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Protecting Livestock – Improving Human Lives

A report on the CARI-GALVmed workshop on

Smallholder poultry production - opportunities and challenges

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Acknowledgements and Disclaimer

The Central Avian Research Institute (CARI) and Global Alliance for livestock Veterinary medicines (GALVmed) Workshop on 'Small holder poultry production - Challenges and opportunities' was held in New Delhi on 2 December 2016. The workshop was organized and facilitated by Dr Mamta Dhawan (GALVmed) and Dr JM Kataria (CARI). The organizers of the workshop would like to acknowledge the support provided by Dr VK Saxena for assistance in the pre workshop arrangements.

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List of Acronyms

AHDs	Animal Husbandry Departments
AI	Avian Influenza
ASCI	Agriculture Skill Council of India
BMPCS	Bhodal Milk Producers Cooperative Society
BRAC	Bangladesh Rural Advancement Committee
BYP	Backyard Poultry
CAHWs	Community Animal Health Workers
CARI	Central Avian Research Institute
CBOs	Community Based Organizations
CBPL	Central Biological Production Laboratory
CSR	Corporate Social Responsibility
DADF	Department of Animal Husbandry Dairying & Fisheries
DANIDA	The Danish International Development Agency
DDG	Deputy Director General
DLS	Department of Livestock Services
DOC	Day Old Chick
GALVmed	Global Alliance for Livestock Veterinary Medicines
GoO	Government of Odisha
GoCh	Government of Chhattisgarh
IBD	Infectious Bursal Disease
ICAR	Indian Council of Agricultural Research
ICMR	Indian Council of Medical Research
IVRI	Indian Veterinary Research Institute
JD	Joint Director
JSLPS	Jharkhand State Livelihood Promotion Society
KVK's	Krishi Vigyan Kendra
MIS	Management Information System
ND	Newcastle Disease
NDV	Newcastle Disease Vaccine
NGOs	Non-governmental Organizations
NIVEDI	National Institute of Veterinary Epidemiology and Diseases Informatics
NRLM	National Rural Livelihood Mission
NSPDT	National Smallholder Poultry Development Trust
PDR	Directorate of Poultry Research
PWD	Public Works Department
QMS	Quality Management System
SGSY	Swarnajayanti Grameen Swarojgar Yojana
SHG's	Self Help Groups
SHP	Small holder Poultry
ST/SC	Schedule Cast and Schedule Tribe
UP	Uttar Pradesh
VCI	Veterinary Council of India

1. Background

1.1 About the workshop

GALVmed is a product development and adoption partnership organization that intends to make a real difference to the livelihoods of resource-poor livestock keepers by facilitating provision of animal health tools within a sustainable economic framework. To be able to deliver livestock health products and services to smallholder poultry farmers in India, it is imperative to understand the context in which this sector operates, the challenges it faces and role of research organizations like Central Avian Research Institute (CARI) in promoting the smallholder poultry sector.

1.2 Objectives of the workshop

The Goal of the workshop was to increase mutual understanding and appreciation of challenges and opportunities in smallholder poultry production especially related to effective delivery of livestock health products and services in India and to jointly identify best practice and share experiences that are beneficial to individuals/state in order to improve delivery of livestock health product and services for increasing productivity.

Objectives of the workshop were:

i) To showcase smallholder poultry as viable a livelihood option
ii) To review major health Issues and policies in small holder poultry (SHP)
iii) To deliberate upon prophylaxis and vaccination regime suitable for SHP

Expected outcomes:

i) Increased awareness of small holder poultry as livelihood and food security option
ii) Clarity on major health issues and ways to combat them especially Newcastle disease
iii) Recommendations for appropriate health policy supporting small holder poultry

1.3 Selection of Participants

A wide range of stakeholders that include policy makers, practitioners, scientific fraternity, private day old chick producers, vaccine manufacturers and civil society were selected to participate in the workshop. Although they all play important role in the sector, they do not necessarily get a chance to come together on a common platform. It was deemed important to bring them together where issues related to health and productivity could be discussed exclusively. Thereafter attention of decision makers be drawn towards improving access to vaccines and medicines given the contribution this sector makes in livelihoods and protein security of small and marginalized farmers especially women.

There were 28 participants in all comprising Public sector (11), Private sector (5), civil society (4), Independent practitioners (2), and scientists (6). Facilitation was done by GALVmed staff with assistance from CARI participants.

