Sustainable distribution of Newcastle Disease (ND) vaccine as a way to control ND and improve poor livestock keepers' livelihoods in India (Mayurbhanj)

FINAL EVALUATION

13th March 2013

Executive Summary

Most of the rural families in Odisha (India) earn their livelihood from agriculture related activities and livestock production is one of the major sources that supplements the income and nutrition of resource poor families. In Mayurbhanj, the district having the highest tribal[1] population in Odisha, backyard poultry (BYP) production plays a major role in livelihood of the rural families since it is not only a livelihood option but a necessity as they need poultry for different festivals and rituals associated with worship.

Newcastle disease (Ranikhet disease) is the most common preventable disease of poultry causing 60-70% mortality and significant financial losses. The backyard poultry keepers lack knowledge about the vaccines to combat it and also the vaccine is not available to them. To address this problem, a Pilot Project on control of Newcastle Disease was implemented by Bhodal Milk Producers Cooperative Society (BMPCS) and GALVmed in two blocks (Morada and Rasgovindpur) of Mayurbhanj district. The objective of the project was to establish a sustainable backyard poultry vaccination network through a cadre of Community Animal Health Workers (CAHWs) for delivery of services at the farmers' doorstep.

Taking a holistic training approach ensured that, along with ND vaccination, good practices in housing, feeding, and poultry keeping were introduced to make poultry production more profitable to farmers. The project interventions have ensured a steady income of around INR 3,000 for CAHWs, increase in protein intake by households and empowerment of women through increased participation in decision making within their households.

The project period lasted over a year and included 4 ND vaccination campaigns: The baseline study was conducted in May 2011 just before the first vaccination and the final evaluation was conducted on September 2012 after the 4th vaccination.

The results based on random questionnaires to 284 households showed:

1. The number of poultry per household increased from 19.70 to 30.18 at the end of the project period.

[1] A tribe is a unit of socio-political organization consisting of a number of families, clans, or other groups who share a common ancestry and culture and among whom leadership is typically neither formalized nor permanent

2. The monthly intake of meat and/or fish in the diet increased by an average of 1.52 times a month per household.

3. Weekly egg production increased by 2.80 eggs a week per household, and monthly poultry production per household increased by 1.51 fold (from 4.04 to 6.10 poultry produced per month per household)

4. The annual net poultry income increased on average by 9,069 INR (approx. USD 166 at the time of the report) per household after the project intervention.

5. During last one year there was no incidence of poultry loss due to Newcastle disease (ND) which shows the project has been successful.

BMPCS- GALVmed

Newcastle Disease Control Pilot Project

Mayurbhanj, Odisha (India)

Project Report (March 2011-November 2012)

1. Summary

Most of the rural families in Odisha earn their livelihood from agriculture related activities and livestock production is one of the major sources that supplements the income and nutrition of these resource poor families. In Mayurbhanj, the district having the highest tribal population in Odisha, backyard poultry (BYP) production plays a major role in livelihood of the rural families since it is not only a livelihood option but a necessity as they need poultry for different festivals and rituals associated with worship.

Newcastle disease (Ranikhet disease) is the most common preventable disease of poultry causing 60-70% mortality and significant financial losses. The backyard poultry keepers lack knowledge about the vaccines to combat it and also the vaccine is not available. The government veterinary department normally focuses on the large ruminants and the small stock especially the backyard poultry is ignored. There are occasional vaccination drives by the department but the outreach is limited. To address this problem, a Pilot Project on control of Newcastle Disease was implemented by Bhodal Milk Producers Cooperative Society (BMPCS) and GALVmed in two blocks (Morada and Rasgovindpur) of Mayurbhanj district. The objective of the project was to establish a sustainable backyard poultry vaccination network through a cadre of Community Animal Health Workers (CAHWs) for delivery of services at the farmers' doorstep. The project has been successful in developing trained community animal health workers (CAHWs) for delivering the vaccination service for small stock.

Taking an holistic approach ensured that along with ND vaccination, good practices in housing, feeding, and poultry keeping were introduced to make poultry production more profitable to farmers. The project interventions have ensured a steady income of around INR 3,000 for CAHWs, increase in protein intake by households, and empowerment of women through increased participation in decision making within their households. Apart from ND vaccination the CAHWs provide services like poultry de-worming, Fowl pox vaccination, Goat deworming, goat PPR vaccination and pig deworming.

