



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

FINAL EVALUATION

25th January, 2013

Executive summary

Backyard poultry (BYP) have a major role to play in the farming system of smallholder farmers in Nepal because it forms a means of celebrations, source of protein and small income when required. Factors such as low cost of production including land and labour input needed have made BYP a continued means of supplementary income in rural areas. However the lack of knowledge of improved backyard poultry husbandry practices to the farmers and also lack of sustainable system to battle the causes of poultry disease/mortality are major hurdles to become a complementary means of income for farmers. The Newcastle Disease (ND) Pilot Project under a partnership between Heifer Project Nepal and GALVmed was designed to mitigate the above mentioned problems. A sustainable supply chain of poultry medicine, vaccines, and technical services was established by empowering all related stakeholders on improved backyard poultry health, husbandry, cold-chain maintenance, and vaccination. This model is expected to be sustainable as all stakeholders were shown to benefit from it.

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 June 2012 after the last vaccination.

The project covered 2,300 households in Jhapa District (South East Nepal). The results based on random questionnaires to 100 households showed:

1. The number of poultry per household increased from 11.23 at the beginning to 31.90 at the end of the project period. This increase could have been due to a lack of ND outbreaks (that were typically seen twice per year before the project) or to an improvement in poultry management or both during the project period.
2. The weekly intake of meat and/or fish in the diet increased by an average of 0.842 times a week per household.
3. Weekly egg production increased by 2.04 eggs a week per household, and monthly poultry production per household increased by 2.25 times (from 5.47 to 12.30 poultry produced per month per household).



4. The net annual poultry income increased in average by 47,391 NPR (approx USD 535 at the time of the report) per household after the project intervention.

The project was successful in making behavioural changes in the mind-set of farmers to voluntarily get birds vaccinated and pay for the services. The project made a considerable impact as neighbouring villages and other organizations are replicating the model. This model shows signs of sustainability as farmers are now demanding not only ND vaccination but also fowl pox vaccinations from Community Animal Health Workers (CAHWs) and are readily paying for the same. It can be safely claimed that the project has contributed to solving the overarching problems of poverty, food security, malnourishment and gender discrimination prevalent in the project area, an increase in income through BYP, increase in food security and, a sense of wellbeing especially amongst women who are major beneficiaries of the project.

Newcastle Disease Pilot Project Nepal

Preliminary Project Completion Report May 2012

A: Summary

Backyard poultry (BYP) has a major role to play in the farming system of smallholder farmers in Nepal since it acts as a means of celebration, source of protein and small income when required. Factors like low cost of production, including minimal land and labor input needed, have made BYP a continued means of supplementary income in rural areas. But it has never grown to become a complementary means of income for farmers due of the following reasons:

1. knowledge of good husbandry practices to make BYP into a profitable agri-business are lacking and
2. Lack of a sustainable system to battle the causes of various poultry diseases and mortality.

Newcastle disease (ND) is one of the major causes of high poultry mortality. Although vaccines are available, they are used mostly in commercial poultry farms. Backyard poultry keepers are unaware of the preventive measures that can save their birds. Even amongst the commercial poultry farmers who are aware of the vaccines and are using it, maximum benefits are not achieved because often cold chain has not been maintained properly. It was found that vaccine sellers and people inoculating were not aware of the importance of maintaining cold chain and /or were unable to do so because of the lack of appliances needed.

Newcastle Disease Pilot Project in Jhapa Nepal was a partnership between Heifer Project Nepal and GALVmed designed to mitigate the above mentioned problems by:

1. Making fe/male backyard poultry farmers aware, empowered, conscious and proactive in poultry keeping and in seeking health services for their poultry
2. Training and motivating Community Animal Health Workers (CAHW) to provide health services to Backyard poultry farmers in a sustainable manner
3. Ensuring quality vaccines are available with the retailers and quality is not compromised due to a break in the cold chain at all levels.

