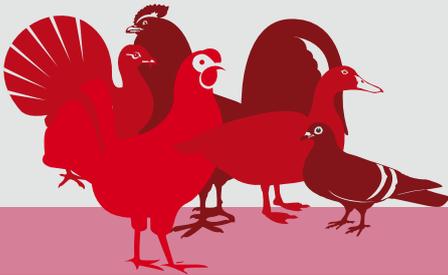


# POULTRY AS A TOOL IN HUMAN DEVELOPMENT: HISTORICAL PERSPECTIVE, MAIN ACTORS AND PRIORITIES





# POULTRY AS A TOOL IN HUMAN DEVELOPMENT: HISTORICAL PERSPECTIVE, MAIN ACTORS AND PRIORITIES

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## Preface

This paper is part of a series that describes the opportunities and limitations of smallholder poultry production. The major structural changes that have occurred in poultry production and marketing in recent decades have led to a strong and internationally integrated poultry industry. In developing countries, however, the majority of poultry are still kept by smallholders in less intensive systems. The advantages of these systems are the low levels of inputs that they require and the unique products they produce. These systems are practiced by people who have few other options and it is important that they survive as long as they are needed for social reasons, food security and livelihood support.

The paper describes that smallholder poultry production systems exist in situations with a weak institutional setting and become less competitive compared to commercial production systems with economic growth. Hardly any of the Poverty Reduction Strategy Papers prepared in recent years in many developing countries mention the potential role of smallholder poultry as a development tool. The departments of livestock services in the same countries are weak in terms of human capacity and resources allocated to reach out to the producers and NGOs and private companies also make use of smallholder poultry as a development tool or business opportunity only to a very limited degree. But there are exceptions and they are presented and discussed in the paper.

We hope this report will provide accurate and useful information to its readers and any feedback is welcome by the author and the Animal Production Service (AGAP)<sup>1</sup> of the Food and Agriculture Organization of the United Nations (FAO).

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<sup>1</sup> For more information visit the FAO poultry website at: <http://www.fao.org/ag/againfo/home/en/index.htm>  
or contact: Olaf Thieme – Livestock Development Officer – Email: [olaf.thieme@fao.org](mailto:olaf.thieme@fao.org)  
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# Poultry as a tool in human development: Historical perspective, main actors and priorities

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## **SUMMARY**

Experiences in recent years have shown that smallholder poultry production systems can be useful development tools in situations of extreme poverty and food insecurity, and that across countries and cultures traditional and small commercial flocks are often the domain of women. While positive interest in smallholder production systems is therefore warranted, the outbreaks of avian influenza since 2003 have subjected these systems to negative pressures (although there may be no objective reasons for this). The main problem is that smallholders are weakly organized (if at all) and have no representatives to lobby for them. Smallholder poultry production systems, even in normal times, exist in a weak institutional setting and with economic growth lose out to larger and modern production systems. The potential role of smallholder poultry as a development tool is mentioned in hardly any of the Poverty Reduction Strategy Papers prepared in recent years in many developing countries.

Yet, several years prior to the revival of interest in smallholder poultry production prompted by the outbreaks of avian influenza, groups of development workers around the world had seen potential in smallholder poultry production systems as tools for development. This paper presents these organizations and networks and describes their work.

## **Actors and networks**

Fighting Newcastle disease, promoting information exchange and supporting capacity-building have been the key activities around which the various organizations and networks have centred their work. The work against Newcastle disease has been led by two initiatives. One is French-sponsored and has a focus on West Africa; the other is Australian-sponsored and works in Asia and Africa (mainly the south). The French work dates back to the 1950s; the Australian initiative started their work in the early 1980s. The International Network for Family Poultry Development (INFPD) dates from 1997. It is – as the name implies – an information-exchange network; it was preceded by the African Network for Rural Poultry Development, which was established in 1989/1990.

While protection against Newcastle disease is an important foundation for other interventions, the scavenging poultry production system is also characterized by high rates

of young chick mortality from other causes – which is another big drain. Foremost in developing a strategy that enhances the survival rates of young chicks is the work that the Bangladesh Rural Advancement Committee (BRAC) and the Government of Bangladesh pioneered in the 1980s in the context of their projects for poor women. The results of this work inspired the creation, in 1997, of the Danish multidisciplinary Network for Smallholder Poultry Development, which has focused on implementing development projects, along with training, research and human-capacity development.

### **NGOs and private companies**

Comparatively few non-governmental organizations (NGOs), whether local or international, are aware of the potential contributions that animals can make to development. One exception is the *Vétérinaires sans Frontières* consortium (VSF Europa), which has chapters in ten European countries and works from the premise that livestock is very important for their survival of three-quarters of the world's poor. It has projects in more than 40 countries. Poultry work is included in their activities together with activities relating to other types of livestock. Among private companies, Kegg Farms in India is inspired by the above-mentioned work in Bangladesh, and promotes a business model that focuses on ensuring a high survival rate in young chickens.

### **Conclusion**

Small poultry flocks are likely to continue to exist as long as there are poor people. Combining the lessons and experiences of the actors that are presented in this paper provides a very solid technical platform for using smallholder poultry as a development tool that can be useful primarily for poor women and their families to make a beginning that hopefully will move them out of poverty. There is an almost perfect match between the aims of the Millennium Development Goals and the benefits that smallholder poultry production systems can offer the poor. However, this examination of the actors shows that the institutional foundation of the work is weak, that it is vulnerable, and dependent on some form or other of public funding – the French Newcastle disease work being the least dependent on public funds. In most developing countries, smallholder systems have a low priority among government professional livestock staff. The priority is also low among NGOs and commercial companies, and it is hard to avoid the conclusion that the biggest challenge for the future is in the institutional sphere, i.e. through which type of organizations can smallholders benefit from poultry as a tool in human development? Perhaps a first step will be to raise the awareness of decision-makers in national governments and donor agencies, which would seem to be logical in view of the United Nations Millennium Development Goals.

## **1. INTRODUCTION – CONTEXT**

Two sets of experiences have spurred a growing interest in smallholder poultry production. The first set is positive: in recent years, the realization has grown that poultry can be a tool in poverty alleviation and the empowerment of women – and that with this comes improved food security at the level of the producing households. This is partly because more eggs and meat are eaten within the household and partly because selling poultry products provides cash income that can be used to buy food; the poorer the household the

more likely it is that high value, eggs and meat are sold in order to buy cheaper food items (FAO, 2003a; Smith and Haddad, 2000). In short, with the right approach and institutional support smallholder poultry production falls neatly within the framework set by United Nations' (UN) Millennium Development Goals (MDGs)<sup>1</sup>.

Experiences with smallholder poultry projects or programmes demonstrate that there is an important element of self-targeting (i.e. it is the poor rather than the better off who will chose to participate). Smallholder poultry is a tool with which to reach out to women, especially poor women, and their families. It is possible to work with women and contribute to their empowerment even in very gender-traditional areas when the focus is on technical matters like poultry keeping. The women appreciate participating in the work as it provides opportunities to meet and network with other women. In other words, the women not only benefit in economic terms, but they gain social capital in livelihoods terms. These experiences have been seen in several countries and fit well with general findings on the positive results of women's empowerment (Smith and Haddad, 2000).

The other set of experiences have negative undertones. Since the outbreaks of highly pathogenic avian influenza (HPAI) in late 2003, there has been a growing interest in small commercial poultry production systems and in backyard and scavenging systems, i.e. the systems that according to FAO terminology are termed systems, or sectors, 3 and 4 (FAO, 2005). Before the outbreaks there was a widespread notion that small-scale poultry systems were systems of the past. Perceptions have changed since the emergence of HPAI, which – if nothing else – has demonstrated that there is still a lot that needs to be learnt about these systems.

### **The role of various animal species in human development**

In 2002, the International Livestock Research Institute (ILRI) published a report, commissioned by the United Kingdom's Department for International Development (DfID), entitled *Investing in animal health research to alleviate poverty* (Perry *et al.*, 2002). In accordance with the dominating concepts of the time (Sen, 1999), this study contains a table (reproduced as Table 1), which summarizes how the animal species kept by people in developing countries contribute to household asset creation; it should be noted, that assets are viewed according to the livelihoods perspective (DfID, 1999) and are hence divided into financial, social, physical, natural and human assets, the command of which to some degree are important preconditions for human development (Sen, 1999).

According to Perry *et al.* (2002), all animals contribute to financial asset formation through sales of produce such as milk, meat, eggs and live animals, and through services (mainly transport). Animals also contribute to human capital formation through the positive influence that consumption of food of animal origin has on poor people's health (see Box 1).

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<sup>1</sup> <http://www.un.org/millenniumgoals/>

TABLE 1  
**Animal species kept by the poor, and their contribution to household assets**

Species	Type of assets				
	Financial	Social	Physical	Natural	Human
Cattle, buffalo and yaks	Sales of milk, meat, hides, animals, draught power services, transport and savings instrument	Networking mechanism and social status indicator	Draught power for crop cultivation and transport	Manure for maintaining soil fertility	Household consumption of milk and meat
Camels	Sales of milk, meat, hides, animals, transport services. Savings instrument	Networking mechanism. Social status indicator	Draught power for transport	-	Household consumption of milk and meat
Donkeys and horses	Sales of animals, draught services, and transport (especially water)	-	Draught power for crop cultivation and transport (especially water)	Manure for maintaining soil fertility	Provision of household water supplies
Goats and sheep	Sales of milk, meat, hides and animals	Networking mechanism	-	Manure for maintaining soil fertility	Household consumption of milk and meat
Pigs	Sales of meat and animals	-	-	Manure for maintaining soil fertility	Household consumption of meat
Poultry	Savings instrument. Sales of eggs, meat and birds	Networking mechanism	-	Manure for maintaining soil fertility	Household consumption of eggs and meat

Source: Perry *et al.* (2002).