2. Inaugural Session

Dr Mamta Dhawan welcomed all participants, took them through the objectives of the workshop and set down the ground rules for the WS. She then invited Dr H Rahman, DDG, ICAR to address the gathering.

Dr Rahman began by appreciating the initiative taken by CARI and GALVmed. He said that poultry is the fastest growing sector within agriculture and as per Survey of 2012, India has 720million poultry birds and produces 78 Billion eggs annually. However in spite of these impressive numbers, average per capita annual consumption of chicken meat in India is only 2.5 kg compared to 12.5 kg of the world. Although animal source protein also comes from milk, chicken is especially important in the north eastern states of India and tribal areas of Jharkhand, Odisha and Chhattisgarh where milk is not a part of their traditional diet. He mentioned that avian influenza has been the most devastating disease that has impacted poultry production adversely in the last decade.

He appreciated the work done by CARI in releasing region specific varieties of low input technology birds for the backyard sector. He mentioned that in the last 5 year plan, only research projects with clear outcomes and defined social impact would get funded. Moreover emphasis of ICAR would now be on the implementation of the technology developed and for that public private civil society need to collaborate. He wished success to the workshop and hoped that recommendations from this would help them improve research as well as implementation further.

Dr JM Kataria Director CARI thanked Dr Rahman for his positive views on the small holder poultry production and his observation that this sector is important given the increasing demand for animal source protein both in urban and rural populations. He then proceeded to set the mood of the workshop through his presentation about the poultry sector and the development this sector has made in the past 5 decades. This is especially true for commercial poultry sector as the growth over the years has been exemplary. Dr Kataria mentioned that there is scope for co-existence of commercial, semi commercial and smallholder systems given the diverse agro climatic zones and economic status of the people residing in the rural areas. He said that apart from providing protein security to poor households, it is also an important source of livelihood for them. Various models of village poultry production have been tried out historically by agencies like Danida, BRAC etc. and it has been shown that if diseases like Newcastle disease are controlled, livelihoods from poultry improve significantly.

3. Smallholder poultry production and management (session 2)

This session was presided over by Dr Gopal Tripathy AHD GoO. He invited Dr V K Saxena, Principal Scientist CARI to talk on- 'Augmenting small holder production-Indigenous chicken and their crosses'. Dr Saxena mentioned that natural resources i.e. water, land and food are getting scarce since both human and animal population needs them. In this scenario small holder production by masses makes sense since it is the best way to utilize resources without having negative impact on the environment. He went on to explain how investment in this sector would increase livelihoods of resource poor farmers who are either landless or marginal. There is ample scope for both Desi birds and improved birds to be reared and took the audience through various indigenous breeds and improved birds developed by CARI as well as other private agencies like Keggfarms, Yashwant Hatcheries etc. In order to supply improved birds without having a long supply chain, mini hatcheries in rural areas could be developed. The main constraints faced by poultry farmers was lack of knowledge about good practices in poultry farming, absence of poultry health cover and steady supply of quality chicks.

Dr Chandrahas Principal Scientist presented CARI's contribution through 'Family Poultry Production CARI Initiatives and Experiences'. Using native germplasm from indigenous breeds Aseel, Kadaknath, low input technology birds CARI Nirbheek, CARI Shyama, UPCARI, HITCARI were developed which have been

accepted by villagers as their performance in village conditions has been very good. He said that CARI through its improved birds is trying to ensure nutritional security based on ICMR recommendations regarding minimum consumption of eggs and chicken per person per day. The improved birds gave 180 - 200 eggs which could provide nutrition to growing children and once the egg laying stopped, the hen could also be consumed by the family. These birds can provide a good source of income if reared scientifically.

The following key issues were discussed after the presentations:

- Although the improved birds lay a good number of eggs, ideally the birds should have the broodiness character with the capacity to hatch chicks. The birds with broodiness are preferred by small holder farmers since they do not need external inputs in way of DOC.
- Improved birds are being given as a package through government schemes. But until their health needs, nutritional needs, safety from predators etc. is not looked into, it will not be a successful venture.
- India has excellent poultry germplasm and CARI should look at ways to conserve this. It is also important to maintain local biodiversity by not diluting the gene pool through addition of improved birds.