The ND Pilot Project carried out four categories of activities that contributed to the above goals: Social mobilization and empowerment of poultry farmers

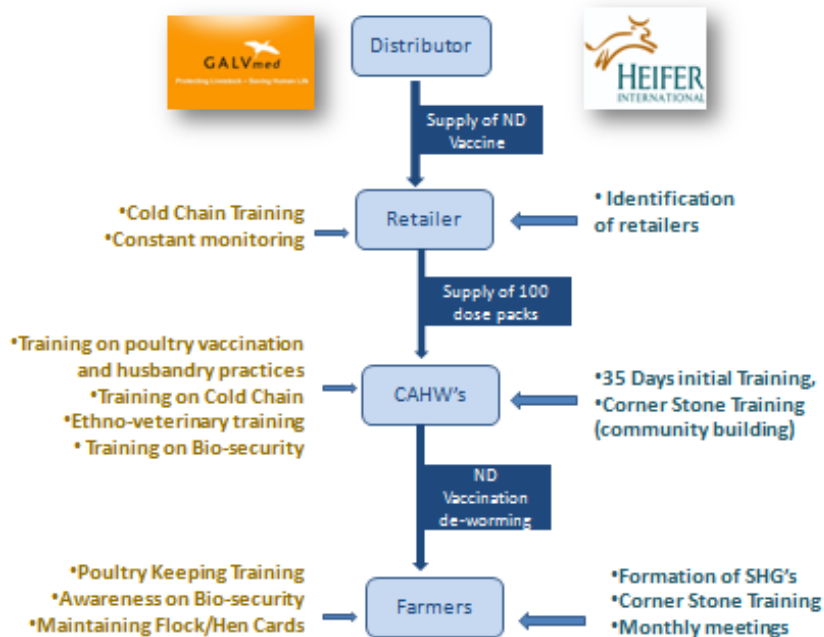
1. Coordinate Technical service providers' (CAHWs) capacity development to effectively administer ND vaccines
2. Provide knowledge and technical support on cold chains to CAHWs, retailers and Livestock Services employees responsible for stocking Government vaccines
3. Creating awareness on all aspects related to ND through FM radio, pamphlets, and roadside bill boards.

This project which started in April 2011 and lasted for a year, had aimed at vaccinating poultry reared by 1,900 households and it achieved vaccinating approximately 20,062 poultry (60,152 vaccinations were done over 4 campaigns) and 2,300 households. The project has been successful in making behavioral changes in the mindsets of farmers, from no vaccination to voluntarily getting birds vaccinated, and finally to paying for the services. The project has made a considerable impact as neighboring villages and other organizations are replicating the model. This model shows signs of sustainability as farmers are demanding not only ND vaccinations and are readily paying for the same but also asking for fowl pox vaccinations from the CAHWs. The retailers have begun stocking the small pack size (100 doses) of the Lasota vaccine and their sales have increased post the project. Both the CAHWs and the retailers are aware and are practicing the maintenance of cold chain while storing and transporting ND vaccine. Maintaining cold chain of vaccine has been effective as no outbreak of ND was reported in the past one year implying vaccine cold chain was not compromised.

It can be claimed that the project has contributed in solving the overarching problems of poverty, food security, and malnourishment, gender discrimination as it has led to an increase in HH income, increase in food security and a sense of well being especially amongst women who are the major beneficiaries of the project.

B: The Model

The different stakeholders and their role in the value chain is shown below:



In Nepal, ND vaccine is produced by the Central Biological Production Laboratory (CBPL) in Kathmandu and sold to local distributors. However, CBPL produced vaccine is not sufficient to meet the local demand and both Lasota and R2B vaccines are imported by the distributors. In the project area imported Lasota vaccines were used. The distributors transport the vaccines to district headquarters using cold boxes through road transport or by air and retailers stock the vaccines received in domestic refrigerators.

The country has a robust system in place for providing animal health services through Community Animal Health Worker (CAHW) who undergo 35 days institutionalized training on different aspects of animal health and running an agri-business. However the training is focused on large ruminants and to a small extent on small ruminants and commercial poultry, while backyard poultry is not covered at all. This weak link was strengthened in the project by designing tailor made trainings for CAHWs on backyard poultry keeping, their vaccination and maintaining cold chain properly while transporting, storing and administering vaccines.