Only the large animals contribute to physical asset formation – as working animals – and this is associated with prestige, while there is no prestige attached to keeping small animals like goats, sheep, pigs and poultry. Small animals, including poultry (but according to the study not pigs), importantly, contribute to social capital by being means of human networking – as do camels, buffaloes, cattle and yaks.

Finally, small animals contribute to the formation of human capital (in the terminology of the livelihoods perspective), although this may be indirect. The mechanisms involved are set out in a summary, prepared by the International Food Policy Research Institute (IFPRI), of the considerable body of research that has been undertaken on gender issues (Quisumbing and McClafferty, 2006). The summary – among other points – states that:

- increasing the resources controlled by women has beneficial effects on agriculture, health and nutrition; and
- increasing women's resources helps achieve successful development outcomes.

Small-animal production, and especially smallholder poultry production, is in many

**BOX 1****Nutrient content of food of animal origin**

Poverty normally leads to a diet that is predominantly vegetarian, which studies show may be low in vitamin A, vitamin B-12, riboflavin, calcium, iron and zinc. This may lead to anaemia, poor growth, rickets, impaired cognitive performance, blindness, neuro-muscular deficits and, in the worst cases, death. Foods of animal origin are particularly rich sources of all six of these nutrients. Relatively small amounts of these foods, added to a vegetarian diet, can improve the quality of the total diet substantially (Murphy and Allen, 2003). Note that this positive effect at the low end of the income scale should not be confused with the negative effects of excessive consumption of food of animal origin that are seen in many rich countries today.

countries overwhelmingly controlled by women. Linking this fact to the IFPRI findings would imply that the benefits derived from small animals are much larger than their inherent economic value would suggest, as animals that are kept by women contribute disproportionately to the formation of human capital.

**The institutional situation of smallholder poultry**

Poultry production, whether small or large scale, is overwhelmingly a private-sector undertaking. Modern, industrial and commercial poultry production takes place in the private sector, although this does not preclude that national governments, in one way or another, support such production systems through favourable policies. The backyard, scavenging system is at the other extreme of a continuum of poultry production systems. In many countries this system accounts for the majority of poultry-keeping households and often for the largest number of birds. It is largely a private-sector system, which receives very little public support.

There are institutions in the public sphere that work in support of small-scale poultry production systems, although they are few and have limited resources. At the international level, FAO has for several years supported the International Network for Family Poultry Development (INFPD); since 2002, the INFPD has been a Working Group within the World's Poultry Science Association (WPSA). Smallholder poultry production was never a priority of the International Livestock Centre for Africa nor is it now a priority for ILRI.

At the national level, there are very few countries that have a pro-active smallholder poultry production policy, and government veterinary and animal husbandry staff are usually more interested in big farms and large animals (Ashley *et al.*, 1999). Research institutes and university animal science faculties have tended to neglect smallholders. The result is that very few countries have extension and research systems that have much to offer the keepers of small poultry flocks.

Against this background, it is the purpose of this paper to present organizations and networks that have, for some time, seen potential in poultry as a tool in human develop-

ment in the very basic sense outlined by Amartya Sen (1999). According to this definition, development is about increasing the opportunities for each individual to build up material and immaterial assets that can lead them out of poverty and enable them to lead the lives that they have reason to value. Using poultry as a tool in human development adds to the limited number of options that poor people, their governments and donors can draw upon for poverty alleviation. It is from these basic premises that the organizations and networks described in this paper have worked.

## 2. THE MAIN ACTORS

France and Australia are donor countries that for many years have supported work on smallholder poultry production. France began in the 1950s and Australia in the early 1980s. The NGO BRAC in Bangladesh, with support from the Government of Bangladesh and the World Food Programme, began to use poultry in their programmes in the late 1970s; their pioneering work has had a major influence on present thinking on poultry as a tool in human development. The forerunner to INFPD, the African Network for Rural Poultry Development (ANFRPD) was established in 1989/1990 (Sonaiya, 2004a). In both cases, FAO has been a strong supporter, as it was of earlier work. In India, a private company, Kegg Farms, has worked for smallholders for some time.

Smallholder poultry is interesting from the poverty alleviation and food security perspectives. Development work got a renewed poverty focus in the 1990s. The Berlin wall fell in 1989 and the Soviet Union collapsed in 1991; this meant that the political rivalry between the major power blocks came to an end, which, in turn, influenced donor allocations. One – short lived – notion was that the situation was ripe for the use of a “peace dividend” for human development. During the same period, the UN conducted a number of summits that focused on gender equality, population growth, eradication of poverty and other social issues, as well as on the environment. The summits culminated in the UN Millennium Development Goals, which set ambitious targets for the reduction of poverty by half by 2015. Small animals are often controlled by women and can be tools in poverty alleviation. Accordingly, the Millennium Development Goals meant a renewed interest among donors in supporting work with small animals, including poultry, in poverty eradication programmes.

In the 1990s, Danida and the International Fund for Agricultural Development (IFAD) began their support to smallholder poultry production in Bangladesh (more below). The United Kingdom’s DfID has funded several bilateral and multilateral initiatives, in which the potential of small animals, including smallholder poultry, as a tool to reach the very poor is recognized to a much greater degree than in earlier decades.

FAO, in 2001, as one response to the Millennium Development Goals launched the Pro-Poor Livestock Policy Initiative to facilitate and support the formulation and implementation of livestock-related policies and institutional changes that have a positive impact on the world’s poor. The funding for the coordination unit at FAO headquarters in Rome comes from DfID. In the United Kingdom itself, DfID funded important initiatives such as the Web site toolbox on *Smallstock in Development*<sup>2</sup> and a comprehensive publication entitled *Live-*

<sup>2</sup> <http://www.smallstock.info/>

stock and wealth creation (Owen et al., 2005), which was preceded by a British Society for Animal Science publication entitled *Responding to the livestock revolution* with the subtitle *The role of globalization and implications for poverty alleviation* (Owen et al., 2004). 2004 also saw the publication of *Livestock services and the poor*<sup>3</sup> – a study sponsored by IFAD, Danida and the World Bank, which on the basis of studies in Bangladesh, Bolivia, Denmark, India and Kenya, sought to find ways of delivering livestock services to poor people. ILRI, in 2006, published a review entitled *Livestock in the livelihoods of the underprivileged communities in India* (Rangnekar, 2006). DfID, with the Technical Centre for Agricultural and Rural Cooperation (CTA), sponsored a guide entitled *Participatory livestock research* (Conroy, 2005). In 2007, the Department of Animal Husbandry, Dairying and Fisheries, of the Government of India published a concept paper on a new initiative for the development of rural backyard poultry (Government of India, 2007).

### 3. DONORS AND NETWORKS

#### FAO

FAO is a technical organization with a global mandate, and as such has facilitated exchange of information on poultry related subjects. An exhaustive list of publications is not provided here, but examples include expert consultations on rural poultry such as the one held in Bangladesh in the 1980s (FAO, 1987) and the work on animal genetic resources, including poultry (FAO, 1986). There have been studies and reviews of production systems (FAO, 1998) and more recently, a study of the role of NGOs in poultry development (Crafter, 2004). The FAO/IAEA (International Atomic Energy Agency) coordinated research programme has studied the effectiveness of poultry vaccination strategies (FAO/IAEA, 2006). More information is available at the Web site of the INFPD<sup>4</sup>. A major ongoing information exchange takes place through INFPD.

#### ***The International Network for Family Poultry Development***

The forerunner of INFPD was ANRPD, which was established in 1989/1990 (Sonaiya, 2004a) with the objective of coordinating research and development activities in Africa. In 1997, it was expanded to include Asia and Latin America. The name of the network was changed accordingly. INFPD covers rural, peri-urban and urban, family-operated, poultry production.

While there is an element of networking in all the programmes that are described in this paper, INFPD stands out in this respect. In September 2006, the Newsletter of the INFPD was distributed to some 800 individual professionals and institutions in 98 countries. Sonaiya (2004a) inspired by Nelson and Farrington (1994) classifies INFPD as an information-exchange network. Its aims are to:

<sup>3</sup> <http://www.ifad.org/lrkm/book/english.pdf#search=%22%22Sanne%20Chipeta%22%22>

<sup>4</sup> <http://www.fao.org/ag/AGInfo/themes/en/infpd/home.html>

*“Consolidate knowledge of family poultry production and co-ordinate efforts to develop it.*

*Serve as a forum for exchange of ideas and resources, comparison of methods and evaluation of results.*

*Document results and disseminate information; and*

*Co-ordinate training programmes and develop human resources as well as to identify research and development priorities, funding sources and co-operation opportunities.”*

*Sonaiya (2004a).*

The network is supported by FAO. It is an independent voluntary association that is administered by a seven-member executive committee. Professor E. Babafunso Sonaiya, Department of Animal Science, Obafemi Awolowo University, Ile-Ife, Nigeria, has served as coordinator since the creation of the Network. The approximately 800 members of the Network comprise researchers, policy-makers, educators, staff of development agencies including NGOs, donor agencies and smallholder farmers. Since 2002, INFPD has been a Working Group within the World Poultry Science Association (WPSA). The INFPD produces two newsletters per year, which are sent electronically to its members and are available online at <http://www.fao.org/ag/againfo/themes/en/infpd/newsletters.html> (Sonaiya, 2004a).