Dr Gopal Tripathy summarized the session stating that CARI had developed different varieties of birds based on needs of the farmers and different agro climatic conditions in the country. CARI is not only doing research activities but is also taking care that indigenous germ plasm is not diluted. He mentioned that all three presentations raised the issue of lack of health care of the birds and fragmented vaccine supply chain in the smallholder poultry sector. He opined that linking farmers to markets would be a crucial step in making SHP a viable livelihood option. Dr Kataria informed all that parent line of Kadaknath, Aseel etc. are maintained as CARI is very aware of their importance.

4. Preventive health care in smallholder poultry sector (session 3)

This session was dedicated to discuss various health issues pertaining to small holder poultry. There is a need to focus on SHP health issues specifically as commercial poultry is more organized and their health issues are taken care of in a systematic manner. SHP suffers immensely from preventable diseases and no systems are in place to tackle this issue.

Dr Kornel Das has a rich experience having worked with multiple organizations namely government of Odisha, DANIDA, FAO, GoI and GALVmed and he presented his views through PowerPoint presentation ‘Disease control experiences from NGO initiatives’. He mentioned that for resource poor farmers getting preventive health care was possible through trained community animal health workers as their needs are very basic and vets/para-vets would not find it cost effective to provide those services. He went on to mention in detail how community animal health workers (CAHWs) can be selected, trained and put into a system where they can sustain themselves by providing preventive health care i.e. basic vaccinations for ND and Fowl pox, deworming and first aid along with information on good husbandry practices. However, in spite of documented CAHWs case studies/models, they still remain out of the

legal framework. Government of Odisha has included CAHWs as service providers in poultry policy of Odisha which is acknowledgement of their role and something other states could emulate.

Dr Virendra Pillai (AHD Chhattisgarh) presented 'Sharing Chhattisgarh experience of ND control' a state led initiative to control ND in village flocks. He mentioned that 35% of all poultry in Chhattisgarh is under backyard system and is concentrated in areas that are inhabited by Tribal people. The biggest challenge for these birds is the outbreaks of ND and high mortality (90%) resulting from it depending on the strain of the virus. The state has been using F Strain, R2B and LaSota vaccines to control ND that require cold chain. At times, vaccination failures have been reported which are attributed to break in the cold chain because of power cuts. He thanked GALVmed for supporting the development of the LaSota thermo-tolerant ND vaccine and bringing it to Jharkhand through HESTER Biosciences Limited partnership. He mentioned that once this vaccine is adopted, cold chain issues at the last mile would be largely surmounted. The state AHD has included ND vaccinations in the list of vaccinations it has for all livestock and poultry since 2001. 16 million doses of ND vaccine were used up in 2014-15 and GoCh is very committed to control ND especially in SHP since its inception in 2000.

Dr Pillai mentioned that the results of DANIDA project (2004) promoting BYP and control of ND were astounding and the process of training CAHWs for ND control in the project has been replicated in the entire state. Presently AHD GoCh are training AI workers/ *Go sevaks*[1] to vaccinate birds and are also training CAHWs from within the community. Farmers are made aware of ND through wall paintings, talks in SHG meetings, showing documentary movie on BYP keeping etc. Convergence of government schemes is being done so that farmers not only get DOC from the AHD, but also funds from PWD department to build shelters under supervision of AHD, training from KVKs etc. AHD is currently trying to get budget for poultry vaccinations from RKVY (Rashtriya Krishi Vikas Yojana)[2]. Challenges included sustaining and retaining CAHWs, lack of awareness amongst farmers and non-availability of calendar for vaccinating birds as per local conditions since each state is different.

The third presentation in this session was on 'Efficacy of LaSota vaccine in BYP – A Study report' presented by Dr Sulochana Shrestha. The report is published in an international journal: 'Tropical Animal Health and Production' and can be accessed at the link below[3]. Since there is no standard vaccination regime for SHP, ND vaccination schedule for commercial poultry is followed which is neither practical nor feasible given the multi age flock in villages and no 'all in all out' [4]system in place. Usually after priming with LaSota intraocular vaccination, birds are given R2B intramuscular vaccination. This at times

[1] Trained to provide Artificial insemination to cattle

[2] National Agriculture Development Scheme is a state scheme for eleventh five year plan. This scheme is mainly focused on the increase yield in the agriculture and its allied sectors.