2. Objective

The objective of the pilot project was to establish a sustainable network for poultry vaccination. The major activities undertaken by the pilot project were to make the poultry keepers aware of the benefits of vaccinating their poultry against NCD, ensure supply of quality vaccine from retailer to farmer and have trained vaccinators to give services on payment. The thrust of the project was to increase the access of the BYP keepers to vaccinate their poultry and shoats regularly and establish a system to do so. The assumption was that once benefits were realized, farmers would be willing to pay and private actors would be available to provide service.

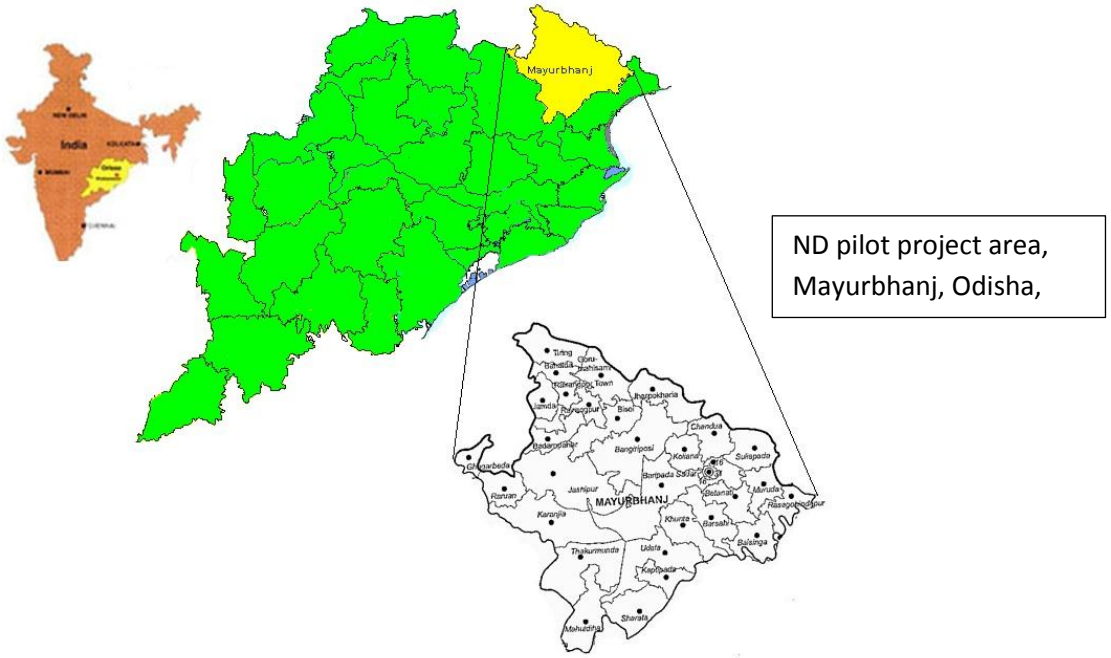
The project aimed at -

- Making wo/men farmers aware of advantages of vaccination to actively seek services for their small stock
- Strengthening of Vaccine supply chain to make available quality ND vaccines in appropriate pack size
- Establishment of Livestock Care Centre (LCC) and vaccine centres to stock quality vaccines under proper cold chain

- Door step delivery of sustainable paid services to the Farmers by trained CAHWs

3. ND pilot project area

The project area consists of 114 villages of Morada and Rasgovindpur block of Mayurbhanj district of which 92 were participated in the project. The north eastern side of the project field shares the border with West Bengal.



ND pilot project area, Mayurbhanj, Odisha,

The climate is hot and humid in most in the year except winter season. The majority of the project beneficiaries are Tribal belonging to "Santhal" community. The percentage of families living under BPL (Below poverty line) is nearly 73 % in the project area. In case of only tribal communities the BPL percentage goes beyond 80%. The average flock size of poultry per family is nearly 20. The objective of the pilot project was to establish a sustainable supply chain of quality poultry and livestock vaccine maintaining cold chain at all level and vaccination at doorstep by CAHW. To achieve this, project has developed a network between all the actors involved in livestock vaccination. For the supply to remain viable, each actor needs to make profit and since they are all making a supplementary income through this intervention, scope for sustainability is high.