### **The French-supported initiative in West Africa**

According to Fermet-Quinet (undateda), the French cooperation supports a West African strategy that is based on fifty years of experience – the longest among the actors presented in this paper. On the ground, the main players include Agronomes et Vétérinaires Sans Frontières (AVSF) (formerly VSF-France), the LAPROVET laboratory and, increasingly, local private veterinarians. During the early years, various priorities and subjects, such as poultry housing, feeding and breeding, were tested. These experiences showed that such interventions work as long as there is a project to fund them or a government ready to provide subsidies, but that the first and most important intervention is the prevention and control of Newcastle disease through vaccination. It is after the work on Newcastle disease is put in place that it makes sense to introduce other interventions such as improved poultry housing, feeding and breeding.

### ***The West African work has Newcastle disease vaccination as its priority***

For Newcastle disease vaccination to be financially and institutionally sustainable, the emphasis has to be on geographical areas where the farmers have access to the market, because without a market and the associated cash income the farmers will not be motivated to pay for the vaccination and without this motivation the programme cannot be sustained, as vaccine has to be charged for by private veterinarians and village poultry vaccinators. The strategy is realistic in the sense that in practically all countries where work with smallholder poultry is relevant as a tool in human development, the government veterinary service cannot reach out to the small backyard producers and government subsidies will not be available. This institutional challenge affects all the actors that are described in this paper and very few have found organizational and financial solutions to the problem.

The French strategy leaves unanswered the challenge of reaching the poultry keepers in remote areas where there is no market access.

Where Newcastle disease vaccination is concerned (Fermet-Quinet, undated<sup>b</sup>), the commercial laboratory LAPROVET<sup>5</sup> is a key actor, and has worked for many years with the inactivated ITA-NEW vaccine – at an application rate of ten to twenty million doses per year, depending on the situation in the market – in sub-Saharan Africa, mainly West Africa. The vaccine is distributed in 100 dose bottles. A criticism levelled against commercial vaccine distributors in many countries is that bottles with larger doses, say 1 000, are impractical to use under village conditions. This is because the number of birds at a given location will be comparatively small. Thus, bottles with a large number of doses lead to wastage, which makes the vaccination comparatively expensive, as the entire bottle needs to be paid for even if all the vaccine is not used. In fact, Minoungou (2007) argues, on the basis of experience in Burkina Faso, that there is a need for even smaller bottles (20–50 doses).

### **Private veterinarians play a key role**

The system for field implementation is led by private veterinarians. It is a system that aims for private and sustainable financing. Apart from private veterinarians, it involves trained farmer vaccinators, full cost recovery and massive radio broadcasting. This work was, or is, carried out mainly in West Africa, in countries such as Burkina Faso, Mali and Togo, but in 2005 the African Union Inter-African Bureau for Animal Resources (AU-IBAR) started to disseminate the methodology in East Africa.

#### BOX 2

##### **A Case from Burkina Faso: identification, training and equipment of vaccinators**

The three personal criteria for selection of farmer vaccinators

- The farmer must be a model farmer, be married and have a bicycle.

The geographical and poultry criteria

- Every vaccinator must have at least 10 000 head of poultry in his area of operation – his village and surrounding villages within a radius of 15 km.

Other diseases

- The vaccinators are trained to control Newcastle disease and other diseases such as fowl pox, salmonellosis and trichomonosis in guinea fowls.

Equipment

- At the end of the training, every vaccinator receives a small icebox, one syringe, two needles, one small bottle of vaccine and one box of dewormer medicine.

Achievements

- 35 vaccinators have been trained to work in 126 villages with 3 790 households, 30 500 persons and 700 000 fowls.

Source: Minoungou (2007).

<sup>5</sup> [http://www.laprovvet.fr/tropical\\_2\\_eng.html](http://www.laprovvet.fr/tropical_2_eng.html)

**BOX 3**  
**Results from the evaluation of the**  
***Project d'appui à l'élevage familial dans les cinq régions du Togo***

This project aimed to: (i) strengthen the veterinary network; (ii) support the development of a sustainable technical service; (iii) improve poultry husbandry practices; and (iv) support poultry producer organizations.

Results: 649 village vaccinators received refresher training and 753 were trained for the first time. In 2002, each vaccinator on average vaccinated 1 226 birds per year against Newcastle disease and obtained an income of 46 euro. In 2003, this figure rose to 60 euro. The veterinarians earn more. On average, each of the 13 veterinarians earned 351 euro in 2002, which increased to 562 euro in 2003. Less quantifiable, but important, were the benefits obtained by the farmers as a result of the training in poultry husbandry that they received from the village vaccinators and the poultry houses that were constructed.

*Source: Tchayiza and Tchabode (2005).*

It is private veterinarians<sup>6</sup> who distribute the vaccines and train the farmers to vaccinate their own poultry, those of their neighbours and, if possible, the poultry in the nearby villages. The private veterinarians, as well as the vaccinators, are encouraged to expand into other activities such as the sale of drugs. The findings of an evaluation of a project in Togo (Box 3) illustrate the process.

The system appears to be robust, as illustrated by events in Togo, Mali and Senegal where government and donor-funded, subsidized vaccinations did bring down LAPROVET sales for a few years, but when the projects closed the LAPROVET sales recovered (Magand, 2007).

***The role of national governments and international donors***

Within the French strategy, national governments and international donors have a role to play in getting the process started. This involves: (i) developing the initial three-year vaccination plan for a well-defined geographical area or the country as a whole; (ii) deciding on, financing and implementing an initial information campaign; (iii) deciding on which vaccine to use among those that are already locally available; (iv) the logistics of getting the vaccine produced or procured in sufficient quantity and quality; and (v) the training and logistics that go with the first rounds of vaccination, which may involve international technical assistance. Finally, the government and the donor agencies have to bear the initial cost of radio messages, the distribution of leaflets for veterinarians and farmers, and the training of the veterinarians in the methodologies to be followed when the Newcastle vaccination campaigns become routine.

<sup>6</sup> Apparently as a result of structural adjustments that cut down on the number of government employees.

### **The Australian-supported initiative**

Several noteworthy events preceded the establishment of the present Australian-based International Rural Poultry Centre (IRPC) and the work on Newcastle disease in village chickens that has been its main focus<sup>7</sup> (in the early years conducted mainly by Australian groups based at universities or research institutes with support from the Australian Centre for International Agricultural Research (ACIAR)). Newcastle disease was first described in Indonesia by Kranveld (1926 as cited in Copland, 1992), while it was a year later that information on the isolation of the virus was published (Doyle, 1927 as cited in Copland, 1992). In 1966, avirulent strains were recognized in Australia, and this formed an important background to the vaccine development work for village chickens. Professor Peter Spradbrow of the University of Queensland – who was for several years a leading scientist on the subject – has provided the following summary of what this meant and what subsequently unfolded.

*“Unusual, avirulent strains of Newcastle disease virus have been recognized in Australia since 1966. The first isolate, strain V4, was later developed as a commercial vaccine. When the Australian Centre for International Agricultural Research (ACIAR) was founded an initial project (in 1984) was to develop a Newcastle disease vaccine suitable for use in village chickens. The first trials, conducted jointly by the University of Queensland and the Universiti Pertanian Malaysia, used variants of strain V4, artificially selected for enhanced heat resistance. Following successful laboratory and field trials, ACIAR supported a regional approach with confirmatory studies in Indonesia, Philippines, Thailand and Sri Lanka.*

*In the initial trials V4 vaccine was presented to chickens on food. This was a concession to the lack of physical control over the chickens at the time. Eye drop vaccination has proved more effective and is now advocated where husbandry conditions are favorable.*

*When V4 became a commercial vaccine a new vaccine strain was required for village use to avoid legal complications. ACIAR sponsored the development at the University of Queensland of a new vaccine master seed. The result was strain I-2, another Australian avirulent virus that had properties, including heat resistance, similar to V4. The master seed, controlled by ACIAR and held at the University of Queensland, is available without cost to developing countries.*

*Tests with the heat resistant vaccines V4 and I-2 have been undertaken in many countries in Asia and Africa. Some of the countries have adopted one or other of these vaccines and produced them on a large scale. Vietnam is a particular example where local initiative has seen full exploitation of the vaccine”.*

*Spradbrow (2005).*

### **The Australian Centre for International Agricultural Research)**

The ACIAR that Professor Spradbrow refers to in the above quote was a new organization.<sup>8</sup> The Australian government established ACIAR by an act of parliament in 1983 with the

<sup>7</sup> The important work on the scavenging feed resource base is described with below.

<sup>8</sup> The following is based on personal information from Dr John Copland, a long-term ACIAR staff member.

purpose of assisting collaboration between scientists in Australia, Asia and Africa. While the research and development priorities of ACIAR are set by the Asian and African countries via consultations and exchange of ideas, the focus from Australia's point of view is the smallholder, poverty alleviation and gender equity. Newcastle disease control in many countries in Asia and Africa has important smallholder, poverty alleviation and gender-equity dimensions. The basis of the collaboration and the choice of projects is Australia's comparative advantage in selected areas – Australia has a strong animal health community, and virulent Newcastle disease is an exotic disease to Australia. Specifically, it was the University of Queensland and Professor Spradbrow, who provided the Australian scientific lead in a series of Newcastle disease control projects over a decade.