Major activities carried out through project are listed below-

- A four day training of CAHWs was conducted on common diseases in Backyard poultry, good husbandry practices including balanced feeding, housing, de-worming, ethno-veterinary medicine for common ailments etc (See pictures in annex 1). CAHWs were trained to be aware of the symptoms of the disease and take preventive measures when occurrence of a disease is proven through lab tests. This training was facilitated by BYP consultants from a non government organization-Anthra (India) and a technical expert from Heifer International Nepal.
- CAHWs were trained to vaccinate birds against ND (See pictures in Annex 2). They gained practical skills of transporting vaccine using cool box, reconstitution of vaccine with the diluents and the correct intraocular administration techniques. In the project, intra-ocular Lasota ND vaccine was used every three months.
- Training was imparted to CAHWs, Government Livestock services staff and local retailers on the importance of maintaining cold chain and the means of doing it. 8 retailers, 2 Livestock services staff, 5 CAHWs and 4 NGO field staff participated in the training (See pictures in annex 3) They were made aware of the importance of maintaining cold chain right from production up till the point when it was to be administered. The training mainly focused on the system of transporting and storing vaccines including using minimum maximum thermometers to maintain this system. Initial training was followed up with A day's refresher conducted by Prof Mary Young of Kyeema foundation.
- BYP keepers were trained by CAHWs to adopt good husbandry practices in poultry keeping, made aware of ND vaccination and de worming, use of local herbs and bio-security measures. They were enlightened on the

economics of rearing poultry to see for themselves the business opportunity through this activity. Monthly SHG meetings helped in reinforcing these issues. (See pictures in annex 4).

- Extensive knowledge transmission was done through posters, pamphlets, mobile vans with loud speakers, talk programs on FM radio, roadside hoardings etc. (See Annex 5)
- Installation of a refrigerator under the supervision of a CAHW where vaccines can be stored for easy access by other CAHWs.

Outcomes:

- Increase in productivity and decrease in mortality as a result of two initial free ND vaccinations has motivated BYP keepers to pay for vaccines in subsequent campaigns. The farmers have seen the benefits of the vaccination they are more than willing to pay for it. The fee per dose of vaccine including service charge, transportation and electricity supply was decided in a meeting of the SHGs representatives, the CAHWs, Community facilitators and some local stake holders and all BYP keepers agreed to pay this amount.
- Timely de-worming, vaccination, use of local herbs to control internal and external parasites has increased the immunity of birds to fight infection.
- Since CAHW's are selling vaccines to BYP keepers while including their service charges, it is contributing towards the projects goal of creating a sustainable value chain for vaccines.
- Retailers, who were given training on cold chain maintenance, now know what a quality vaccine means. Periodic checking of the refrigerator's condition, keeping a thermometer to check at which vaccines is stored, maintaining temperature log frame and its analysis has become a routine for them.
- Demand for vaccines from CAHWs is received well in advance and now the retailers always stock enough vaccines of 100 dose packs to meet the demand on time.

C: Data

Project Partners: The project was implemented in cooperation with two local NGO Abhayan Nepal and Jaleswor Swabhalamban Samaj of Jhapa district considering their strong presence in the project areas. These two local NGOs are Heifer Project International Nepal's (HPIN) project partners working at the grass root level. They already had Community Facilitators (CFs) and trained Community Animal Health Workers (CAHWs) and further socially empowered organized Self-help Groups (SHGs). The pilot project mobilized these trained human resources to implement the project effectively and efficiently.

Area Covered: Project covered Arjundhara and Khudnabari VDCs of Jhapa district. The project was implemented in Arjundhara (Ward 3, 4, 5) and Khudnabari (Ward 2, 4, 5 and 6) VDCs of Jhapa district and included 1900 poultry keeping households. Jhapa is the easternmost district of Nepal and lies in the fertile Terai plains. It borders Ilam district in the north, Morang district in the west, the Indian state of Bihar in the south and east, and the Indian state of West Bengal in the east. The project site is around 20 km from the Indian border.



This area falls under high risk disease zone as the Indian border is only a short distance away and there is open cross border poultry trade. There have been outbreaks of Avian Influenza (AI) in Indian as well as Nepalese side making ND vaccinations more important to rule out ND in case of AI outbreaks.

Mortality due to ND was the most limiting factor in BY poultry production in this area. There used to be regular bi-annual outbreak (one in March – April and the other in August – September) of ND in which chicken mortality was up to

90 %. There was no awareness on basic health care, de-worming and vaccination for BYP. These adverse factors were taken into account while selecting villages for Newcastle disease pilot project.