4. Project Model

The pilot project model is shown through the flow diagram below;

Retailer ⇨ LCC ⇨ Vaccine centre ⇨ CAHW ⇨ Farmer

Availability of vaccines at the state capital (Bhubaneswar) was not a problem in Odisha as the distributor based their supplies vaccines to areas that have big commercial poultry farms. However, there were hardly any retail shops selling poultry vaccines at the district level to address the need of the BYP keepers on a regular basis. To establish regular supply of vaccines BMPCS identified a animal feed and veterinary medicine shop located at Baripada, district headquarter of Mayurbhanj and promoted it to stock poultry vaccines for BYP keepers. Presently the shop not only supplies vaccine to the project area but also to other agencies, farmers and even the Animal Husbandry department. The retailer has also started stocking other vaccines like Fowl pox etc.

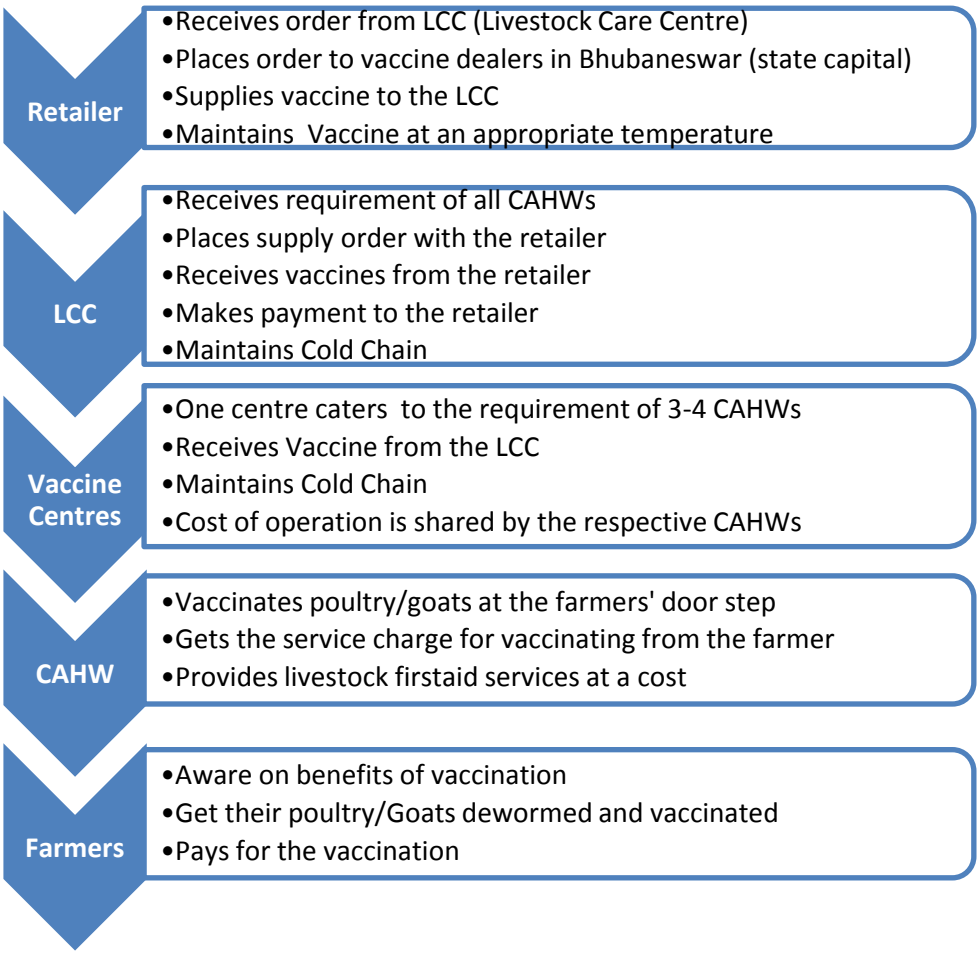
On receiving vaccine order from the CAHWs, the retailer sends the vaccine through local bus to the Livestock Care Centre (LCC). The Livestock Care Centre (LCC) is a service station run by CAHW to provide services on payment (First Aid, vaccinations, de-worming etc) to the poultry and small ruminants in the area. The centre stocks basic veterinary medicines and vaccines for all livestock to be sold to the fe/male farmers at a small profit so that the fe/male farmers buy the medicines at cheaper rates compared to other retailers and the LCC makes a small profit to sustain itself. The retailer receives payments next day through the same bus driver for the stock delivered at the LCC.