#### **Collaboration between Australia and Malaysia.**

The collaboration between University of Queensland in Australia and the Universiti Pertanian, Malaysia was important in the early years of the research on Newcastle disease vaccine. A vital aspect of the background on the Malaysian side was that Dr Abdul Latif Ibrahim from the Universiti Pertanian Malaysia as a young scientist in 1976 received a research grant from the International Foundation for Science<sup>9</sup> to study ways of improving existing Newcastle disease vaccines, which he felt provided imperfect protection against the disease. With the support from the International Foundation for Science, over a period of four years, he succeeded in isolating two new clones from the virus and preparing stable new vaccines.

In 1983, as a result of this research, Dr Abdul Latif Ibrahim attended the Fourth Conference of Institutes for Tropical Veterinary Medicine in Florida. During this course of this event he met with a representative of the recently created ACIAR. This, in turn, in 1984 led to the important Australian–Malaysian Project: *Vaccination of Malaysian village poultry with an avirulent Newcastle disease virus*. This was a joint project between the Universiti Pertanian Malaysia and the University of Queensland. The results are available in the form of the proceedings of a workshop held in Kuala Lumpur in 1987 (Copland, 1987).

A successor to this project followed – *Control of Newcastle disease in village chickens with oral V4 vaccine*. This, like the first project, was collaboration between the Universiti Pertanian Malaysia and the University of Queensland, but also involved scientists from other institutes in Malaysia and Australia and included work in Thailand, the Philippines, Indonesia and Sri Lanka. The results of this work have also been published (Spradbrow, 1991).

With time, it became apparent that there were other problem areas that were significant for increasing smallholder poultry production. The Australian work expanded to address these areas, which according to Copland and Alders (2005) comprise: (i) description and quantification of the scavenging feed resource base of low input/low output systems; (ii) development of gender-sensitive extension materials and methodologies suitable for use in remote rural areas in Asia and Africa; and (iii) the development and registration of a new duck plague vaccine in Viet Nam.

<sup>9</sup> International Foundation for Science (IFS: [www.ifs.se](http://www.ifs.se)) is an international research foundation with headquarters in Stockholm, Sweden, which supports young researchers in developing countries.

TABLE 2  
Key components of a Newcastle disease control programme

Component	Australian	French
<b>Vaccines</b>		
Vaccine technology and distribution mechanism	NDV4-HR is commercial and sold from Malaysia and Australia. I-2 is distributed to laboratories for local manufacture in the countries. Both are live and thermostable	The inactivated ITA-NEW vaccine is commercially produced in Italy. It is very consistent in terms of the high immune status it gives the chicken (Bessin, 2002)
Number of vaccinations per year (Alders et al., 2002a; LAPROVET et al., undated)	3 to 4	1 to 2
Way of administration (Bell, 2001)	Eyedrop (easy in the village, but training needed)	Injection (requires more trained vaccinators)
Thermostability	2 months at 26 °C, 2 weeks at 37 °C, 24 hours after reconstitution (double dose needed) (Alders et al., 2002a)	2 weeks at 30 °C (G. Magand, personal communication).
Type of vaccine	Live, I-2 vaccine can be produced locally, best in SPF eggs and sometimes in non-SPF eggs (Young et al., 2003). Production in non SPF eggs is against OIE guidelines (OIE, 2004)	Inactivated in oil emulsion (titre before inactivation: 108 EID50 per dose; LaSota strain) (G. Magand, personal communication)
<b>Communication and Information</b>		
Effective extension materials and methodologies that target veterinary and extension staff as well as community vaccinators and farmers	Manuals for farmers, trainers and laboratory workers have been prepared and can be downloaded from the Internet: <a href="http://www.aciar.gov.au/search/funnelback/Newcastle">http://www.aciar.gov.au/search/funnelback/Newcastle</a>	Manuals for farmers, trainers and a CD-ROM have been prepared, for private and public veterinarians, technicians, farmer associations, NGOs and development agencies. Examples of radio messages and advertising posters for vaccine and other drugs are also included. VSF-France which is the NGO most involved in this approach has prepared sets of training manuals covering these points
<b>Monitoring and evaluation</b>		
Simple evaluation and monitoring systems for both technical and socio-economic indicators	There is a section on monitoring and evaluation methods in the training of trainers manual (Alders et al., 2002b)	NGOs are contracted to assist in the training of farmers and of village vaccinators. The number and location of vaccinations were recorded and presented in the field report to the donor agencies (EU/ French Cooperation). The important data that are monitored are the number of vaccinations carried out by village vaccinators and private veterinarians and the economy of the farmers.

(Continued)

TABLE 2  
(Continued)

<b>Economic sustainability</b>		
Based on the commercialization of the vaccine and vaccination services and the marketing of surplus chickens and eggs	Through government channels. Although it is recommended that the vaccine be introduced to farmers through field trials for which farmers may be compensated, economic sustainability is given importance. However, there is dependence on government and a need for solutions involving private-sector or civil-society partners	Through private channels: private veterinarians and village vaccinators are already sustained. Economic sustainability is very high on the agenda. The French laboratory Laprovet has worked commercially for more than twenty years on Newcastle disease vaccination in Africa. <sup>10</sup> Sales are the best indicator of success
<b>Support and coordination</b>		
By relevant government agencies for the promotion of vaccination programmes	Depends on initial and perhaps mid-term government and donor support and coordination	Depends on initial government and donor support and then aims to have the private sector continue the work.

### Comparison between the French and Australian supported initiatives

There is much that could be written about the technical aspects of French and Australian supported work and the processes that have led to the strategies they apply today. However, while technical and biological refinements will continue, the overwhelming and urgent challenge relates to application in the field. The main concern in this section is, therefore, to identify elements of approaches that offer a basis for wide-scale field application that can be sustained.

In the Australian experience (Copland and Alders, 2005), a Newcastle disease control programme consists of five key components: vaccines; communication and information; monitoring and evaluation; economic sustainability; and support and coordination. Based on these components, Table 2 presents a comparison of the Australian and French experiences.

#### **The vaccine technology and vaccine distribution mechanisms**

The advantages and disadvantages of the two vaccines, NDV4-HR and I-2, are discussed in Alders and Spradbrow (2001). Both vaccines are live and thermostable vaccines that reduce the problems associated with inadequate cold chains in the field. A key consideration when deciding which vaccine to use is the foreign currency situation in the given country, as this greatly affects capacity to acquire and distribute the vaccine. The NDV4-HR vaccine is a commercial vaccine that is available from either Malaysia or Australia (Alders and Spradbrow, 2001) and requires foreign currency. The I-2 vaccine master seed is prepared at the John Francis Virology Laboratory, School of Veterinary Science, University of Queensland (FAO, 2002) and from here it is distributed, paid by the Australians, to laboratories in developing countries with no foreign currency requirements on the part of the recipient country.

<sup>10</sup> [http://www.laprovet.fr/tropical\\_2\\_eng.html](http://www.laprovet.fr/tropical_2_eng.html)

However, to reduce the cost of production in local African laboratories, I-2 vaccine is produced in some cases from “clean eggs” instead of from specific pathogen free (SPF) eggs. The rationale behind this is that possible local contaminants of the eggs belong to the same community as those already present in the farms vaccinated with I-2 (local microbes). Three problems can rise from this method: (i) a unique and homogeneous germ population is not always certain as it does not account for regional diversity; (ii) “clean eggs” mean eggs coming from apparently healthy flocks – there are, however, asymptomatic but potentially pathogenic germs; and (iii) with live vaccine, the absence of purity is a wide open door to uncontrolled germ dissemination. Increasingly severe quality control and quality assurance regulations worldwide mean that the continued use of this type of vaccine is very questionable. It also seems difficult to impose good manufacturing practice (GMP) facilities in African laboratories – for Newcastle disease vaccine production requirements, see the World Organisation for Animal Health (OIE) guidelines at [http://www.oie.int/eng/normes/mmanual/A\\_00038.htm](http://www.oie.int/eng/normes/mmanual/A_00038.htm).

The French programme for the development of village poultry (now development of animals) (PDAV)<sup>11</sup> established an agreement with the commercial veterinary drug distributor Laprovvet to adapt the bottling of the inactivated Italian vaccine ITA-NEW, which was known for its relative thermostability. One problem with most commercial dealers is that they supply the vaccines in bottles that may suit commercial farms, but which are too large for village requirements, the special feature of Laprovvet’s supply is that the vaccine comes in small bottles containing 100 doses, and is thus suitable for village conditions. According to Laprovvet, 15 million village chickens, primarily in West Africa, are vaccinated annually using the ITA-NEW vaccine (LAPROVET, 2007). The French programme as implemented in Mali, Senegal and Burkina Faso, is very practical and protective, with just one vaccination required per year – administered before the season of Newcastle disease outbreaks – which is a real advantage given the difficulty involved in gathering the scavenging chickens in a village. It is an approach that may deserve to be tested outside West Africa.

### **Communication and information**

Both the French and the Australian programmes see communication and information as important, and have developed training manuals. AVSF recently published a CD-ROM<sup>12</sup> containing manuals for farmers and training facilitators, and radio messages about village poultry, which is given free of charge to other collaborative agencies. The non-profit Kyeema Foundation is the organization now behind the Australian International Rural Poultry Centre. Its Web site<sup>13</sup> carries manuals for laboratory workers and for training of trainers as well as farmers, which are available for free download. Those behind this organization include people who have supported the Australian work from the beginning and who want to see it continue after the early research phase supported by ACIAR has ended.

