endemic, vaccinations need to be carried out regularly, every three months for Lasota and every 6 months for R2B.

Eric Fermet-Quinet (59) then gave more information:

- Type of vaccine: inactivated injectable vaccines (brand names such as Itanew, Newcavac, Immopest). Good to check quality (international standards) and relevant strain (even if many cross immunity are possible). ALL INACTIVATED vaccines ARE THERMOSTABLE BY EXPERIENCE. The advice is keep in the fridge at veterinarian level, then the farmer can use it within 2 weeks if kept in a cool place (e.g. water pot).
- Injection, is the easiest way. Everybody can make an injection in poultry breast muscle.
- Easiest dose to inject is 0.5 ml because most syringes have this type of graduation (better than 0.3 ml which will need an insulin type syringe)
- A single shot, without any booster, is enough to protect the flock. It is given ideally 2-3 months before the epizootic season (usually windy or cold season). All poultry more than 1-2 months old are vaccinated. The immunity last at least 6-8 months. 2 injections per year may be given for mature cocks and hens.

The strategy of implementation which is successful and sustainable is for the veterinarians to buy and sell the vaccines to farmers which have been sensitized and trained to do vaccination on their poultry and those of their neighbours /village /community. The only public cost is massive advertising and communication. Usual cost

to the farmer is around 0.1 USD/bird. It is very profitable as mature birds are usually sold at around 3 USD. In addition, reduce mortality of chicks by protecting them against predation.

3.10. Closing

Sujit Nayak (61) had the last word: "This conference has made me realize that there is so much more to learn".

4. Conclusions and Recommendations.

Subtopic 1.
There was agreement among the participants that high quality family poultry research had been done, though not in all the countries, and has contributed to the development of family poultry programmes in India, Bangladesh, Pakistan, Burkina Faso, Senegal, Mozambique, Tanzania, Togo, Bolivia, Cuba and Ecuador. The development of new breeds, supplementary feeding resources and vaccines and vaccination protocols were the main achievements of FP research. It is recommended that governments, the poultry industry and NGO should promote FPS R&D and to base FP development programmes on the results of research done within the national agricultural innovation system.

Subtopic 2.
Livelihoods based in part or whole on FPS are under threat from the accelerating pace of urbanization and changing lifestyles preferred by the youths. Ironically, FPS development schemes that are not carefully planned increase the danger of extinction of native FP breeds. For FPS to contribute more to livelihoods, cooperative activity and micro-financing that promote transformation into a business approach are recommended.

Subtopic 3.
Participants indicated that the FPS and CPS may pose dangers to one another under different circumstances. It is recommended that though the tension between the two systems may not go away, the advances made in CPS should be made to benefit FPS while the "green" nature of FPS can give CPS products more consumer acceptance.

Subtopic 4.
Interventions should be integrated. If single interventions are used, they should be sequential in an additive way: health (with housing) > nutrition > genetic intervention. A value chain approach is recommended with emphasis on market development, input supplies and training as well as access to credit and markets.

Subtopic 5.
Three different general family poultry development models – "African, Asian and Latin American" - were identified. For a successful and sustainable model, a value chain approach and group involvement are recommended.

Subtopic 6.
Women empowerment by family poultry development is most significant when women are the vaccinators and poultry advisers which brought them income for their family and prestige within the community. It is recommended that not less than 30% – 40% of the beneficiaries of FP project should be women.

Subtopic 7.
International organizations and programmes (e.g. FAO, IFAD, ILRI, World Bank, INFPD, DAD-IS) have influenced policy on FP in various countries. The right policies in India, Ethiopia, Uganda and Swaziland have resulted in their own successful FP programmes. It is recommended that modern planning tools such as risk analysis and return on investment be applied to development and evaluation of FP policies.

Subtopic 8.
The clear influence of INFPD and other networks on the development of policies and programmes in developing countries shows the need for INFPD and other networks to collaborate more closely with country level policy makers in FP policy formulation and analysis for the benefit of FP development.

5. Acknowledgements

The support of the International Fund for Agricultural Development was crucial to holding this e-conference and it is gratefully acknowledged. The superb management of the e-conference by the FAO team of Dr Olaf Thieme and Mr Giacomo de Besi made the conference run so smoothly. Major acknowledgement goes to the individual conference participants who made their accumulated knowledge and years of experience available to all. Without your input, there would have been no conference. Finally, the International Network for Family Poultry Development is acknowledged for its pioneering work in drawing attention to this important area of poultry production.

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Distribution of the contributions from the participants by country

Country	Number of messages	Message No
Australia	4	13, 18, 33, 34
Bangladesh	6	28, 31, 44, 55, 57, 60
Belgium	1	36
Bolivia	1	32
Botswana	1	39
Burkina Faso	2	21, 49
Cameroon	1	40
Canada	2	1, 11
Ecuador	1	35
France	4	3, 45, 48, 59
India	15	5, 8, 14, 16, 23, 25, 26, 29, 42, 43, 47, 52, 54, 58, 61
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Turkey	1	38
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