[3] http://link.springer.com/article/10.1007/s11250-016-1205-4

[4] 'all in all out' – In commercial poultry farms, stock of 'Day old Chicks' is bought at the same time and once they attain the required weight, the entire lot is sold on the same time. Since all birds are of the same age and are reared at the same place, vaccinating them is easier compared to village chicken that are of different age and reared in different households.

causes lameness in birds and is not preferred by farmers. Moreover it is difficult to keep track of birds that have had LaSota or R2B in village conditions. Therefore intraocular vaccination with LaSota every quarter to all poultry birds is logistically more feasible and practical. The village chickens in the study were from GALVmed's ND control project (2011-12) in Jhapa (Nepal) bordering Siliguri District of W Bengal. Therefore it is safe to assume that results would be similar for chicken in Indian context.

There are few data available on the different circulating ND strains in Nepal, and as antigenic variation is detectable between ND strains, it is important to identify the optimum strain for use in local vaccination programmes. There are no data available on the efficacy of modified live ND vaccines in Nepal village chickens. The present study compares the efficacy of a LaSota strain with LaSota and R2B (Mukteshwar) strain booster vaccination under laboratory conditions against challenge with a virulent Nepalese field strain. The study also reports the Newcastle Disease titres of village chickens after repeated field vaccination with LaSota strain. The titres were tested by Haem agglutination Inhibition test and Enzyme Linked Immunosorbent Assay.

The study showed that all village chickens vaccinated with a NDV LaSota live vaccine developed protective levels of HI antibodies and were completely protected when cha llenged with a virulent local field strain. Local village poultry keepers were happy with the vaccination results and productivity was improved in terms of increased flock size when LaSota vaccines were administered at three monthly intervals. The study proves that the immunity conferred by the LaSota vaccine is sufficient to keep village poultry safe from NDV. Furthermore, the LaSota vaccine is suitable for routine vaccination of village chickens in Nepal and improving the socio-economic wellbeing of poor rural poultry keepers.

Dr Kataria presented 'Small holder poultry health issues' where he appreciated Dr Kornel Das's presentation especially issues raised by him about poultry health problems. He highlighted the poor biosecurity measures adopted by small holder poultry keepers that at times led to spread of diseases incurring heavy losses. Inadequate good husbandry practices were also a major constraint resulting in below par productivity. Simple practices of washing hands after handling birds, not mixing new birds with the older flocks, making bamboo fence enclosure for birds etc. can go a long way in keeping diseases away. Although ND is a major problem, predation is also an issue in villages. All ND vaccines available are very efficacious when used properly as well as transported and stored under adequate cold chain. Therefore, thermo-tolerant ND vaccine is especially useful in Indian conditions where temperatures touch 45-50 degrees Celsius and power cuts are rampant. There is also a need to monitor if birds are sero-converting post vaccination.

He emphasized the importance for poultry farmers to be able to differentially diagnose ND from other diseases like AI since a lot of symptoms are similar. Thin shelled eggs, cyanotic comb, wattles and legs are clear markers for AI and the poultry farmers need to be aware of this especially in the areas where flocks have been vaccinated for ND. Immediately AHD should be informed and disposal of dead birds should be done following correct procedures of deep burial or cremation.

Points discussed post presentations:

- Dr Grewal wanted to know if all 8 birds in contact control group in the study of ND to which Dr Sulochana replied that they had died not because of ND only but also because of other diseases. Moreover, in the control group, horizontal spread of immunity was also quite noticeable.
- Awareness and adoption of good husbandry practices like provision of clean drinking water, cleaning hands properly after handling birds, not keeping birds in own dwelling would increase productivity and reduce spread of disease. Deworming and Vitamin C can help to boost the immunity.
- Referring to Chhattisgarh presentation discussion was held at the modus operandi of ND vaccinations and systems in place for reporting ND outbreaks so that other states could also replicate the model.
- National Institute of Veterinary Epidemiology and Disease Informatics (**NIVEDI**) in Bangalore is working on all disease. Dr Pillai informed that they do not allocate any budget for vaccinations unless the disease is reported by the state AHD and is confirmed by higher authorities. Usually ND outbreaks are not reported officially in most states so they do not get budgets and that leads to no dedicated programme for ND control!
- Hester has developed a thermo- tolerant LaSota vaccine which seems to be a good vaccine but there is need to follow a standardized vaccination schedule
- Next focus should be on control of IBD especially in semi commercial flocks.