The project identified some young people from the community to serve as community animal health workers (CAHWs). These CAHWs were imparted training on poultry and goat vaccination, de-worming, first aid, good poultry and goat husbandry practices and cold chain management by the project. The training was given in a phased manner so that the CAHWs built up knowledge from field experience and formal trainings. From time to time refresher trainings were held. In all they received 16 days of technical and non-technical training.

The CAHW responsible for the Livestock Care Centre (LCC) receives the vaccine from the retailer and stores it in the refrigerator. From here the vaccine is collected by the CAHWs in charge of Vaccine Centres (VC) and stored in the refrigerators for further dissemination to farmers. Since distance from LCC to different villages was considerable, it was decided to have a refrigerator installed at strategic places (VC) so that the cold chain could be maintained and CAHWs could source vaccine closer to their area of operations. A VC caters the needs of 3-4 CAHWs and each CAHW provides vaccine cover to 6-8 villages

After the initial training in the month of June 2011 the CAHWs started providing their services as vaccinators. During the initial phase the project procured vaccines for the CAHWs. However to make the CAHWs independent of the project support, linking them directly with the supplier was necessary. Since September 2012, the CAHWs meet once a month to discuss their field experiences and calculate their vaccine requirements for the next month. All the CAHWs make payment towards the cost of vaccine in the monthly meeting and the payment to the retailer is made centrally at the LCC level.

Figure 1- Supply chain and role of each stakeholder



5. **Major Activities undertaken during the project period;**
   - **Selection of CAHWs from the community**- The project selected 36 youth from the community as prospective CAHWs. The local Panchayat Raj Institutions[1] (PRI) representatives, local veterinary department staff and the leaders of self-help groups were involved in the selection process. Out of the 36 youth, 27 that showed interest were imparted training by the project.
   - **Personal Leadership Development training-** A four days training program was organised for the 27 CAHWs to enhance their ability to interact with Farmers, organise village meetings and knowledge on livestock etc.
   - **Poultry Vaccination training-** A two days theoretical and one day practical training program was organised to train the CAHWs on poultry disease, type of vaccines, method of vaccination application, cold chain management. This was followed with a practical poultry vaccination camp in a nearby village.
   - **Livestock first aid training-** The CAHWs were trained on the basic first-aid treatment of livestock. They were trained on treatment of wound, internal and external parasites, Diarrhoea, bloat and other first- aid treatment of livestock. They were also trained on techniques of medicine application and ethno veterinary practices.
   - **Housing and nutrition training**- A training program on low-cost poultry housing and feed management was carried out for the CAHWs. The objective of the

[1] Panchayati Raj - a system of local Governance- a network assembly of wise and respected elders chosen and accepted by the local community)

training program was to enable CAHWs to disseminate the knowledge to the BYP keepers to improve poultry production using low cost local resources. In the two days training the CAHWs learned about different models of poultry housing, poultry equipment like feeder, drinker etc. And were trained to make these from locally available bamboo (feeders), white ant production and Azola cultivation as source of protein. They were also taught to formulate low cost supplementary feed using fishmeal at home etc.

- **Training on Cold Chain Management –** A special training program for cold chain management was also organised for the CAHWs, animal husbandry staff and retailer. In this training the CAHWs were educated on importance of maintaining vaccines in temperature range of 2-8 degrees Celsius. They were also trained to take appropriate measures to maintain the cold chain under difficult temperatures going up to 45 degrees Celsius during summer season.
- **Entrepreneurship Development Training -** The training focused on increasing the entrepreneurship ability of the CAHWs. They were trained on economics of BYP and other livestock, recordkeeping, profit and loss calculation, importance of robust vaccine supply chain, running a small poultry/goat farm and opportunities for getting microfinance through various government department schemes and livestock insurance etc. required to be a successful entrepreneur.
- **Vaccine supply and Cold Chain Management-**
  The most important issue for success of a vaccination program is the vaccine supply chain and management of cold chain. In order strengthen the supply chain the project identified a medicine shop in the locality and promoted it as a vaccine retailer. The retailer is now keeping most of the poultry vaccines and supplying to the CAHWs and to other agencies, farmers and even to the veterinary department. The vaccine supply is now established in the area.
  Initially CAHWs collected vaccine from LCCs and then went to villages to vaccinate. Since this took more than three hours of walking just to reach the village earmarked for vaccination, it was clear that vaccine supply points needed to be closer to the area of operation if cold chain was to be maintained and outreach increased. For this purpose, one LCC (at block level) instead of two would be fine while vaccine centres in villages were required. The project supported the CAHWs to install refrigerators and 6 vaccine centres were established to cater the needs of 22 CAHWs. Every vaccine centre is equipped with a refrigerator, cool boxes, cold packs, min-max thermometers to ensure cold chain is not compromised. Presently the LCC serves as a common platform for all CAHWs to meet, discuss and place orders. This LCC also stocks feed supplements, veterinary first aid medicines etc to remain viable and is run by a CAHW who places order, receives stock, and makes payment for the vaccine to the dealer.
- **Creating mass - awareness regarding ND vaccination in BYP Keepers:-**
  The BYP keepers were made aware on poultry disease and vaccination through village meetings, posters and banners etc. Extension material (see Annexure 1) was developed both for CAHWs to spread messages and for mass awareness. In the initial phase of the project village meetings on BYP vaccination were conducted in each village. Posters and Flex banners were developed focusing on the importance of BYP vaccination. The Flex banners were used at the strategic