<sup>11</sup> PDAV was Programme de Développement de l’Aviculture (poultry) Villageoise from 1978 up to around 1995; it then became Programme de Développement des Animaux (animals) Villageois. The main focus is on poultry, but it extends to other short-cycle village animals (Eric Fermet-Quinet, personal information).

<sup>12</sup> [http://www.avsf.org/uk/article.php?rub\\_id=53&art\\_id=485](http://www.avsf.org/uk/article.php?rub_id=53&art_id=485)

<sup>13</sup> <http://www.kyeemafoundation.org/>

While the French emphasised a focus on the private sector (i.e. the farmers and the private veterinarians and technicians) from the beginning, the Australians in their manuals stress the enhancement of technical competence and proper communication with the people keeping the birds; accordingly, the manual on farmer training has a section on gender in which the importance of ensuring that women's perspectives are taken into consideration when choosing the location and timing of the training is stressed. These points are not made in the French material. The communication and extension experiences generated during the work on Newcastle disease are now used in the work on HPAI conducted by the Australian International Rural Poultry Centre (Alders and Bagnol, 2007).

Both programmes have done much to develop methods for outreach (extension) to farmers. The difference between the two approaches is that while the Australian approach stresses *method*, and specifically the participatory extension methods inspired by Chambers (1991) and Sriskandarajah *et al.* (1989), the French approach stresses the *organizational* or the *institutional* aspect, i.e. the vaccination work should be organized around private veterinarians and auxiliary veterinary assistants. The farmers should be ready to pay for the vaccination from the beginning and accordingly, it is farmers with focus on a market where they can earn income from their poultry who should be targeted rather than farmers in remote locations far from the market. In comparison, the Australian approach stresses the point that the farmers are introduced to the benefits of Newcastle vaccination through a field trial (chapter 9 in Alders and Spradbrow, 2001).

*"A twelve months field trial in Mozambique that compared three routes of administration: eyedrop, in drinking water or as an oral drench showed a clear superiority of the eyedrop method in terms of the change on the chicken population and this was the method that the farmers preferred although it involved catching of the birds compared to administration in the drinking water."*

*Alders and Fringe (1999).*

#### BOX 4

##### Key topics for inclusion in field trial extension activities

"It is essential that certain issues are discussed prior to initiating a field trial.

- Emphasise that it is a trial that is being undertaken and not a vaccination campaign. The outcome of the trial cannot be predicted and not all groups will necessarily demonstrate adequate levels of protection to the disease.
- A form of compensation should be discussed prior to starting, e.g. offer to vaccinate birds free of charge, using the route of administration found to be most effective for a certain period after the trial finishes.
- In order to remove the possibility of bias, treatment groups can be allocated to different farmers or different communities using a lottery system conducted during a community meeting where representatives of all groups are present."

*Source: Alders and Spradbrow (2001).*

### ***Monitoring and evaluation***

The manual for trainers prepared by Alders *et al.* (2002b) has a chapter (chapter 4) on monitoring, evaluation and ongoing education of community vaccinators, which stresses the importance of feedback. The chapter highlights the significance of the participatory process to monitoring and evaluation, and includes a table with a list of important indicators to be used to evaluate the efficiency of the work. The French manuals do not contain any sections on monitoring and evaluation, but papers prepared by programme staff indicate that the number and location of vaccinations are monitored (Bebay, 2004). Perhaps there is a case for the Australian approach to learn from the French approach, as success must lie in use by farmers who have to acquire the vaccines commercially (as in the French approach).

### ***Economic sustainability***

#### ***The French approach***

Although there is a strong emphasis in the French approach on the private sector, there are cost elements that need public financing such as the radio messages, distribution of leaflets for veterinarians and farmers, and the training of the veterinarians in promotion methods. From the perspective of economic sustainability, the French approach appears to be the most robust as it builds on income opportunities for private veterinarians. The approach in recent years has been challenged by subsidized programmes in Africa in locations where in normal years there had been good commercial sales. Sales dropped while other programmes received their subsidies, but when the subsidies ceased the sales of the vaccines delivered according to the French approach recovered (Magand, 2007).

#### ***The veterinary trainers***

Experience with the French approach indicates that trainers need to be given syringes, needles and a vaccine container. There are even some programmes that have made it possible for veterinarians to acquire cold chains when they set up their business, and in other programmes private veterinarians have been paid from public funds to ensure that the campaigns and farmer training in the villages are carried out.

#### ***The farmers trained as village vaccinators***

Under the French approach, the trained poultry farmers can be given free equipment (syringe, needle) at the beginning of the programme. But to create the right attitude from the beginning, they must not be given the first bottle of vaccine free. The reason, it is argued, is that this would give rise to false statistics about achievements and would lead to abuse by opportunists who would want to be trained in order to get the free bottle of vaccine. It is argued that it is much better for the sustainability of the programme to introduce a contest for the best vaccinator (with a prize at the local, regional and national level, and interesting prizes such as bicycles and radios). An official code of conduct for village vaccinators has been established in all the countries where the approach has been applied (Burkina Faso, Guinea, Mali, Senegal and Togo).

### ***The Australian approach***

The Australian approach recognizes that a sustainable programme needs to build on full cost recovery, whether the vaccine is imported or produced in the country. However, it does not aim as directly as the French approach at full cost recovery from the beginning, it is mentioned that in many cases government or development agencies may subsidize some of the activities while the farmers pay for others (Alders *et al.*, 2002b). Most of the documents do not provide comments on the “without project situation”.

### ***Support and coordination***

#### ***Roles of government, development and donor agencies***

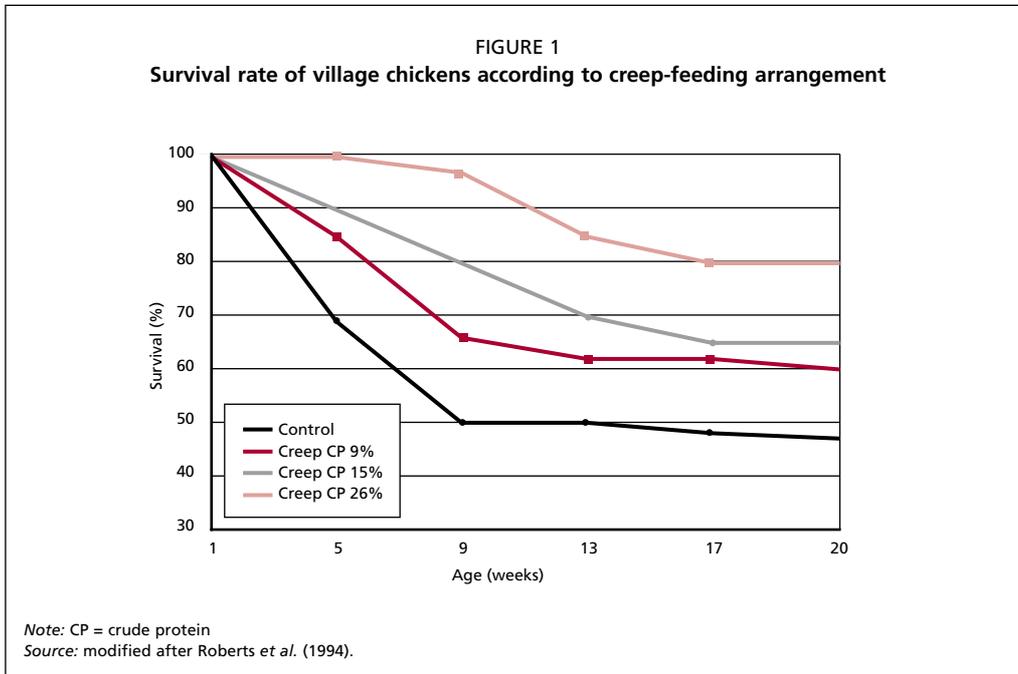
In both the Australian and the French approaches, the national government, and the international donor and development agencies play critical roles in getting the process of Newcastle disease vaccination moving. This includes: (i) developing the initial projects and vaccination plans for a well-defined geographical area or for the country as a whole; (ii) deciding on, financing and implementing an initial information campaign; and (iii) deciding on which vaccine to use and the logistics of getting the vaccine produced or procured in adequate quantity and quality. However, following these initial steps the French approach is more directly aimed at the private sector than is the Australian, although it must be noted that the latter had an early commercial “success” with NDV4-HR (Alders and Spradbrow, 2001). The Australian approach seems to continue to explore possibilities for reaching farmers who may not be reached via the commercial pathway. In comparison, the French approach is less reliant on public funds and may, therefore, be more sustainable, at least as long as there is commercial demand.

### **Not only Newcastle disease – protection of young chickens is another key area**

At the level of the household, there are two factors that cause heavy losses of birds in the smallholder scavenging or semi-scavenging system around the world. Newcastle disease is one and high mortality in young chickens is the other. Matthewman (1977) documented in Nigeria that the mortality in young chickens is so high that all eggs are used for reproduction, and this is true in many countries and situations. The problem is mainly a matter of nutrition and management, as will be illustrated below.

In the 1980s and 1990s, the Australians supported some pioneering work on the scavenging feed resource base in Indonesia and Sri Lanka (Roberts, 2000), an area of research that continues to engage scientists (Sonaiya, 2004b). However, the early research demonstrated that the scavenging feed resource base is limited and of low quality. This conclusion was illustrated by data that showed that poor nutrition led to very high rates of mortality in young chickens and – conversely – that proper supplementation, combined with protection in the early stages of life, led to high survival rates. The points are illustrated in Figure 1.