Dr Nitya Ghotge CEO Anthra, summarized the session appreciating availability of thermo-tolerant ND LaSota vaccine as it would go a long way in meeting cold chain challenges in remote rural areas. She opined that now many companies are producing equipment that run on solar energy and collaborations with them for solar energy driven refrigerators could solve electricity issues that impede cold chain maintenance so vital for vaccines to remain effective. She regretted that focus of state governments is still on large poultry farms while SHP health issues are being ignored. Although institutions like NIVEDI are there, documentation of village epidemics at gram panchayat level is the need of the hour.

5. For future policies (session 4)

Two presentations were made in this session chaired by Dr JM Kataria and co-chaired by Dr AB Mandal. In order to deliberate on the way forward, it is imperative to review new models that are innovative and meet the demands of the people. Learnings from these can inform policy makers when formulating future policies.

'Innovative veterinary service delivery model for small holder farmers' was presented by Dr Rahul Srivastava, Marketing Officer-South Asia, GALVmed. This model showcased a partnership between a private sector company and NGOs where vaccine and other veterinary products are manufactured by a private company in rural areas of Chhattisgarh, Odisha and Jharkhand. It is a 'for-profit' model where all

stakeholders in the chain are expected to make an income so that the system sustains itself over the coming years. One of the common constraints in increasing productivity is lack of availability of vaccines and veterinary health products in remote areas. This model addresses this constraint by making available products at block level through established medicine retail shops on one hand and training CAHWs to provide services to farmers on the other hand. Other local NGOs, institutions like PRADAN and Pathe Pathshala in Odisha, Jharkhand State Livelihood Promotional Society (JSLPS), Birsa Yuva Sewa Samiti (BYSS) in Jharkhand etc. have collaborated and are part of this initiative. He concluded that all stakeholders need to work together to create a sustainable supply chain to serve and make SHP sector a success.

Dr Manoj Shukla shared his experience in the sector and welcomed the GALVmed-Hester initiative in Chhattisgarh. His opinion was that SHP needs to be vaccinated as it could have adverse impact on commercial poultry. He mentioned that commercial farmers have been vaccinating BYP in the villages around their poultry farms and have been advocating ND vaccination through meetings with village heads.

Dr Praveen Kumar Singh of Jharkhand State livelihood promotion society presented 'Role of CAHWs and enabling policies in empowering women and improving livelihoods - JSLPS view point'. JSLPS was initiated by UNDP but is now flagship programme of NRLM, Sanjeevani, SGSY and other rural development schemes of the government. The work is done through SHGs formed in 24 districts, 124 Blocks! Partnership with GALVmed-Hester is for provision of technical support in the field in training women Aajeevika pashu Sakhis (CAHWs). This would create a platform to converge with AHD for access to medicines and advocacy for mainstreaming these pashu sakhis. Initially target was to reach 100000 farmers in 3 years but the partnership with GALVmed-Hester ensured that this was reached within 10 months of the partnership. Apart from preventive health care and basic first aid services these CAHWs are trained on production enhancement so that they can build capacities of farmers to rear their poultry and goats as a business. JSLPS has developed community insurance for its members so that they get compensated for mortality in their flocks.

The good news is that Jharkhand AHD has started training the CAHWs and has also agreed to get them registered with the local public vet for remote supervision. Moreover they have come up with a plan for next year to promote smallholder poultry in newer areas through training more CAHWs.

The biggest challenge to their model is free distribution of vaccines by government as it is difficult to charge for vaccinations in one area while people in adjoining areas are getting vaccinations free of cost. The model of using CAHWs to vaccinate and provide basic services to goats and poultry on payment basis has been appreciated at various forums but has not been able to convince VCI for reviewing its policy towards CAHWs.

Mr Asit Mohan presented the 'Community Small Holder Poultry model' an initiative of National Smallholder poultry development trust. NSPDT, through its small holder community model, enables poor women in rural India to start and run successful poultry enterprises. Women from ST/SC families

are promoted as poultry producers in contiguous villages, they are organized in collective of 500-1,000 producers, which is registered as cooperative society. Cooperative provides all the raw materials like chicks, feed, medicine, vaccines etc. and members are not required to pay upfront. It also provides technical services to members and organizes for round the clock para-vet service at village. It is managed by a team of experienced professional staff from Management and Veterinary background supported by customized MIS software and Quality Management System (QMS).