locations like Village markets, cock fighting spots in weekly markets, bus stops etc in the project villages.

- **Liaison with government veterinary department:-**
  The project has tried to take the veterinary department in confidence right from the beginning i.e. Induction Workshop organized in by GALVmed in Bhubaneswar had participation of AHD Secretary, Director etc. This was important to make the animal husbandry staff perceive the project as a friend and not a foe. The project staff and the CAHWs attend the monthly meeting of the Animal Husbandry department at the field and district level. This enabled the CAHWs to establish a relationship with the department. The Veterinary surgeons participated in the training programs for CAHWs organised by the project and were made aware of ND and PPR vaccinations carried out in their area.

6. Outputs:-

- 22 active CAHWs providing vaccination, deworming and first aid service to the BYP farmers at the door step.
- Promoted a vaccine retailer at the district head quarter level to stock ND vaccines along with other poultry vaccines.
- 5 vaccine delivery centres and one livestock care centre established to maintain cold chain in the supply line
- Established vaccine supply network from the dealer to farmer level.
- De-worming and vaccination of backyard poultry is done as per calendar developed where possible despite constraints beyond control ie Elephant menace, Bird flu outbreak etc.
- 4^{th} phase vaccination was completed by the end of Oct,2012

Outcomes:-

- Farmers aware of Newcastle disease, demanding for timely vaccination and paying willingly.
- No incidence of Newcastle in the past one year shows the success of the intervention.
- The average flock size has increased from 19.70 birds to 30.18 birds and annual net income has increased from Rs 7,705 to Rs 16,774[2] per household.
- Farmers are paying for the vaccines and the service charge of the CAHWs for vaccination. This ensures sustainability of the project in long run.
- All the actors involved in the vaccine supply chain are giving priority to maintaining cold chain to ensure that potency of the vaccine remains intact.
- At Household level, there are increased returns from backyard poultry by the way of higher consumption and more money from sale of poultry.
- The CAHWs are earning within a range of INR.1200-4000 per month from providing vaccination, deworming and first-aid service to the farmers

7. Project Data

[2] Baseline survey and Final project evaluation report (Bases & Datos)

a- Table 1: ND vaccination pilot project- Numerical Data

Sl.No	Particulars		Target	Achievements
1	Project Villages		114	92 + 40 (outside of project area)
2	CAHWs Trained	Total	25	27
3		Male CAHWs	13	18
4		Female CAHWs	12	9
5	CAHWs Active	Total	20 (80% of 25)	22
6		Male CAHWs	10	16
7		Female CAHWs	10	6
8	No of training programs organised for CAHWs		--	6
9	No of village meetings/awareness		--	143
10	No. of Vaccine centres in operation		0	6
11	No of livestock care centre in operation		2	1
12	Total households covered-BYP(ND)		11450	9160
13	No of Vaccination Campaigns-BYP (ND)		4	4
14	No. of ND vaccines used		366400	264782
15	No. of poultry vaccinated (fowl pox)		0	21198
16	No of goats vaccinated		0	16160

b. Flock Status:-

The results of baseline survey and Final evaluation of flock size per family shows 153 %t growth in total poultry population. The number of poultry per flock increased from 19.70 to 30.18 within a period of 14 months. However the flock structure is different between the Final evaluation and the baseline survey. The table 2 shows the comparison of flock status during the two surveys;

