

## **RESPONDING TO THE CHALLENGE OF BIRD FLU IN RURAL POULTRY - INSIGHTS FROM WEST BENGAL**

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Since 1997 when bird flu claimed its first human victims in Hong Kong and more particularly after the SAARS outbreak in 2003 and its widespread reappearance in 2004, this disease has not only gained enormous notoriety but has also generated intense debate and attention the world over on how it can be eradicated or at least prevented from causing a human pandemic. Countless papers and books continue to be written and published and numerous conferences of scientists and experts from relevant fields have taken place to devise strategies to thwart the spread and recurrence of bird flu. Millions of Dollars have been and continue to be spent in pursuance of this objective.

Despite large investments by international and national agencies and massive control efforts, outbreaks of bird flu unfortunately have not been contained. On to the contrary, they have been reported from new areas and new countries and notwithstanding the radical steps taken to eradicate bird flu or prevent its recurrence, outbreaks continue to sprout afresh. Though the disease is not ordinarily transmittable from poultry birds to human beings yet, in exceptional circumstances this has happened resulting in around 200 human deaths ascribable to bird flu. The details relating to human cases of bird flu infection suggest that intimate association and direct contact with the affected birds had facilitated this exceptional crossing of the virus from poultry birds to human beings. Even though in totality there have so far been very few cases of disease having moved from poultry birds to human beings with serious consequences, mercifully there is no case yet of the disease passing from human to human. And it is this possibility, which sends shivers down the spine of the human population.

The price that bird flu and the fear of bird flu are extracting is incalculable. Not only in terms of the cost of research and conferences but much more in terms of what it is doing to the livelihoods of the millions of people involved directly and indirectly with poultry the world over. Every time there is a report of an outbreak it generates alarm and worse an alarmist response. Media goes into dooms-day mode. Consumers, even thousands of kilometres away from an affected area get petrified about consuming any form of poultry. Chickens and eggs disappear from the menus of households, restaurants, hotels, airlines, canteens, railways and purchase charts of institutional buyers and government. Trade in poultry, not only in an affected area but also in surrounding areas is prohibited. The affected vicinity is cast away from the rest of the world as traditionally a leper would be.

In an attempt to arrest the disease, 'stamping out' is the standard response: hundreds and thousands of poultry birds are destroyed in the affected areas and several kilometres around it. Huge losses are caused and suffered. Livelihoods are irretrievably disrupted. And yet so often and sometimes soon enough there are fresh outbreaks in the vicinity or in another part of the same country.

Quite evidently, the classic stamping out strategy is not adequate in all situations and in all areas. And though stamping out would certainly be a part of the solution, it is obviously not the total solution. The reason of course is that the conduits to the reservoirs of the virus continue to be open and cannot be fully plugged. In such circumstances, it would be totally unrealistic to expect that poultry birds, whether confined in houses or in the open range, can be effectively protected against the virus through standard bio-security means; or that once an area is cleansed

it would remain cleansed for all times. There are far too many unmanageable vectors available to the virus for it to be physically or permanently barricaded.

Is it thus not time that we step back for a while from our intense involvement with current control methodologies to pause and reflect? To ask in a frank reappraisal whether in our undoubtedly honest anxiety to contain the threat of bird flu, we are not committing some fundamental conceptual errors, which are preventing an acceptably effective solution to evolve.

I am an engineer by education – and was a corporate management professional before I got involved with poultry as an entrepreneur. I am not a virologist, or an economist or a biotechnologist. I, therefore, totally lack the academic credentials to express an opinion on this issue. On the other hand I have spent virtually a life time spanning 40 years, on a full time basis, dealing with various facets of poultry-breeding, nutrition, husbandry, health and marketing. Of these, the first 24 years were exclusively in the area of industrial poultry and the last 16 years have been devoted to understanding rural poultry keeping in India and successfully establishing a commercially sustainable poultry programme for improving poultry production and economics in rural India. And since my work has necessarily always involved a substantial personal financial stake, the mistakes that I made were that much more painful and the rewards when they came, likewise, were that much more gratifying. These many years, wholly committed to poultry both industrial and rural, have enabled me to gain an understanding of the poultry scenarios of India and even more specifically of rural India. It has also provided meaningful insights not only relating to poultry but also the people involved with poultry. And it is thus that I venture to make some observations, which may be of some value in our battle to safeguard both the poultry producers and the human population against the threat of bird flu.