Thanks to this model, there is 75-100 % increase in annual income, and households become net surplus and typically start investing in land, education, health etc. Moreover there is significant drop in distress migration, helps women stay back in the villages as they have means of livelihood. This in turn helps to reinstate family wellbeing and social life – particularly children and their education.

Discussions

- Queries were raised about origin of the NSPDT trust, broiler breed being raised and sourcing of the DOC. Asit Mohan explained that it was initially started by 100 people from PRADAN and later on formed as a cooperative society by few women in the group. The breed used is Vencob and 40 % of the DOC requirement is fulfilled by their own hatchery and balance 60 % is picked up from the market. However this was more of a model where small holders raising broilers were integrated by a company/institution and not possible to replicate until some company took charge of providing forward and backward linkages.

- Anisha Singh of Keggfarms informed that Keggfarms is a social enterprise which works for profit but where profit is not the only motive. Social impact is given an equal priority. Although it is head quartered in Haryana it has 7 hatcheries that produce 2.5 crores broiler chicks in a year that cater to states like Bihar, Odisha, UP and W Bengal etc.

Dr Qidwai was invited by Dr JM Kataria to share his views on SHP in the state of Uttar Pradesh given his experiences in the sector. He said that UP is lagging behind in poultry sector but in past 6-7 years steps have been taken by state government and supported by central government that has led to improvement in the poultry sector. In past 2-3 years poultry production has gained momentum in UP with significant increase in egg production. Small holder poultry was given attention first as the market was flooded with indigenous looking chicks being sold whose source was unknown. Since these chicks had multiple health problems and almost 40-60% died it was decided to come up with government poultry farms that could supply quality low input technology birds as market was ripe to buy them. Presently 2000000 DOC are being distributed annually through NRLM scheme of government. Although the beneficiaries got a package with DOC, feed etc, their health needs were not factored in the package. ND is the most important diseases to be addressed as 40% of the mortality in birds can be prevented by controlling only ND.

The birds that died were disposed unscientifically and that too became an issue. Now situation is such that a Poultry Policy has been made in 2013 with the target to produce 1 Cr eggs/per day through Layer farms. People have been incentivized with 70% subsidy from government to build these farms and slowly commercial poultry farming is also picking up in the state.

5. Group work (session 5)

The knowledge shared through various presentations gave good grounds to brainstorm on the major issues and ways to surmount them. Groups were organized thus: groups 1 and 2 worked on SHP health issues while Group 3 and 4 looked at ways to enhance productivity. The groups were asked to nominate a chairperson and a presenter at the beginning and were allocated an 40 minutes for deliberations and 10 minutes each to present their findings.

5.1 Group 1 and 2 (see Annexure)

Prioritize 3 major diseases, constraints in controlling it and way forward i.e. recommended vaccinations regime, policy changes needed etc.

Expected output: *Through a presentation clearly present the road map to address the prioritized diseases. State the practical steps that should be taken to address the issue. Who would be responsible for what action and how? What should the immediate next steps be?*

i) Group presentation

Both groups agreed that ND and Fowl pox were major diseases afflicting BYP while incidence of IBD and Coccidiosis was also noted. They agreed that although poultry keepers knew the symptoms of ND, most were not aware about ND vaccination as a preventive measure. Adoption of vaccination also increased once they see vaccinating birds surviving an ND outbreak while non vaccinated birds died. It was also agreed that there is very little being done by public agencies to build their capacities.

Another constraint is weak surveillance and lack of scientific diagnosis since diagnostic facilities are not always available or accessible. So most of the ND outbreaks recorded are based on symptoms and are anecdotal. This also leads to under reporting a problem which means lesser attention being paid to it.

Last but not the least is lack of vaccines in appropriate vial sizes and people to deliver it at the door step of poultry farmers. Vaccinations are still a public function but SHP does not figure very high on the AHD priority list. Moreover inadequate human resources are also a huge issue in reaching out to all.

ii) Way forward

- Deworming followed by ND vaccination should be done by trained CAHWs. However if CAHWs could get standardized training and be linked to AHD for oversight, it would be ideal. Most experiences shared by various presenters point towards this model as most suitable to the needs of the poultry keepers given human resources constraints of AHD.
- Post vaccination, sero-monitoring should also be carried out by AHD.

