



# Strengthening the Backyard Poultry

Experiences of AP  
Drought Adaptation Initiative (AP DAI)



Process Steps



THE WORLD BANK





## STRENGTHENING THE BACKYARD POULTRY

### Processes from the Experiences of AP Drought Adaptation Initiative (AP DAI)

#### **About the Process Manual**

This process manual has emerged from experiences gained in the AP Drought Adaptation Initiative (AP DAI)<sup>1</sup>, building on earlier experiences of WASSAN. The experiences have emerged from working with the Mandal Mahila Samakhyas (Federation of SHGs) in Mahabubnagar and Anantapur districts of Andhra Pradesh.

The process manual captures the essence of experiences from field work. It provides a road-map and process steps for organizations that wish to initiate programs to strengthen backyard poultry.

Though the experiences in APDAI started from introducing 'improved' birds from research institutions, it has been realized that improving the management systems and easing the constraints in traditional backyard poultry with local breeds is more important and yields more sustained results.

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<sup>1</sup> AP DAI is a pilot program to evolve various drought adaptation measures. It is anchored by the Rural Development Department of the Government of Andhra Pradesh and is supported by the World Bank.





## CHAPTER - I

# SETTING THE STAGE

### Why Backyard Poultry is important?

Even after a quantum leap in industrial poultry production, backyard poultry constitutes more than half of the country's poultry population; it constitutes 27% of the total poultry population in Andhra Pradesh. And 21% of the national egg production<sup>2</sup>. The importance of backyard poultry also lies in the fact that there is no dedicated land required to feed it; industrial poultry production requires large allocation of land and water for poultry feed crops. More than its contribution to national poultry production, backyard poultry makes a significant contribution to the livelihoods of poorer households in terms of nutrition, income, asset building and fulfilling some religious rights. It is also a liquid asset that can be sold quickly to meet any emergency cash needs of poorer families.

Field experiences have amply demonstrated that backyard poultry provides supplementary incomes, mostly in the hands of women. These incomes and assets are essential supplements for surviving droughts, at least for the people at the margin. There are several cases of backyard poultry leading into an economic growth path for the poorest, where the primary capital came from selling off the birds reared in their backyard. These supplementary

incomes are mostly independent of weather patterns and are secure once diseases are managed, as the market and prices are assured.

Perhaps the most important feature of backyard poultry lies in that the supplementary incomes are wide-spread across different households and can be achieved with minimal inputs. Well managed backyard poultry can easily give returns almost equal to an acre of dry land! With this in view, the AP DAI program promoted backyard poultry as an essential drought adaptation measure.

### The Case of Mallamma in Gundlapally village, Kosgi Mandal, Mahabubnagar district

Mallamma has a family of seven members, four adults and three children. She has a total land holding of 3 acres, which is mainly dry land, in which Till, Jowar and Redgram are cultivated. In 2008, she invested Rs.2000 on that land and got an income of Rs. 3000 from Till, Rs 1000 from Jowar and Rs.2000 from Redgram. The total net profit was Rs.4000 from 3 acres, which means Rs.1333 per acre.

She purchased 50 chicks of 4-6 weeks old, in four phases, in a year. It cost around Rs.1540. While rearing, 15 birds died due to predation. One bird was consumed in the family. She reared the other remaining birds upto 7-8 months of age. The birds gained approximately 2 kgs of body weight at the age of 7-8 months, in scavenging system.

Local price per kilogram of live bird was ranging from Rs.75/- to Rs 150/-, based on weight. By selling 34 birds, she earned Rs.4945. Three hens layed eggs, they consumed some and sold other 110 eggs in the village, thus gaining an income of Rs.270. Finally she got a net profit of Rs 3925 in 15 months of time, which was more than her earnings from her dry land!

<sup>2</sup> Source: Basic Animal Husbandry Statistics, 2006; Department of Animal Husbandry and Fisheries, Ministry of Agriculture, Government of India.





## What is Backyard Poultry

In general, rural back yard poultry is a low-input and low output system managed by women and children of the households. Sourcing feed from scavenging and auto-regeneration are the two important aspects of backyard poultry. The generic features of this system are:

- ❖ Typical flock size ranges between 5 - 25 birds
- ❖ Birds are raised under a scavenging system without special inputs in terms of feeding, housing or labor.
- ❖ Mainly local birds are reared although there are specific/specialized indigenous breeds in some geographical areas. These breeds represent a rich source of disease resistant germplasm.
- ❖ The system auto-regenerates as the chicks are usually obtained by hatching locally.
- ❖ In most of the cases, eggs produced are for home consumption or for limited trade within the village.