During my professional career I have confronted many challenges. Through these experiences I have arrived at some personal truths, which I believe would be relevant to share.

- The most appropriate solutions are situation / environment specific. There are hardly any effective ‘one size-fit all’ solutions.
- Even more than knowledge it is the mindset that influences the approach to any situation or challenge; and it is only through tuning the mindset to the realities of the situation / environment that the appropriate solution emerges.
- Very often, effective solutions lie beyond the boundaries of the conventional wisdom, processes or attitudes.
- Strategies as a rule, and more specifically relating to rural populations, must be largely in consonance with the skills knowledge, abilities and values of the target groups. If a strategy calls for adoption of practices, concepts, values people cannot in practical terms, understand or relate to or if it is in contradiction of their established values and customs it is unlikely to be effective.

And thus as we address the challenge of bird flu, we need to be clear about the distinct interest groups involved and the objectives that we seek to achieve. The stakeholders include:

1. Commercial / industrial poultry keepers, large and small, for whom poultry is the full time occupational activity. These groups keep poultry in confinement which is characterized by high bird density.
2. Village / rural poultry flock holders for whom poultry is an incidental, one of the many, activities and not a full time occupation.
3. Poultry ‘workforce’ both relating to confined poultry and rural poultry which has direct interface with poultry birds.

4. Consumers / human population at large, which has no direct contact with poultry and which could be affected only if bird flu becomes transmittable from humans to humans or remotely from consumption of uncooked meat / eggs of affected birds.

The international community is most concerned about the safety of the human population at large. To reduce the risk of a pandemic, it seeks to prevent any affliction of poultry handlers since they could be the primary vectors for spread of the disease to the rest of the human population. It also seeks to prevent meat and eggs from affected chickens to enter the food chain.

On the other hand it is the commercial and the industrial poultry producers large and small, who raise poultry in confinement as an occupational activity, who in fact are most immediately affected by outbreaks of bird flu. Firstly because of the huge losses they incur when birds die or have to be compulsorily culled. A tragedy further compounded when compensation is inadequate and delayed; and due to the fact that no compensation is paid for the period for which the farms are required to be kept empty, i.e. the loss of the business/occupation cycle. Most industrial / commercial poultry units that go through this havoc are crippled permanently and more often unable to recommence their poultry operations. Losses are also widespread and prolonged amongst those, whose business or trade relates to poultry or poultry products, even if not directly affected by the disease, because consumers shy away from poultry consumption for extended periods and the poor demand for eggs and meat and hugely depresses prices.

The position however, is different in case of village flocks, which exist in huge numbers and involve large sections of rural population in India and other parts of the World. The realities of poultry keeping and the attitudes of village households, who rear poultry vary from location to location within the same country and from country to country. My own understanding, based on my involvement with the Indian village poultry for the past 15 years and importantly supplemented by my extended visit to understand the responses in the Bird Flu affected areas of West Bengal in January 2008 is summarised below. Salient observations are:

- People that keep poultry in the villages as a rule are financially among the poorest.
- Poultry birds, overwhelmingly were non-descript and a mix of many genetic streams. They were not of any specific breed. The proportion of Rhode Island Red or improved birds was insignificant.
- Village poultry is subjected to outbreaks of mortality from time to time, which the owners consider as an integral feature of rural poultry raising.
- The mortality pattern in the case of recent outbreaks of bird flu was not dramatically different although the clinical signs were distinctly different.
- Mortality was localised and the disease progressed at a relatively much slower pace than in industrial settings. Mortality continued over an extended period of time but nowhere was the entire village poultry or household population wiped out. In fact far more birds survived than perished.
- Mortality not being an uncommon phenomena does not deter or discourage village poultry keepers from persisting with the virtually 'no cost self re-generating' model of poultry production, which is the hallmark of traditional poultry keeping in the villages of the Indian subcontinent.
- It is not an uncommon practice, at least in the areas visited in West Bengal, that when a bird looks sick and appears as it may not survive or if it has just succumbed it is cleaned up, cooked and consumed as food. Thus, sick birds and immediate mortality at worst often become food for village households; and since cooking is done at high temperatures all viruses and bacteria are killed and nobody is worse off from eating such chickens. This

was also the response to the recent outbreaks in West Bengal in the affected villages. And for me, a special and critical piece of new learning.