- Awareness creation amongst farmers on basic health practices like adoption of preventive health care, bio security measures and ethno veterinary practices needs to be provided by AHDs.
- Research to be conducted by CARI on inheriting traits that are considered important by poultry farmers like broodiness, disease resistance etc.
- Road map suggested for state AHDs:

2017

Develop thermotolerant vaccine in appropriate vial size

Train CAHWs/farmers on vaccination and husbandry practices

Ensure proper convergence amongst various public agencies

2020

Establish a viable supply chain of vaccines

Affordable vaccines available as and when required

Diagnostic facilities more accessible

2023

Farmers are vaccinating their birds (80% coverage)

Income from poultry increases many fold!

2024

Vaccination regime

Diseases that are of concern are Newcastle disease, fowl pox and to some extent Infectious Bursal Disease (IBD, Gumboro). Although one group had come up with F vaccination on day 1 for ND, other groups questioned it as there is no way DOC would get vaccinated in village conditions as the eggs can hatch on different days in different households and it won't be feasible for a service provider to vaccinate just 10-20 chicks. It was agreed that giving LaSota intra ocular vaccine every 3 months is a better option. This would be a practical cost effective way to vaccinate multi age flocks in rural

conditions. CAHW can come to a village and vaccinate all birds in one day and visit that village again after 3 months. S/he might vaccinate young chicks if they hatch in the meantime but aim would be

to get maximum birds vaccinated at the same time. This is also a tried and tested method and needs to be adopted sooner than later.

It was mentioned that while Fowl-pox was second most important disease for SHP farmers, IBD is also becoming an issue. However, it more of a problem with flocks numbering more than 100 birds that are confined in sheds and is not strictly a problem of backyard birds.

Vaccination regime proposed

Disease	Vaccine	Vaccination regime
Newcastle disease	LaSota Vaccine	Chicks at 3 weeks of age Thereafter every 3 months, intraocular
Fowl Pox	Pigeon pox vaccine Fowl Pox Vaccine	At 7 days of age At 6-8 weeks of age and then annual vaccination
IBD*	IBD vaccine	At 14 days of age Repeat at 21 days of age

*IBD vaccination would not be required in flocks that are kept in free ranging backyard system

6.2 Group 3 and 4

Discuss ways to enhance productivity especially looking at:

i) Delivery of health services
ii) ii) Backward and forward linkages

Expected output: *Through a presentation clearly present what is available in form of health services and inputs (DOC, vaccines, feed etc.), role of public sector, role of private sector, any other out of box ideas. State the practical steps that should be taken to address the gaps. Who would be responsible for what action and how? What should the immediate next steps be?*

The groups deliberated upon various issues impeding optimal production in the small holder sector. They looked at the issues affecting supply of chicks, vaccine and feed and role government, private sector and NGOs had to play in each of them. Overarching all these was the need for full blown extension programme for farmers on both diseases as well as management issues including forward and backward linkages.

Organizations and expectations

Government	Civil Society	Private sector
Making pro poor policies that enabled development of infra structure for market linkages, chick supply, awareness creation and training of farmers and CAHWs.	Seen as an implementing agency with intellectual knowhow and vast outreach for community mobilization	Supplier of quality DOC on a regular basis in adequate numbers, establish supply chain for vaccines and veterinary medicines at a fair price and also supply poultry feed for small farms

7. Recommendations and concluding remarks

7.1 Low input technology birds with better enhanced genetic features like **resistance to diseases (especially ND) and with broodiness** traits should be developed by CARI.

7.2 There is dire need for an extension system to be set up by AHD so that farmers can be **made aware of basic biosecurity issues and preventive health care through mass media** like TV, radio etc.

7.3 The biggest cause of losses in smallholder poultry is Newcastle Disease. **Simple vaccination regime of intraocular LaSota ND vaccination every 3 months needs to be advocated by CARI /DADF for BYP** as commercial poultry vaccinations are different since they have all in all out flock system in place.

7.4 Outreach of public veterinary services and delivery of livestock health product to poor farm households in remote rural areas is grossly inadequate due to limited human resources. **Collaboration among all stakeholder including government, NGOs, private sector organizations in product and service delivery has to be reflected upon**.