The results presented in Figure 1 show that without supplementation, 50 percent of the chickens die within the first nine weeks of life under scavenging conditions, the primary cause being the attrition caused by an ongoing shortage of feed which eventually leads to starvation (Roberts, 2000), and that survival rates progressively increase when the protein



content of the diet is increased from that of the control diet up to 9 percent, 16 percent and 26 percent (Chandrasiri *et al.*, 1994; Roberts *et al.*, 1994).

Building on this understanding, Sarkar and Bell (2006) reported on recent work with creep feeding to chicks in Noakhali, Laxmipur and Feni districts in the south of Bangladesh. The demonstration involved 397 broody hens in 168 households, and although there was no control group, the results show high survival rates – an average of 93 percent up to the age of three weeks and 88 percent up to ten weeks (Table 3).

The key finding that there is a need to protect the young chicks and help them get over a critical phase in their lives provides a clear rationale for the Chicken Rearer component in the Bangladesh Model (see below) (Saleque and Mustafa, 1996). Chick rearing is also a focal point in the model developed by FAO in Afghanistan (Thieme, personal communication), and has subsequently been taken up by the commercial company Kegg Farms in India which targets poor rural people (Karunakaran, 2005).

### The Bangladesh work

The Bangladesh work had its formative phase during 1978–1982, when poultry keeping was identified – in the spirit of the proverb “that it is better to teach a person to fish than give the person a fish” – to be a potential source of income for very poor women who used to receive food from the World Food Programme (Saleque and Mustafa, 1996). The work was exclusively targeted at landless women and involved women in a chain of activities as vaccinators, hatchery operators, chicken rearers, feed sellers, producers of hatching eggs and producers of eggs for the market. Credit as well as marketing was integrated into the approach (Saleque and Mustafa, 1996).

TABLE 3  
Creep feeding and survival of chicks under village conditions in Bangladesh

Parameters	Total of subdistrict	Max./subdistrict	Min./subdistrict	Mean $\pm$ SD/ subdistrict
Eggs set for hatch	5 808	1 056	217	726 $\pm$ 265
Chicks hatched	5 064	1 008	181	633 $\pm$ 248
Hatchability (%)	87	95	83	87 $\pm$ 4
Chicks surviving	4 666	991	162	583 $\pm$ 247
Survival (%)	91	98	85	91 $\pm$ 4
Survival (%) up to 3 weeks	93	99	87	93 $\pm$ 3
Survival (%) up to 10 weeks	88	97	79	88 $\pm$ 6
No. of chicks/ household/month	31	46	18	31 $\pm$ 10

Source: Sarkar and Bell (2006).

There are similarities between the experiences in Bangladesh and those of the French work in West Africa (see above). In Bangladesh, as in West Africa, it was learned the hard way that protection against Newcastle disease is the first step, and that it is only after vaccination is implemented that other interventions should be introduced. The NGO BRAC has been a leader in the work in Bangladesh; Saleque and Mustafa (1996) describe how the work began with cockerel exchanges – which were a failure as the exotic cockerels either died or were sold – they were big and attracted a good price in the market. Conversely, it became evident soon after the work had started that increasing the survival rate in the existing population of chickens by controlling Newcastle disease would increase income possibilities substantially.

One significant feature of the Bangladesh work has been the emphasis on exotic birds, but high mortality in introduced exotic pullets – even if they were vaccinated against Newcastle disease – led to the invention of the Chick Rearing Unit, which is a unit run by a woman in a village, who specializes in rearing chicks from one-day to two-months old. When they are two-months old their survival rate is much higher. As production increased, marketing was included in the work, and while there was a strong reliance on government poultry farms as suppliers of chicks in the early years, the supply is now in the hands of the NGO and the private sector with government playing a small role.

The Bangladesh work has influenced much recent thinking on how poultry can be used as a tool in poverty alleviation (Dolberg and Petersen, 2000), not least the work by BRAC; it has become common to talk of the “the Bangladesh Model”. In fact, FAO conducted an electronic conference entitled *The Bangladesh Model and other experiences in family poultry development*.<sup>14</sup> The point to note is that the work in Bangladesh is based on practical

<sup>14</sup> [http://www.fao.org/ag/AGAinfo/themes/en/infpd/econf\\_bang.html](http://www.fao.org/ag/AGAinfo/themes/en/infpd/econf_bang.html)

experiences drawn from the field; modifications are made when the dynamics of the field requires them. BRAC replicates the work in other countries such as Afghanistan, India, Sri Lanka, Sudan, Uganda and the United Republic of Tanzania. The number of countries is likely to increase. The most important lesson is the need to be both comprehensive and pragmatic, and essentially that good management is a very critical precondition for the success of a programme, but that only documentation of these activities will be able to show whether success is achieved.

### **The Danish Network for Smallholder Poultry Development**

The Network for Smallholder Poultry Development is strongly inspired by the work in Bangladesh in which poultry is a source of income for very poor women and their families (Saleque and Mustafa, 1996). It was these experiences that were drawn upon in the Danida/IFAD-supported Smallholder Livestock Development Project (SLDP) 1991–1999, which in turn acted as an eye-opener to Danish professional development staff and Danida administrators with regard to the potential of small poultry flocks as a tool in poverty alleviation (Jensen, 1998b). Thus, the project was reviewed during November 1994 by a mission fielded by Danida. The outcome of the mission's work was a very positive report, and one of the conclusions was that:

*“The poultry model developed by DLS and BRAC is indeed very interesting and holds the potential of breaking new grounds in the science and practices of smallholder and scavenger poultry production.”*

*Jensen (1998b).*

Review missions and impact surveys that followed further documented the merits of the model. One example is the study of 1 000 families of the SLDP by Alam (1997). The study reported increased consumption of chicken eggs and meat in the producing households. However, the study found the main nutritional impact to be indirect. Most of the participants in the project sold their eggs and the resulting income was used to buy other items of food such as fish, rice, milk, beef and goat meat. The findings represented a very constructive response to the criticisms levelled against livestock projects at the time – summarized by Ashley *et al.* (1999) who reviewed 800 livestock development projects and found that the work showed a bias towards large animals.

The conclusion was that small poultry units of 10 to 15 layers were very good instruments in rural poverty alleviation when compared to other programmes, certainly programmes that involved livestock, and that there was a strong element of self-targeting, as only poor people were interested in these small poultry flocks. Other events at about that time contributed to a conducive environment – the Network for Smallholder Poultry Development can be seen as a result of a number of coinciding and mutually supportive events:

- Experiences of the SLDP project in Bangladesh were positive.
- The donors' focus on poverty alleviation and gender at the time of the SLDP experiences was a strong impetus for the creation of the Network. The World Summit for

Social Development<sup>15</sup> was held in Copenhagen in 1995; it produced a number of commitments related to poverty, women and equality. It produced, for the first time, a commitment to eradicate absolute poverty. This was considered a political breakthrough, as it was the first time that governments agreed to wipe out – and not just to reduce – extreme poverty. With this came a hunt for tools – and the smallholder poultry concept proved handy.

- Scientists at the Danish Royal Veterinary and Agriculture University (RVAU)<sup>16</sup> were keen to see science play a role in the development of village poultry. During 1996, a number of meetings were held at RVAU, with Danida participation, to examine the possibilities for establishing institutional capacity and enhancing the Danish human resource base to develop and disseminate a smallholder poultry concept in other developing countries.
- The SLDP advisory team and the Danida administration included professionals with the skills needed to formulate the project's experiences and link them to higher development goals such as poverty alleviation, food security and gender.
- From the very beginning, those involved realized that there was a limited international human resource base, and consequently limited international institutional capacity with regard to smallholder poultry development, and that this would be a major constraint to replication in other countries. This realization was supported by the findings of a feasibility study undertaken in Bangladesh, India, Uganda, the United Republic of Tanzania and Viet Nam in 1997 (Jensen, 1998a).

### **Organization of the Smallholder Network**

The Network for Smallholder Poultry Development is multidisciplinary in its membership as well as in its methods of work. Its aim is a holistic approach (Riise *et al.*, 2005). Core partners that make up the Network are: (i) Danida; (ii) the Royal Veterinary and Agricultural University, which from January 1, 2007, has become the Faculty of Life Sciences under the University of Copenhagen; (iii) the Danish Institute of Agricultural Sciences, which from January 1, 2007, has become the Faculty of Agricultural Sciences under the University of Århus; (iv) the Danish Institute for International Studies under the Danish Centre for International Studies and Human Rights; (v) the Institute of Anthropology of Copenhagen University; and (vi) the University of Århus.

This multidisciplinary composition is reflected in the board and the staff of the network, and in the way that the Network perceives that the development potential of village poultry can be unlocked (see Box 5).

In practice, when activities are started in a new country, they are very open ended. The *pilot project* gives high priority to creating opportunities for testing design ideas, generating feedback, practical learning and training stakeholders. Following a pilot phase there is a multidisciplinary evaluation and plans are formulated for the specific activities to be focused on during scaling up.

<sup>15</sup> <http://www.un.org/esa/socdev/wssd/>

<sup>16</sup> From January 1, 2007 this university has changed to become the Faculty of Life Sciences under the University of Copenhagen.