- Since no human contracted bird flu, either due to contact with infected birds or through huge consumption of chickens occasioned by the outbreak - healthy, sick, dying or dead - nobody acquired any fright of the of the disease, and the disease was considered just another passing setback.
- Compensation for culled birds offered by the Government was too low to interest or attract the village poultry keepers and in many cases was not paid upfront. Culling was thus widely resisted and only partly achieved.
- The environment in which the chickens are reared in the village makes it impossible for culling to be effective without the total co-operation of the village producers.

The above possibly explains, why a ‘stamping out’ strategy, which seems to be adequate when dealing with industrial confined poultry and possibly small free-range farms in the Western World does not seem to have produced any sustained results in the rural settings of India or Bangladesh.

It is a fact that village flocks are more directly exposed to environmental infection through ducks, migratory birds, village trade, human traffic etc. and various other vectors between affected and non-affected areas. And what is more, relatively speaking, there is a great deal of physical contact between the birds and family members in the villages. Rural poultry therefore do provide the most favourable matrix for the spread of bird flu to human populations. Thus, an effective and meaningful strategy to prevent and control bird flu outbreaks in the rural sectors of developing countries becomes an imperative. The essential and overriding requirement, however, is to devise strategies that take into account the ground realities and diverse characteristics of each rural setting. A uniform ‘fit all’ strategy, no matter how scientifically appropriate, is not likely to work for all rural situations if it overlooks the environmental specifics.

There is also absolutely no doubt once there is a disease outbreak, irrespective of its origin and causes, the priority task is stamping out of the disease by culling all poultry – including ducks in the affected territory and surrounding areas. This is readily achievable in the case of confined and free-range poultry in developed countries. On the other hand this represents an exceedingly difficult challenge with regard to diffused rural poultry, when the people do not wish their flocks to be culled. One can however take heart from the fact that unlike in the case of confined poultry the virus load and the spread mechanism is much less efficient in rural environments where birds are not constantly in close proximity and as a rule keep good distance from each other. This reduces virus load and the risk of transmission that is present in high density confined poultry. Likewise, faeces, which are a major source of transmission of disease in a confinement house is a less dangerous source in the open range environment due to the drying effect of sun, wind and the soil. Also, since the environmental stress level of free roaming village birds is much less than in case of confined industrial poultry their ability to withstand disease challenges is likely to be better. Importantly the genetic make-up of village poultry birds because of their inherent bio-diversity gives them greater chance of resisting the disease than is available to high yielding industrial poultry stocks which are closely bred and have a much narrower genetic base.

Thus in ordinary circumstances the spread of disease in rural settings involving traditional rural flocks will be much slower and less damaging than in intensive, commercial systems. Conceptually therefore, if the affected villages and surrounding areas are cleansed within a short

time span there is a high chance of the disease being truly eradicated from the area. This is the desirable objective for which an effective strategy is necessary.

In the preceding paragraphs I have detailed some of the salient features of village poultry in West Bengal. The position in all likelihood is very much the same in Bangladesh, which is culturally, ethnically and environmentally very similar. Whatever the differences, there are critical commonalities in respect of all village poultry in India. Poultry keeping in villages is a women-centred activity. It provides financial and nutritional benefits for the women and their families. It is traditionally a no-cost self-regenerating activity. Mortality amongst birds does not overly disturb the women and is accepted as an incidental facet of poultry keeping. And most importantly poultry keeping is an integral part of the women's lives. Village women, therefore, will normally not only resist culling of their birds but will also not agree to not keeping poultry for 3 months. This is the biggest cultural, ethnic, mindset barrier that the 'stamping out and keep poultry free' strategy has to contend with. To convince them that bird flu, a poultry disease, may cause human deaths is not likely to succeed because this is beyond their comprehension and conventional wisdom. And thus, as with other potentially hazardous lifestyle issues, AIDS, STDs, smoking, early marriages etc., bird flu does not arouse such fears as will prevent people from taking their chances. So quite clearly, rural 'flock' cannot be frightened about keeping poultry, something which has happily been an integral part of their lives for countless generations. Any effort to 'educate' them in this matter would be in practical terms of an exercise in futility.