No.	Particulars	Target	Achieved
1	CAHWs trained Male	1	1
	CAHWs trained Female	4	4
2	CAHWs active male	1	1
	CAHWs active female	4	4
3	Total BYP HH covered	1,900	2,300
4	Total vaccination campaigns	4	4
5	Total vaccinations done	60,152	
	a) Free vaccination done in 1 st campaign	11,994	
	b) Free vaccination done in 2nd campaign	13,503	
	c) Paid vaccination done in 3rd campaign	14,593	
	d) Paid vaccination done in 4 th campaign	20,062	

Table 1: Project data

No.	Parameters	Before project intervention	After project intervention #
1	No. of clutch per year	2 – 3	4-6 *
2	No. of eggs laying in each clutch (average)	18	18
3	Hatchability percentage (average)	60 %	86 %
4	Mortality rate due to diseases	90%	15 -20%
5	Flock size per house hold (Average)	6	30
6	Income from per bird per year (Avg.)	NPR 3,600 (USD 41)	NPR 15,000 (USD 171)

Table 2: Estimated Productivity and income data

These are conservative estimates based on Flock records maintained by sample HHs, clearer picture would emerge after impact survey is conducted.

* When chicks are separated from mother hen, the hen comes into lay earlier than usual increasing the number of clutches in a year.

Analysis and interpretation of key data (Table 1 & 2) during the project

- In total, 5 CAHWs were trained in cold chain maintenance and appropriate vaccination administration techniques. These CAHWs are now very active and have been conducting paid vaccination campaigns.
- All the planned vaccine campaigns were conducted successfully. Even though the first two vaccination campaigns were free, it was still a little difficult to convince BYP keepers to accept vaccination for poultry initially. But once they realized the value of this activity, they began asking for forthcoming vaccination campaigns. Due to this fact, the 3rd and 4th paid vaccination campaigns were easily accomplished and were paid for.
- Outbreaks of ND causing 90% mortality were regularly seen during the months of March- April and August – September. However, no outbreaks have been observed after the vaccinations started in June 2011 The increase in poultry population over the year in the project area is justified by looking at the increase in vaccination trend of each campaign.
- At the start of the project, the target was to cover 1900 BYP keeper households. As soon the Poultry keeping households (HHs) were organized in Self Help Groups (SHGs), other non BYP keeper farmers bought few poultry

and showed their interest in rearing BYP and they too were provided services by CAHWs. Thus, the number of HHs increased by 400.

- More vaccines are being sold after the initial 2 free campaigns that resulted in positive results in controlling ND and increasing profitability for all stakeholders- farmers, CAHWs and retailers.
- Decrease in mortality due to ND vaccination has contributed to an increase in flock size and consequently to an increase in income.
- Due to the training given on improved husbandry, balanced feeding and appropriate brooding techniques, the egg production and hatchability percentage has increased. There has been a significant increase in the number of clutches per chicken and this resulting in increased flock size.

D: Lessons learnt

Lessons learnt have been categorized under the categories of activities.

1. Social mobilization and empowerment

- Working with women's groups improved chances of adoption and expansion. Farmers in this setup were more communicative of their concerns and confusion.
- Heifer cornerstones training have helped in making the participant more open to new ideas. There was an increased sense of comradeship and support amongst the farmers after the training.
- Having a local CAHW was useful in understanding the challenges faced by farmers. Similarities in language and culture helped to create deeper bonds that prove beneficial to the project outcomes.
- Using CAHW's for social mobilization with the community facilitator also helped him\her improve his\her social ties eventually benefitting the whole farm community.

2. CAHWs capacity development and coordination

- Coordination amongst CAHWs helped them to prepare, coordinate and find solutions to the problems they were facing together.
- Having a Vet oversee the CAHWs improved their chances of being respected and accepted as a para-vet by the farmers. It also improved CAHWs knowledge about other veterinary practices and diseases which would eventually be beneficial to farmers.
- CAHWs with the technical backing of the Vet were made confident enough to address other diseases of poultry and also livestock through pre-emptive measures like making farmers aware of eminent danger of ND outbreak and keeping vaccines in stock.
- Cold boxes and refrigerators provided through the project helped in stocking vaccines before expected outbreaks.
- CAHWs are motivated to pursue this occupation and are seeking ways of making it sustainable and mutually profitable to themselves and to the farmers.
- Keeping record of the min and max temperatures daily using a min-max thermometer attached to the refrigerator will help monitor the efficacy of the stored vaccines.

3. Providing knowledge and technical support needed to effectively administer ND vaccines

- A major drawback of vaccination process in Nepal was the failure in maintaining cold chain. This was mitigated through trainings of the CAHW's, retailers, local stock keeper, regional stock keepers, and vets from Government District Livestock Services Office.
- Physical inputs like cold boxes and refrigerators are crucial to the success of the vaccination.
- Incorporating local stakeholders in trainings and meetings have a huge impact in replicating impacts and disseminating best practices.