## BOX 5

**“The development potential of village poultry can be unlocked by:**

- Improving the farmers’ management procedures for local poultry
- Identifying marketing opportunities for poultry products
- Identifying agents of change and commercialisation of agricultural production
- Introducing simple adaptable technologies that farmers accept
- Sustaining vaccination and animal health through public-private partnerships
- Mentoring and teaching extension staff new participatory learning skills: moving from traditional training to facilitators of change
- Supporting farmers’ organisations and facilitating their participation in providing service and input to the farming communities
- Promoting village poultry to local and national decision- and policy-makers.”

Source: NSPD Web site ([http://www.poultry.life.ku.dk/Development\\_potentials/Unlocking\\_the\\_potential.aspx](http://www.poultry.life.ku.dk/Development_potentials/Unlocking_the_potential.aspx)).

**Areas of work**

The Network involves itself in programme and project implementation as well as human-capacity development, in which the farmer field school approach is a key strategy as far as extension is concerned (see Dalsgaard *et al.*, 2005 for an experience in Viet Nam and the manuals available for downloading from the Web site of the Smallholder Network<sup>17</sup>). Research at M.Sc. and Ph.D. levels with farmer participatory components reflects the research approach. By January 2007, the Web site of the Smallholder Network lists 37 completed master’s theses and four Ph.D. theses, which can be downloaded.<sup>18</sup> As well as these activities, the Smallholder Network is involved in planning, running and producing proceedings from a series of workshops, which so far have taken place in countries such as Bangladesh, Benin, Burkina Faso, Denmark, Ghana, Kenya, Mozambique, Senegal, South Africa, Togo the United Republic of Tanzania and Viet Nam.<sup>19</sup>

In its initial years of existence, the Smallholder Network drew inspiration, funding and people to be trained from development projects in Bangladesh. Examples included the IFAD- and Danida-funded Smallholder Livestock Development Project, which ran from 1991 to 1999 with a target group of 260 000 poor women in the southwest of the country.<sup>20</sup> The same concepts and experiences characterized the Danida/Asian Development Bank-funded Participatory Livestock Development Project from 1998 to 2003, which was set to target 364 000 women and their families in the north of Bangladesh, and, finally, the Danida-funded Smallholder Livestock Development Project II in the south of Bangladesh, which included no other external development partner and which ended in 2006. The total amount allocated to these projects was US\$66 million, of which Danida contributed US\$24

<sup>17</sup> [http://www.poultry.kvl.dk/Our\\_services/Training\\_and\\_education/Farmer\\_Field\\_Schools.aspx](http://www.poultry.kvl.dk/Our_services/Training_and_education/Farmer_Field_Schools.aspx)

<sup>18</sup> [http://www.poultry.kvl.dk/Information\\_resources/References/M,-d,-Sc\\_and\\_Ph,-d,-D,-d,-,publications.aspx](http://www.poultry.kvl.dk/Information_resources/References/M,-d,-Sc_and_Ph,-d,-D,-d,-,publications.aspx)

<sup>19</sup> [http://www.poultry.kvl.dk/Information\\_resources/Workshop\\_proceedings.aspx](http://www.poultry.kvl.dk/Information_resources/Workshop_proceedings.aspx)

<sup>20</sup> <http://www.ifad.org/english/operations/pi/bgd/i280bd/index.htm>

million (Network for Smallholder Poultry Development, 2005). This implies that funding for much of the work has been comparatively liberal. However, by 2007, the Network faced a situation in which direct support from Danida stopped, and in which the future of the Network will depend to a large extent on the degree to which it can find external funding. The reasons for this situation are not particularly logical, as Danida continues to support similar networks in Denmark; it is probably more a question of rotation of key staff inside the Danida system and the resulting loss of institutional memory.

### **Development – NGOs, private companies**

NGOs are active in development in many countries, but very few NGOs get involved in livestock production as a development tool to any great degree, let alone smallholder poultry, and even if they do at field level, the top level management may not be aware (Crafter, 2004).

#### ***NGOs and private companies***

In a survey for FAO, Sally Crafter (Crafter, 2004) found 73 international and 25 local NGOs and other agencies involved in small-scale poultry production, and two international micro-credit agencies and nine local credit agencies lending to small-scale poultry keepers, and concluded that interest in the use of poultry as a tool for development was small. Crafter found interest and awareness among top-level management to be particularly limited. In many cases, the NGOs stated that they were not involved in poultry, although Crafter knew of current and past poultry projects carried out by the agency in question. In other words, the work with poultry was not sufficiently visible within the organizations for those who answered the questionnaires to know about them.

#### ***Examples of NGOs and private companies that use poultry***

One exception to the general lack of interest among international development NGOs in livestock, including poultry, as a development tool is the *Vétérinaires sans Frontières Europe* (VSF Europa) consortium, which works on the basis of the premise that for three-quarters of the world's poor, depend entirely or partially on livestock for their subsistence. At the time of writing (2007), the members of the Consortium are involved in more than 100 projects in over 40 countries. The Consortium<sup>21</sup> has members in 10 countries: Austria, Belgium, France, Germany, Italy, the Netherlands, Portugal, Spain, Switzerland and the United Kingdom. Examples of involvement in poultry projects include AVSF which works in Mali and Togo, VSF-Switzerland which has a poultry project for women in Kivu, the Democratic Republic of the Congo, and VSF-Belgium which has a project in the Comoros. AVSF has conducted several surveys for FAO in the context of the work on HPAI in Southeast Asia since 2004. There are NGOs such as BRAC in Bangladesh and BAIF Development Research Foundation in India that have large and well-recognized livestock programmes. The commercial company Kegg Farms in India has been inspired in its approach by BRAC's key component, the Chicken Rearer, who plays an important role in enhancing the survival rate of young chickens.

<sup>21</sup> <http://www.vsf.org/cgi-bin/twiki/bin/view/Public/WebHome>

Yet, it is hard to avoid the conclusion that livestock, and especially smallholder poultry, is rather invisible as a development tool, although there is evidence for its important roles in human development through the provision of important (micro)nutrients (Murphy and Allen, 2004), diversifying the diet (Alam, 1997) and enhancing food security (GuerneBleich *et al.*, 2005).

#### 4. POULTRY IN THE POVERTY REDUCTION STRATEGY PAPERS

The analysis in this paper has shown that the networks and organizations described have acquired considerable human capacity and knowledge about how to use smallholder poultry production as a tool in poverty reduction and human development. However, wide-scale application of this knowledge requires strong institutional support first from governments and second from agencies – farmer organizations or NGOs – that can do the actual implementation work. There should also be support from research institutions. Strong government support is needed to ensure a level playing field between industrial and smallholder production systems, i.e. that the industrial production system does not benefit from positive discrimination through subsidies, direct or indirect, or from the erection of barriers that exclude the smallholders from the market. In short, there is a need for proactive government in terms of policies and planning, human capital (training) and probably financial resources.

Yet, if the Poverty Reduction Strategy Papers (PRSPs)<sup>22</sup> (which heavily indebted countries have to prepare before they can obtain concessional lending) are any guide, then there is much that needs to be improved. As poultry and other small livestock are kept particularly by poor people, it might be expected that the papers would allocate a role for livestock development, but this has not been the case in most instances. In the first working paper published by the FAO Pro-Poor-Livestock Initiative (FAO, 2003b), 61 countries were examined with regard to the degree to which livestock, not to mention poultry, had been included in their PRSP papers. The conclusions were:

- that livestock is generally under-represented in PRSPs;
- that greater attention is given to commercial operations than to species and structures relevant to the poor;
- that recommendations are far too general, and therefore unlikely to lead to improved outcomes;
- that in many cases the format of the PRSP process will not lead to accurate descriptions of the situation of livestock producers;
- that despite attempts at a participatory and consultative process, recommendations are mostly central and top-down; local opinion may therefore be sought, but not incorporated; and
- that the joint staff assessment procedure does not lead to any increased representation of livestock.

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<sup>22</sup> <http://www.imf.org/external/np/prsp/prsp.asp>

## 5. HIGHLY PATHOGENIC AVIAN INFLUENZA AND THE ACTORS

The outbreak of HPAI in 2003 in Southeast Asia, and its subsequent spread to other parts of the World including Africa, poses a new challenge to smallholder poultry production. Many governments have tended to equate open, small-scale poultry production systems with easy transfer of the virus, while the closed, modern systems have tended to be considered safe. This perception is not in fact supported by research – see for example the review by Otte *et al.* (2006) which describes the traffic of virus and fomites via ventilation systems and feed in industrial systems, as well as the disease risks posed by large quantities of manure.

One result of the HPAI crisis is a realization that in the records of governments and donors alike there is a lack of knowledge regarding smallholder poultry systems. FAO has embarked in 2006 on a comprehensive review of smallholder poultry production – of which the present paper is a part. The FAO work on HPAI can be accessed on the Internet.<sup>23</sup>

Among the actors presented in this paper, there are examples of both technical work and of lobbying on behalf of small poultry keepers (or a mixture of both). Practically all the actors have assisted in spreading technical information provided by FAO through links to the FAO HPAI Web site, by conducting their own studies or contributing to national preparedness plans. This is the case in a country such as Bangladesh, where BRAC developed HPAI preparedness plans in cooperation with the government.

AVSF has conducted several studies in Cambodia, the Lao People's Democratic Republic and Viet Nam on HPAI and farmer poultry production systems (see VSF (2004) for one example). This exposure to HPAI has led the international umbrella organization for agronomists and veterinarians without borders to publish a position statement, which underlines the need to strengthen veterinary services and family livestock farming in the South (AVSF, 2006) because of the interconnectedness of the globalized world.