Table 2: Flock Status

Flock Structure	Baseline survey	Final survey	Change in number	Change in percentage
Adult Female (Hen)	3.02	3.28	0.26	8.6
Adult Male (Cock)	0.65	4.12	3.47	533.85
Growers	6.39	10.06	3.67	57.43
Chicks	8.63	12.71	4.08	47.27
Total	19.7	30.18	10.48	53.2

The above table shows there is very little change in number of hen which implies Farmers prefer to maintain a 3 hen unit flock. The increase in the number of cock is the highest with 533.85 %. The cockerels in the region are used for cock fighting and are sold at a premium. This change is due to the availability of better health facilities from CAHWs and subsequently less mortality which has given farmers' confidence to retain bird for longer period. The increase in growers and chicks are identical with 57.43 % and 47.27 %

respectively. With the static hen population this points towards lesser mortality due to the ND vaccination.

8. Spillovers

a. By area:

i. After the success of ND vaccination in the project area the neighbouring villages are now inviting the CAHWs for ND vaccination in their villages.

ii. 50% of the CAHWs are providing vaccination services to about 40 additional villages out of project area. This includes 20 villages in the neighbouring state of West Bengal. (As per the list provided by the respective CAHWs providing vaccination services)

iii. The BYP keepers of the neighbouring villages are making advance payment for the service charge of the CAHWs for vaccination.

b. By species:

i. The success of the project in reducing the mortality in poultry has inspired Farmers to vaccinate other animals like goat and sheep.

ii. Now the CAHWs are deworming the goats, sheep, pigs and all poultry birds. The Farmers are paying for all deworming of animal and birds.

iii. Under the supervision of local veterinary department staff, the CAHWs are even vaccinating the large ruminants. The vaccine is provided by the AHD but the CAHWs get paid for providing services.

c. By diseases:

i. The success of ND vaccination has motivated the BYP keepers to vaccinate their stock against other poultry diseases. The CAHWs have already started vaccinating the BYP against Fowl Pox.

ii. The CAHWs are vaccinating the goats and sheep against PPR and there is a demand for vaccination against FMD and other diseases.

d. By organization:

i. The district veterinary department has acknowledged the success of the project and requested support in vaccinating against ND in the Bird flu affected area which was beyond project area. They are also using project equipment to maintain cold chain.

9. Financials

Budget reconciliation can be seen in the Table 3 below. Final variance of 519,163 INR is being used for the non-cost extension granted until April 2013. A final reconciliation will be provided then.

10. Lessons learnt

- CAHWs
  - Couples that are working as CAHWs are performing better amongst CAHWs
  - Training on first-aid and other aspects of animal husbandry adds value to the vaccination program
  - Increasing the income of CAHWs by capacitating them on other livestock related activities is a motivating force for them to continue.
  - Increasing capacity of the CAHWs on social mobilisation (art of conducting meetings, interaction with villagers, etc.) helps them to build rapport among the villagers.
  - Motivation of CAHWs through refresher trainings and meetings on periodic basis during project period would help building confidence of CAHWs.

- Supply Chain
  - Vaccine storage points (Refrigerator points) closer to CAHWs area of operations increase their outreach and performance.
  - Maintaining vaccine temperature on at the field level is one of the most important part a successful vaccination program
  - Vaccine supply centres that can be accessed locally have better results.
  - Involving the government veterinary department in different programs like selection of CAHWs, village meetings, awareness of PRI members, initial deworming and vaccination drives etc. increases the faith of the farmers in the ability and credibility of CAHWs.

- Farmers
  - Farmers are ready to pay for vaccination if they get regular and quality service
  - Initial mass-awareness and sensitisation of the farmer is crucial for their voluntary participation in vaccination program
  - There is a need to focus on vaccination of different poultry diseases (e.g. Fowl Pox) rather than focusing on a single disease. Sometimes deaths due other diseases (like Bird-flu) affect the faith of the farmers on the program.

- Sustainability
  - Coordination with govt. veterinary department is essential for CAHWs to remain viable and successful in continuing vaccination program for small stock
  - Vaccination with R2B strain is difficult in backyard poultry (multi age flock)
  - Charging for the vaccines from the 1st campaign has better chance of sustainability than going in for initial free vaccination campaigns.
  - For sustainability of the project and the CAHWs, the knowledge of CAHWs on other poultry, small ruminants and pig diseases and their preventative

measures should be enhanced. This will boost their confidence and enable them to cover larger areas and make decent income.