4. Replicate knowledge and impact

- Local level meetings and trainings were helpful to not only target the families but also the whole community.
- Local FM talk shows, posters and pamphlets were efficient means of communication.
- Coordination with government service providers helps in replication in other areas.

- Knowledge and practice of Bio-security measures by farmers can contribute in limiting the further spread of Avian Influenza in the BY poultry.

E: Spillovers

1. By area:

- Arjun Paudel, a progressive farmer from Illam district (50 Kms from Jhapa) replicated the BYP keeping model after an exposure visit to ND project area. His success with BY Poultry has motivated other local farmers in Illam to take up the model.
- Some ex- Heifer self help groups of Sundarpur, Morang district, (80 Kms from Jhapa), were oriented on the effect of vaccination against ND. This has motivated them to ask local CAHWs to make ND vaccines available to them.
- Another Heifer partner NGO MBMAN has also replicated the model in Morang, a geographically and socio-economically remote area.

2. By species:

The main objective was to create sustainable vaccine delivery system that ensured Backyard poultry and ducks were vaccinated against ND; but due to awareness on advantages of disease prevention taken up in the Pilot project, it opened up farmers to vaccinate their livestock against other diseases as well.

- Cattle and buffaloes, goats, pig, backyard poultry, duck and turkey in the project community have also been de-wormed by CAHWs as a result of awareness trainings to farmers.
- The ND Pilot Project made farmers aware of the vaccination for prevention of PPR in small ruminants. It linked farmers to Government Veterinary Office to establish easy supply PPR vaccines as the vaccine is only supplied through Government. Through this intervention 4,668 goats were vaccinated on time against PPR to prevent the outbreak of disease in the area.
- Confidence in the concept of vaccination and preventive health care has increased in the farmers and as a result more number of cattle and buffaloes have been vaccinated against Hemorrhagic Septicemia and Black Quarter by the CAHWs

3. By diseases:

- Farmers are now keen to vaccinate poultry against Fowl pox.
- Prevention of bird flu in the project area to an extent was possible due to massive awareness campaign taken up by project staff on bio-security measures to be followed by community.

4. By organization:

- Free one day backyard poultry management training was given by ND Project coordinator Dr Sita Acharya to Daijhoda community forest user group and Thople Biram Community forest user group. Jhapa Poultry Farming Sheltererative and Luthern Foundation have requested for training for their stakeholders and farmers.
- ND pilot project staff organized animal health camp under the technical guidance of government vets and para-vets in which 1300 animal including buffalos were treated and de-wormed. The de-wormers and other medicines for the camp were supplied by veterinary pharmaceutical companies. This activity was not a part of ND project but carried out as relation building exercise. In Nepalese village conditions, farmers' rear mixed type of animals and many of the farmers who keep BYP, also rear goats and large animals. So this camp was organized to look at the livestock health holistically and sensitize farmers on preventive health care for all livestock.
- Heifer international Nepal has learned a new model of controlling ND outbreaks and soon the organization is going to streamline pilot project activities in Heifer's BYP keeper pocket areas.

5. Other spillover impacts:

- *The positive* outcomes of improved husbandry, de-worming and vaccination have increased BYP farmers' profitability visibly. This has resulted in families and communities outside the reach of the project adopting the same techniques.
- CAHWs are being approached by more and more farmers for vaccines and treatment of other diseases.
- Families around the project area are also increasing the numbers of BYP they want to turn it into a key income generating activity.
- Project area is becoming the resource center for backyard poultry farming.
- Coverage by media: Kantipur national news has covered the achievements. Nepal Television, the national broadcaster has broadcasted the achievements in Krishi Samachar (Agricultural news).
- Local FM stations have conducted programs on the project for their farmer audiences.

Himshikhar television, local television of eastern region has covered the project.