Can 'stamping out' be done in rural settings through an authoritarian approach or through use of force, legal measures, police, army, etc? Anyone who thinks so evidently has no experience or knowledge of the rural environment including the poultry environment. Try catching a free roaming chicken in the open which has roof tops and trees to perch upon, crannies and crops to hide within and ponds to fly across. Even more impossibly so where the culling personnel, in keeping with specified norms, are required to be dressed up like aliens in cumbersome 'moon walking' safety suits, and where, more often, hardly any of them has ever handled or chased or trapped or killed a chicken earlier.

When neither fear nor force works there is really only one alternative: **Inducement**. And effective inducement as a rule has only one yardstick 'make an offer that cannot be resisted'. The relevant question is what type of inducement is likely to work and what does not work.

As an illustrative case it would be meaningful to look into the January 2008 bird flu outbreaks in West Bengal, India's most populous state in terms of rural poultry. Important also because West Bengal is part of a democratically governed Asian country, in which people do not hesitate to express their views. Not the least because these outbreaks provided me an opportunity to spend time in various affected areas in an effort to gain a first hand knowledge of what happened; how the authorities and the affected populace responded, and what appeared to be the realities on the ground.

First a brief outline of the outbreaks: Evidently the bird flu outbreak started around 20 December 20 was in the Moregram area, which is a small town encapsulated in a huge cluster of villages where poultry are reared extensively by the majority of households. The Moregram cluster, according to the local poultry dealers and persons involved, had a population of 30,000 or somewhat more chickens (apart from ducks). Un-abating mortality was finally – perchance – reported to the Government veterinary authorities about 7/8 January 2008. It was first diagnosed as virulent Newcastle disease. The clinical signs, however, were grossly different. Eventually, after various delays, the disease was officially diagnosed as HPAI - bird flu - on 17 January.

Culling in Moregram and in a radius area of 5 km around was ordered. A compensation package of Rs. 40 per adult village bird and commensurately lower prices for younger birds was notified. And the same for ducks. According to local sources, substantial mortality continued but it was not as if the entire population of poultry was decimated. According to these sources, about 6,000 birds died due to the disease during a period of 25 to 27 days. Moregram is also a major centre for trading of village poultry birds and all through the period 20 December to 16/17 January, live village birds moved out of this town to various destinations as was regular practice. Coming on the heels of the official announcement of the Bird Flu outbreak in Moregram, disease was notified in the village Sodhpur, some 70 km away. Sodhpur has, according to its inhabitants, about 300 households and had a poultry population of around 5,000 birds. Here too, birds died extensively but again the population was not decimated. The disease came into focus only because by then the Moregram outbreak had put the authorities on alert for any unusual poultry mortality. Culling was ordered in the area. Thereafter, over the next 10 days or so, there were reports and confirmation of bird flu in individual and odd poultry flocks from various locations in various parts of West Bengal (covering some of 10 to 11 Districts) far removed from each other and by some hundreds of kilometres from Moregram, suggesting strongly that these fresh outbreaks were possibly much a result of heightened vigilance by Animal Health Authorities. And furthermore, most of these outbreaks appeared to be unrelated.

Culling orders included village type birds, ducks and the confined and industrial type poultry in notified areas. From an original culling target of some 200 thousand poultry birds, the authorities claimed that they culled some 4 million birds including village birds, ducks and industrial chicken over a period of about 6 weeks. It was by all accounts a mammoth exercise involving a huge effort and large costs in terms of compensation and attendant administrative and operational tasks.

Claims apart, the reality is that the culling exercise was only partially successful – and in effect did not achieve the objective of cleansing the affected countryside of its rural poultry. And it does not take much imagination to understand why. The ‘compensation’ offered was ludicrously unattractive, especially when even this amount was not paid upfront in many cases. Firstly, a villager would have to get much more than Rs. 40 for an adult bird under normal circumstances. Secondly, at that price it made more sense for the family to eat the chicken than to give it away. And finally, if they could successfully hide the chickens or smuggle them out from the ‘culling-affected’ area, they would be able to save the birds for a better day. Actually, what happened when inadequate compensation was offered, and in many cases on even this on a deferred basis, was that villagers resisted culling, hid their chickens, ate as many as they could and smuggled their birds from affected to non-affected areas. Sadly, the environment ended up actually worse, with the virus having possibly been introduced into ‘clean’ areas.