11. Conclusion and recommendations

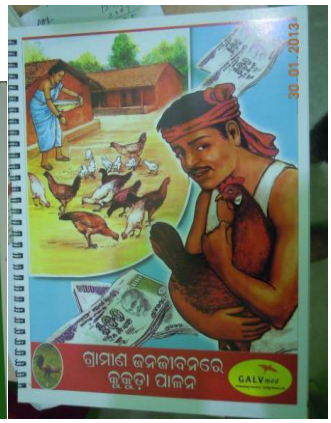
- Holistic approach ensured that along with ND vaccination, good practices in housing, feeding, and poultry keeping were introduced to make poultry production more profitable to farmers. The project interventions have ensured a steady monthly income of around INR 3,000 for CAHWs, an average increased annual net poultry income by 9,069 INR (approx. USD 166) per household, increase in protein intake by households and empowerment of women through increased participation in decision making within their households. Apart from ND vaccination the CAHWs provide services like poultry de-worming, fowl pox vaccination, goat deworming, goat PPR vaccination and pig deworming.

The project is now sustaining without direct project support. However, the following are few points which need to be focused while planning for improving the impact;

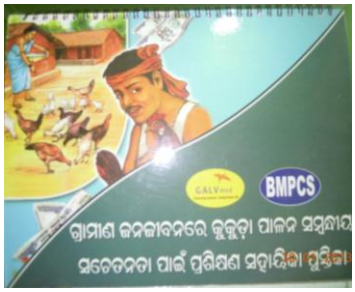
- Any BYP vaccination program should include other major preventable disease of poultry like fowl pox.
- There should be a legal status of the CAHWs for providing vaccination and first-aid service.
- The vaccination should be chargeable from the beginning. This will not develop the attitude of getting services free.

Annexure1: Extension materials developed and used in the Project

Wall poster vaccination



Handbook on Poultry Production



Flipchart on BYP management

Case Study from the field

Bijay Kumar Das, around 35 year old man used to earn his livelihood from seasonal vegetable marketing in the local market when his name was recommended for CAHW by the Sarpanch (Village leader) of Sana Mundhabani Gram Panchayat in April 2011. He had studied up to intermediate but was forced to discontinue his studies to support his father and contribute to household income. Every year he had to migrate to the bordering district for 3-4 months in search of job.

He was selected as a CAHW and trained by the project in vaccination of poultry and small ruminants against ND and PPR diseases. Through latter trainings, he learnt first aid treatment of livestock, castration, good husbandry practices related to feeding, housing etc. During the training programs he showed remarkable interest in learning more about vaccination of not only poultry but also about other livestock as well. The classroom interest was also reflected in the field where he achieved high number of vaccinations.

BYP vaccination in the project area is normally done in the evening and the CAHWs are free for rest of the day. He utilised the day time for gaining more experience by assisting the veterinary doctor of the local dispensary. Presently he is providing services like treatment for internal and external parasites, castration, livestock first aid service, following up the prescription of the veterinary doctors etc. He is covering BYP and goat vaccination and deworming service in 9 villages in the project area and another 7 villages outside the project area. His average monthly income from this service is nearly five thousand rupees (Rs 5000).

Looking at his dedication and interest in the vaccination work, the project supported him with a refrigerator to manage the cold chain of vaccines and run it as a vaccine storage centre. 4 other CAHWs are dependent on this refrigerator and due to its strategic placement, more birds are getting vaccinated.

Entrepreneurship development training was provided by the project to inculcate business sense in the CAHWs so that they engage in small livestock related business and continue to remain in the village, thus providing vaccinations to Backyard poultry and goats. Translating the learnings into action, Bijay has started a small chick rearing unit that has capacity to rear a batch of 100 chicks for 28 days and then sell them off to poultry farmers. As per his calculation he is earning nearly one thousand five hundred rupees (Rs 1500) per batch.

He believes that with higher training and experience he can earn even more. He proudly says "*The project has changed my life."*

Some Pictures

ND awareness meeting in Village

White-ant harvesting training

Woman poultry rearer with her flock

Private retailer at block level

CAHWs with the refrigerator at vaccine storage centre

CAHW proudly displaying her new profession