7.5 NGOs / government programmes trained CAHWs are actively providing services to poultry and small ruminants in many places. However, there exist striking differences in what is permitted in law and what is practiced in field. **Pro poor policies are needed that ensure incentive for private sector participation in service / livestock health product delivery**.

7.6 Training of private actors (CAHWs) outside the government system need to be promoted and standardized. Agriculture skill council of India developed occupational standards for CAHWs which should to be adopted as ASCI has certification/accreditation system that can certify the CAHWs.

7.7 The commercial poultry sector can play an important role in disease control (by awareness creation and vaccination drive every 3 months, if commercially viable) in smallholder poultry segment in nearby villages/ area.

The workshop concluded with a Vote of Thanks by Mr Raj Gera on behalf of all participants where he thanked the organizers for bringing diverse stakeholders on one platform. He appreciated the constructive atmosphere of the workshop that led it to be highly interactive and beneficial to participants. Dr Kataria closed the workshop with the expectation that the knowledge and information shared would empower different stakeholder including policy makers in the various states represented at the workshop, to make necessary policies or reforms taking into account the interests of smallholder poultry farmers who are the focus of CARI and GALVmed's interventions.

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Annexure 1

Smallholder poultry – Challenges and Opportunities
CARI- GALVmed Joint workshop
Hotel Royal Plaza, New Delhi

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Annexure 2

Agenda

Objectives

1) To showcase smallholder poultry as viable a livelihood option
2) To review major health Issues and policies in small holder poultry (SHP)
3) To deliberate upon prophylaxis and vaccination regime suitable for SHP

Expected outcomes

1) Increased awareness of small holder poultry as livelihood and food security option
2) Clarity on major health issues and ways to combat them especially Newcastle disease
3) Recommendations for appropriate health policy supporting small holder poultry

Programme

Time	Topic	Presenter
9.00-9.20	Registration	Ms Sharmila
9.20- 9.40	Welcome, Introductions and Setting the scene	Dr M. Dhawan
9.40-10.00	Introduction of the Theme	Dr Kataria
10.00-10.20	Address by the Chief Guest	Dr H Rahman
Session 1	**Small holder poultry production and management**	
10.20-10.40	Augmenting small holder production-Indigenous chicken and their crosses	Dr V K Saxena
10.40-11.00	Family Poultry Production CARI Initiatives and Experiences	Dr Chandrahas
11.00-11.30	Tea and Group photo	Ms Sharmila
Session 2	**Preventive health care**	
11.30-11.50	Small holder poultry health issues	Dr Kataria
11.50-12.10	Disease control experiences from NGO initiatives	Dr Kornel Das
12.10-12.30	Sharing Chhattisgarh experience of ND control	Dr N. Pillai
12.30-12.50	Efficacy of Lasota vaccine in BYP – A Study report	Dr S. Shrestha
12.50-13.20	Discussions	
1.20-2.20	**Lunch**	
Session 3	**For Future Policies**	
2-20-2.40	Innovative veterinary service delivery model for small holder farmers	Dr R. Srivastava
2.40-3.00	Role of CAHWs and enabling policies in empowering women and improving livelihoods - JSLPS view point	Dr PK Singh
3.00-3.20	Community Small Holder Poultry model	Mr Asit Mohan
3.20-3.30	Discussion	
3.30--3.45	**Tea**	
3.45-5.00	Group work - SHP health issues, constraints and solutions	Dr Mamta Dhawan
5.00-5.20	Recommendations and concluding remarks	CARI, GALVmed
5.20-5.30	Vote of Thanks	Mr Raj Gera

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Annexure 3

Group work

Group 1	Group 2
Dr Prabhat Kumar Pandey	Dr Praveen Singh
Dr Nitya Ghotge	Dr Gopal Tripathy
Dr Ajay	Dr Rahul
Dr VK Saxena	Dr Sulochana
Mr Nilesh Desai	Dr VK Sachan
Mr Asit Mohan	Dr Mandal
Mr Raj Gera	

Group 3	Group 4
Mr Piyush Mishra	Dr Kornel Das
Maj KS Grewal	Ms Anisha Singh
Dr Qidwai	Dr AS Yadav
Mr Sanjay Bhagat	Dr Shukla
Dr Virendra Pillay	Dr Gautam Roy
Dr Jag Mohan	Mr Pranjit