That the West Bengal authorities went about the task of containing the bird flu outbreak in all earnestness and sincerity is beyond doubt. Rarely has a State Government responded with such alacrity and energy to a challenge of this nature. It is doubtful if any other State Government in India would have done better. The shortcoming was neither the interest nor the effort. It was more fundamental and not unique to West Bengal: rural poultry has never been part of any Government’s economic or social agenda and is thus of no real interest. Even the various State Veterinary Departments are primarily involved with dairy programmes and have no interest in rural poultry. Consequently there was no understanding of the levers that activate rural poultry keepers and no preparedness to cope with such a possibility. The only example to go by was the earlier Nawapur outbreak relating to confined industrial poultry in 2006 and its marginal fall out on a small sparsely populated rural pocket. And this was of no relevance to the West Bengal rural scenario.

The principal error was fixing the ‘compensation’ at a totally unattractive level. Had the compensation not been seen as confiscatory but as an inducement, I have little doubt that the Moregram outbreak and the vicinity would have been cleansed of all chickens and ducks in less than a week. In fact, poultry from adjoining areas would have been sucked into the vortex instead of the other way around. In order not to burden the main text of this note with too many figures, an Appendix with relevant facts about West Bengal, and some basic assumptions is referred to. Based on the assumptions detailed in the appendix, it appears that each notified outbreak in a poultry-dense area would ordinarily have involved culling of around 80,000 to 100,000 village poultry birds of all ages plus half as many ducks and the confined industrial poultry in the area as existed. And in non-dense poultry areas, around 20,000 to 24,000 village poultry birds plus half as many ducks and the industrial birds would have had to be culled.

Thus, the probable numbers of poultry birds required to be culled in all the affected areas, in all likelihood, need have been no more than 700,000 to 800,000 village poultry birds, 350,000 to 400,000 ducks, and a limited number of industrial boilers as were housed in the affected areas. And most importantly, the culling would have been effective as it would have received full co-operation from the village households. Just five steps would have been necessary:

- Fixing a truly attractive price well above normal market rates for the Rural Poultry birds, say at Rs. 100 for an adult village bird and adult ducks. Rs. 175 for an improved adult village bird and commensurate lower prices for growing birds of chicks and ducklings.
- Ensuring that the ‘compensation’ was paid in cash and on the spot.
- Adequate culling teams supported by experienced professional poultry butchers, ‘cutters’ as they are called. (TV visuals, which were thoroughly nauseating and crude showed that culling personnel lacked knowledge and experience in culling.)
- Each culling team equipped with minimal necessary protective clothing to prevent their alienation from the rural populace.
- All culling to be done at sunset when birds come home to roost, enabling the villagers to bring their birds in one go.
- Appropriate means of disposing of culled birds in a manner which is inoffensive and safe and prevents dogs and other animals to scavenge on culled birds.

And what might have been the cost even if 800,000 poultry birds, 400,000 ducks had been so paid for. A ballpark estimation involving poultry and ducks of different ages indicates that for a compensatory amount of around Rs.100 million (USD 2.5 million) complete cleansing of bird flu affected areas of West Bengal might well have been achieved within a span of a fortnight. An insignificant price for effectively stopping bird flu in its footsteps, preventing it from spreading to unaffected areas, and possibly from taking root in India.

Despite the massive effort and cost, in overall terms the culling remained ineffective. Birds were smuggled, hidden or just ‘traded off’ with culling teams. The ‘culled’ areas remained populated with free roaming chickens of all ages. And partial culling means in effect that the virus continues to survive in the area and will recur. And extraordinarily, ducks, which are the presumptive reservoirs of the bird flu virus, largely remained exempted from culling efforts. As it unfolded, neither the objective of completely cleansing the affected areas nor that of keeping the areas free of poultry for three months has been achieved.