F: Conclusions including sustainability of the project

- Farmers, CAHWs and vaccine retailers at various level of engagement are benefitting from the project. Farmers are increasing profits through BYP. CAHW's are advocating vaccination and other medicines and creating a demand driven model for vaccines and medicines. On an average, each CAHW earned at least NRs. 15000 (USD 172) during 3rd and 4th paid de-worming and vaccination campaigns. These campaigns provided an opportunity for CAHWs to establish relationship with farmers and to earn more by treating and vaccinating large and small animals. Local and regional stockists are also excited with the increase in demand of ND vaccines roughly by 5 %.
- An ethical value chain system for vaccines has been established. This model is expected to be sustainable as all stakeholders benefit from it and each is dependent on the other to make livelihood. To ensure that the supply chain remains viable, actions have been taken at all stake holder levels; like establishing cost recovery methods of vaccine delivery and administration system, helping CAHWs to analyse cold chain to ensure that the vaccine is of best quality, delivery at farmers' doorstep, ensure cold chain maintenance at all levels, continuity of regular vaccine supply chain from retailers to CAHWs.
- BYP keepers are acknowledging that backyard poultry farming can contribute substantially to household income and are ready to invest in preventive health care.
- Local level stakeholders and veterinary officers of the Animal health department are very enthusiastic about this model. They are planning to replicate this model of de-worming followed by ND vaccination to more Villages of Jhapa district next year.

G: Recommendations

- BYP and other livestock and poultry related intervention programs should be incorporated with social mobilization programs for better acceptance and impact.
- Farmers believe more in word of mouth from other farmers like them. Therefore inception project should be small and better communicated so more and more farmers can see the impacts of the inception project and then implement the outcomes in their farms at no additional cost to the project funders.
- Vaccination and other livestock extension services should be promoted as commodities. Establishing proper value chains where all parties receive a fair share of the profit ensures the sustainability and promotion of such services.

Annex 1: Training of CAHWs on Backyard Poultry



Annex 2: CAHWs being trained in ND Vaccination



Annex 3: Cold chain training for CAHWs, retailers, and government veterinarians



Annex 4: Training of Farmers on Poultry keeping, preventive health and bio-security





Annex 5: Roadside advertising for creating awareness around ND and its prevention

चराचुरुङ्गी/कुसुरालाई रोकबाट टाढा राख्नको लागि



1. चराचुरुङ्गी कुसुरालाई २५ से घण्टा सफा भाँडामा सफा पिउने पानीको रूपमा गर्नुपर्छ ।
2. रोग रोकथामका लागि पिउने पानीमा धेरै बेसार अथवा पोटासियम परम्यांगनेट मिलाउनु पर्छ ।
3. जाडोको र वर्षाको समयमा कुसुरालाई खानामा लसुन मिसाउनु पर्छ । गर्मीको समयमा खानामा मसिनो गरी ध्याज काटेर मिसाउनु पर्छ ।
4. समय-समयमा कुसुरालाई परजोवि (जूका) विरूद्ध औषधि खुवाउनु पर्छ ।
5. घरको बाहिरी भागमा राख्नु पर्छ । आवश्यक परेमा लामसुटे, भिन्ना, भुसनाहुराबाट बच्नको लागि नीस, निगन्द, तुलसी, सुतीको पातको पुवा दिनुपर्छ ।
6. रानीसैत रोग र कुसुराको विफर रोकथामको लागि उपयुक्त समयमा खोप लगाउनु पर्छ ।



Annex 6: Short case studies

Manamaya's Story:

Manamaya Karki was not enthusiastic about back yard poultry at all. She had one chicken and a few chicks. Every 2 – 3 months the chickens would die of ND and they would have to buy chicks again. They did not have any type of shelter for the chickens. Eggs were used for family consumption only. Things changed after she took a day's training through the ND pilot project. Her grandson was also very excited about the prospects and promised to help his grandmother all he could. The family built an eight foot high compound with bamboo and built a shelter. Manamaya invested in 10 more chickens. They have vaccinated the chickens four times for ND and also de-worm them timely. "After we de-wormed and vaccinated the chickens the first time there was an outbreak. None of our chickens died," says Manamaya. Manamaya has made a profit of 20,000 rupees since. She now has 10 chickens and 60 chicks and a very good source of income for her family. Her grandson now has a good source of protein readily available in the house.



Radhika's story:

Radhika Thapa's husband is a migrant labor. It takes time for her husband to remit money for her and her children. A small snack stall and her backyard kitchen garden are her only sources of income. The family does not have much land to depend on.

Radhika became a part of the ND pilot project and learned about BYP. She had 1 chicken and a few chicks. After the training with ways to save chickens from an outbreak she felt that she would benefit from additional chickens. She built a shelter and added 15 more chicks from some money from her shop. She also started de-worming and vaccinating them as she had learned in the trainings. Today she can fall back on the income for the BYP for a living when her husband is unable to send money regularly. BYP is a good income option for women farmers who do not have much land. Timely de-worming and vaccination can make it a profitable enterprise.