Another example is the Interdisciplinary Task Force on Avian Influenza created by the Danish Network for Smallholder Poultry Development, which provides technical backstopping to Danida programme countries and undertakes research on HPAI in Viet Nam.

The Australian group has advocated communication as a key to prevention and control of HPAI (Alders and Bagnol, 2007), and provides specific guidelines based on experiences with Newcastle disease.

All the networks around the actors have served as human and technical resource bases for the studies and proposals for change that have to be prepared in many countries as a consequence of HPAI.

## 6. CONCLUSIONS

In this concluding section an attempt is made to answer questions such as where have the actors made an impact, how smallholder poultry production relates to the Millennium Development Goals, where the smallholder production systems are likely to be in the future, and what is the effect of HPAI?

<sup>23</sup> <http://www.fao.org/avianflu/en/index.html>

### **Where do the actors make an impact?**

To provide an overview, the activities and contributions of the actors are summarized with respect to: (i) research, (ii) development and implementation, (iii) market development, (iv) networking, and the roles of (v) governments, NGOs and the private sector.

#### **Research**

The most outstanding contribution of research has been in the development of Newcastle disease vaccine – Newcastle disease vaccination programmes are acknowledged to be important by all the actors. The leads have come from France and Australia. Less noticed, but also very important, is the work on high mortality rates in very young chickens in the scavenging system (Roberts., 2000) and the role that correct supplementation can play in enhancing survival rates, the practical benefits of which are seen in the results reported by Sarkar and Bell (2006). This research provides a good illustration of the benefits of caring for, and even confining, very young chickens – as documented in the early work in Bangladesh (Saleque and Mustafa, 1996). Research to identify locally available and economical feed for rearing young chicks remains a priority. Although, by now, there is a substantial body of research on a number of other subjects, none of this has seen implementation to the same degree as the Newcastle disease work. Most of the other research has been conducted in the context of human-resource development, i.e. to train staff in important aspects of smallholder poultry production, and involves the documentation of options that may be pursued in training and extension programmes to increase the productivity of smallholder poultry production in the future.

#### **Development and implementation**

A considerable body of development and implementation experience has been generated on market development (see for instance Dolberg, 2008). This work has focused on the producer level, the exception being the French work on Newcastle disease vaccination, which for several years now has focused on private veterinarians and their networks of trained farmer vaccinators, with full cost recovery and massive radio broadcasting.

#### **Networking**

All the major actors have a network – and in many cases these overlap with each other. INFPD is the largest global network, as all the actors are members. Clearly, the actors are much more aware of what the others are doing and of what is generally going on in this field than they were, say, twenty years ago. With methods for, and experiences of, using poultry as a tool in human development and conducting practical participatory research and on-farm pilot activities frequently reported in the INFPD newsletter (Sarkar and Bell, 2006 is a good recent example), this network could become more pro-active in the future to lobby for the inclusion of smallholder poultry in the policies, plans and projects of national and international organizations involved in development.

#### **Governments, NGOs and the private sector**

Poultry production continues to be predominantly a private-sector activity for both small and large producers. The actors presented in this paper have documented the potential role

that small poultry production units can play in human development. There are examples from the work of international agencies, NGOs and private companies. As such, it may be argued that a core body of experience exists. However, on a global scale, the sober conclusion is that the awareness in governments, NGOs and private companies is very limited. In most developing countries, the smallholder systems have a low priority with government professional livestock staff. Priority is also low among NGOs and commercial companies. It is hard to avoid the conclusion that the biggest challenge for the future is in the institutional sphere, i.e. through which type of structures can smallholders benefit from poultry as a tool in human development? Perhaps a first step will be to raise the awareness of decision-makers in national governments and donor agencies, which would seem to be logical in view of the Millennium Development Goals.

### **Millennium Development Goals**

Small-scale poultry flocks – chicken, ducks, guinea fowl, etc – are likely to continue to exist as long as there are poor people. Much has been learned about how to improve production on the basis of the systems maintained by poor women and their families. These improvements can feed into the Millennium Development Goals<sup>24</sup> (see Box 6), as, in theory, smallholder poultry systems fit well with development objectives set out in the Millennium Development Goals such as poverty alleviation, food security, gender equality, better nutrition and income for HIV/Aids affected people, maintaining biodiversity and environmental sustainability.

### **Where the poor – and smallholder poultry production – will be in the future**

A number of countries have large proportions of poor people among their populations. Such countries may be describe in various ways: FAO uses the expression low-income food-deficit countries (LIFDCs);<sup>25</sup> the World Bank and the International Monetary Fund may talk of heavily indebted poor countries (HIPC)<sup>26</sup> or low income countries under stress

#### **BOX 6**

##### **Millennium Development Goals**

- 1: Eradicate extreme poverty and hunger
- 2: Achieve universal primary education
- 3: Promote gender equality and empower women
- 4: Reduce child mortality
- 5: Improve maternal health
- 6: Combat HIV/AIDS, malaria and other diseases
- 7: Ensure environmental sustainability
- 8: Develop a global partnership for development

<sup>24</sup> <http://www.un.org/millenniumgoals/>

<sup>25</sup> <http://www.fao.org/countryprofiles/lifdc.asp?lang=en&iso3=LIE>

<sup>26</sup> Lists of countries can be found at the webpage of the International Monetary Fund: [www.imf.org](http://www.imf.org)

(LICUS);<sup>27</sup> and the United Nations Development Programme (UNDP) lists countries in its annual Human Development Reports according to a Human Development Index.<sup>28</sup> The number of undernourished people is estimated to be above 800 million (FAO, 2006), while the World Bank (2005) estimates the number of people living in the LICUS countries to be more than 400 million. The majority of people in either of these categories live in South Asia and sub-Saharan Africa. There are more details in Box 7.

In all the regions, wars and other disasters will very likely add new countries to the list in the future, while stable and good governance combined with economic growth may remove countries from the list.

### The effects of highly pathogenic avian influenza

Poverty is one major factor that will keep smallholder poultry production systems alive for some years. Greger (2006) may have identified another. In his analysis of HPAI H5N1 and its causes he concluded that:

*“To reduce the emergence of viruses like H5N1, humanity must shift toward raising poultry in smaller flocks, under less stressful, less crowded and more hygienic conditions, with outdoor access ...”*

The question is whether these views will influence the future policies of multilateral agencies, donor and recipient governments as they respond to HPAI. If they do, the actors described in the present paper possess valuable information about smallholder poultry production and the people that operate these systems.

#### BOX 7

##### Countries for smallholder poultry in human development

The following are among the countries – the list is not exhaustive – that for some time will have large proportions of poor people in their populations.

In Asia: Afghanistan, Bangladesh, Cambodia, the Democratic People’s Republic of Korea, India, Indonesia, the Lao Peoples Democratic Republic, Nepal, Pakistan, Philippines and Viet Nam.

In Africa: Benin, Burundi, the Central Africa Republic, Chad, Cameroon, Congo, Côte d’Ivoire, the Democratic Republic of the Congo, Eritrea, Ethiopia, Ghana, Guinea, Guinea-Bissau, Liberia, Madagascar, Malawi, Mali, Mauritania, Mozambique, Niger, Nigeria, Rwanda, Senegal, Sierra Leone, Somalia, Sudan, Togo, Uganda, the United Republic of Tanzania, Zambia and Zimbabwe.

In Latin America: there will not be many such countries, but Bolivia, Honduras and Nicaragua may need attention.

<sup>27</sup> List of countries can be found at the webpage of the World Bank: <http://www.worldbank.org/>

<sup>28</sup> <http://hdr.undp.org/>

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## ABBREVIATIONS

<b>ACIAR</b>	Australian Centre for International Agricultural Research
<b>AIDS</b>	acquired immunodeficiency syndrome
<b>ANRPD</b>	African Network for Rural Poultry Development
<b>AU-IBAR</b>	African Union Inter-African Bureau for Animal Resources
<b>BRAC</b>	Bangladesh Rural Advancement Committee
<b>CTA</b>	Technical Centre for Agricultural and Rural Cooperation
<b>DfID</b>	Department for International Development of the United Kingdom
<b>DLS</b>	Directorate of Livestock Services
<b>FAO</b>	Food and Agriculture Organization of the United Nations
<b>GMP</b>	good manufacturing practice
<b>HIPC</b>	heavily indebted poor countries
<b>HIV</b>	human immunodeficiency virus
<b>HPAI</b>	highly pathogenic avian influenza
<b>IAEA</b>	International Atomic Energy Agency
<b>IFAD</b>	International Fund for Agricultural Development
<b>IFPRI</b>	International Food Policy Research Institute
<b>IFS</b>	International Foundation for Science
<b>ILRI</b>	International Livestock Research Institute
<b>INFPD</b>	International Network for Family Poultry Development
<b>IRPC</b>	International Rural Poultry Centre
<b>LICUS</b>	low income countries under stress
<b>MDGs</b>	Millennium Development Goals
<b>NGO</b>	non-governmental organization
<b>OIE</b>	World Organisation for Animal Health
<b>PDAV</b>	Programme de Développement des Animaux Villageois

<b>PRSP</b>	Poverty Reduction Strategy Paper
<b>RVAU</b>	Royal Veterinary and Agriculture University
<b>SLDP</b>	Smallholder Livestock Development Project
<b>SPF</b>	specific pathogen free
<b>UN</b>	United Nations
<b>VSF</b>	Vétérinaires sans Frontières
<b>WPSA</b>	World's Poultry Science Association