And indeed even if a suitably high compensation had been paid, it would have been impossible to prevent the village households from introducing fresh poultry birds almost immediately. The only means of ensuring non re-habitation of poultry for 3 months could be through yet another

inducement. By paying each village household in the notified area a monthly inducement of, say, Rs. 400 per month for not keeping poultry, and to deny the entire village, the entire compensatory inducement amount if even a single household was found to be keeping poultry, thereby getting the villagers themselves to work as vigilantes. And what might this translate financially into? Approximately 80,000 households are prohibited from keeping poultry. At Rs. 400 per bird for 3 months it would mean an inducement of around Rs. 96 million (USD 2.4 million) or say around Rs. 100 million (USD 2.5 million).

Thus, if it were possible to revisit the West Bengal outbreaks as outlined above it would have involved a compensation of about Rs. 200 million (USD 5 million) to cleanse all the affected areas and 5 km radius around the epicentres and keep all these free of poultry and ducks for 3 months. The first outbreaks being notified mid-January, this strategy would probably have succeeded in completely sanitizing West Bengal with respect to HPAI - bird flu - by the end of May 2008. Of course there would have been additional administration and operational costs, which would be relatively small amounts in the context of the actual achievement. And what is more, it would have shown a way for other countries and areas when faced with a similar situation.

This concept represents an unorthodox approach, which has never been tried. But given the realities and context of rural poultry it is about the only one which is likely to provide results in an endeavour which in effect disrupts livelihoods and militates against the life values of the poultry keeping rural populace.

Whilst an attractive inducement for village households who rear no-cost/self-regenerating poultry and an appropriate compensation for industrial confined poultry should enable the establishment of a first line of defence, the channels of fresh infections from the external environment of migratory birds, ducks, waterfowl, pigs, and traffic of goods and people will continue to remain unobstructed. And, unless these can be reasonably fended against, the danger will continue to haunt the civil society and all poultry birds and poultry keepers and everyone associated with poultry.



## ANNEX: West Bengal – Data and Assumptions

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### Land Area

- Total land area: 88,752 sqkm
- Rural land area: 57,378 sqkm

### Human Demographics

- Total human population: 81.3 million
- Urban / Rural population: 30% /70% respectively
- Rural population: 58.9 million
- Rural population density: 1,027 persons/sqkm
- Rural households with an average of 6.5 persons per household: 9.1 million
- West Bengal is populated extensively, but density may vary. Assuming it varies in the range of 1:3, implies that population density may range from about 500 persons/sqkm to 1,500 persons /sqkm.
- Villages may commonly have between 150 and 300 households. With an average of 6.5 persons per household this implies that village populations will range from say 1,000 to 2,000 persons. Average: 1,500 persons /village.
- On the above basis, West Bengal may have 39,000 to 40,000 villages, i.e. 1 village per 1.45 sqkm.

### Poultry Populations

- The rural poultry population is estimated (Government census) at 31.5 to 33.0 million chicken and around 15.0 million ducks.
- Rural chicken density thus is 550 to 575 per sqkm while rural duck density is 275 per sqkm
- Not all areas keep poultry in the same density although all areas of West Bengal have poultry in some measure. Assuming a variation in density in the order of 4 to 6, it follows that the density may be as little as 225 birds per sqkm and 135 ducks per sqkm to as many as 1,000 birds/sqkm and 500 ducks/sqkm.
- Not all village households keep poultry/ducks. Generally, Muslims/handlers/Dalits and selected other groups keep poultry. If it is assumed that only 35% to 40% of village households keep poultry, 3.2 to 3.6 million households keep chicken.
- Thus, the average poultry population per household that keeps chicken and ducks is: approx 9 to 10 chicken and 4 to 5 ducks.
- Poultry population in an average village with say 225 households will be an estimated 2,000 to 2,500 poultry birds and 1,000 to 1,250 ducks.
- Estimated number of birds ordinarily required to be culled in case of an outbreak – in 5 km radius from the epicentre approx. 80 sqkm
  - High density poultry area: 80,000 - 100,000 chickens / 40,000 - 50,000 ducks.
  - Low density poultry area: 20,000 - 24,000 chickens / 10,000 - 12,000 ducks.
- Number of rural households affected by culling
  - High density area: 8,000-1,000
  - Low density area: 2,000-2,500
- In case of culling and procedures such as vaccination the average member of birds to be handled in a village will be 2,000 to 2,500 poultry birds of all ages and 1,000 to 1,250 ducks of all ages.