- ❖ The production performance of these birds is about 40-60 eggs per annum and about 1-1.5 Kg meat at the end of the production cycle. It is a sustainable system with low dependency on external agencies.

Recently, several synthetic breeds are promoted by Government and Private Industries, where day old chicks (DoC) or 2-3 week old chicks are reared with the intention of selling the cockrel for meat purpose while retaining hens for egg laying since they lay 120-180 eggs per laying cycle. These birds do not brood and fresh chicks have to be sourced each time from private/government hatchery. Greater care needs to be taken as these birds are highly vulnerable to diseases. They respond in terms of production to feed supplementation. In several such cases a mix of local and synthetic birds are reared together.

Semi-intensive, intensive and industrial systems of poultry production are pure enterprises taken up with dedicated resources (land, labor and capital) and are completely different from backyard poultry.





## CHAPTER - II

# SETTING THE OBJECTIVES

Building on a social capital base is an essential requirement of backyard poultry, as it is widely spread across hundreds of households. The Self-Help Groups of women and their Federations provide the right platform for initiating the program in collaboration with the Department of Animal Husbandry. A facilitating agency or program is an essential element for tying-up various loose ends and to create a platform for action.

As part of AP DAI, an analysis of the constraints in backyard poultry and the efforts made in several programs in the state has brought out the following major issues that need to be addressed:

- ✧ High disease incidence, mainly due to the absence of access to vaccination and health care services resulting into depletion of stocks and limitations in reaching to an optimal potential.
- ✧ High incidence of predation of birds by cats, dogs and other wild life; particularly of chicks at an early age.
- ✧ Inadequate night shelters also result in predation, theft and diseases.



- ✧ Non-availability of chicks on a regular basis and in the quantities required to replenish stocks
- ✧ Low levels of supplementary feeding and limited feed availability in the foraging area
- ✧ Low or no marketable surplus generated to give an economic momentum to capitalize on the high price for backyard poultry products
- ✧ Absence of networked/ organized markets to benefit from when there are surplus available

Development initiatives around backyard poultry necessarily have to deal with the above constraints.

### Area Approach

Backyard poultry development initiatives have so far focused on providing 'improved' breeds for free or for heavily subsidized prices. Often, these efforts have not survived more than two or three cycles in a given area, as management issues were not addressed. Considering these experiences, two changes/modifications to the approach are required:

- ✧ Focus on addressing management constraints rather than 'providing improved breed birds'
- ✧ Focus on an 'area approach' where support systems are institutionalized on an areas basis rather than on an 'individual family' based approach.





The area based approach aims at evolving all support systems<sup>3</sup> at a reasonable geographical scale, i.e. at a cluster of villages or Block/Mandal level, with the objective of reaching an optimal level of stocking over a period of time. The institutional mechanisms related to services to be provided by, and linkages to be established with, the Animal Husbandry Department also need to be established at this scale.

### Institutional Partnerships

An area approach and an established institutional partnership with SHGs and their federations are the two key pivots for reaching scale. The social capital available in an area (different types of community based organizations) will provide the basis for effective service delivery, diffusion of knowledge and skills and networking for marketing. Initiating the program at the federation level will provide an institutional scale, reducing transaction costs.

#### *Social Capital base of a MMS...*

In Kosgi, Mahabubnagar, more than 9000 women were organized into 678 SHGs. These SHGs were federated into 30 Village level Organizations (VOs). A Mandal level Federation – Mandal Mahila Samakhya was formed with the representatives from these VOs.

### **Situation Analysis:**

Program developing starts with a situation analysis. Data can be generated quickly using SHG book-writers/facilitators. The following information needs to be known as basis for planning:

- ❖ Present household level stocking rates – i.e. the number of birds (maximum and on an average) per household;
- ❖ What types of local breeds are available and their performance in terms of egg laying capacity and body weight (at 6 months age)
- ❖ Sources of chick supply – what are the sources (like weekly haats) of chick supply if one wants to start afresh, cost of the chicks/ birds- age and breed type; also assess the volumes available
- ❖ Hatching and brooding practices (percentage of hatching and an assessment of how many birds survive early predation, diseases etc., by the age of 6 weeks)
- ❖ Locally available breeds and their performance
- ❖ Prior experiences of introducing new breeds, if any

#### Mortality rates

- o Due to predation; type of predation and
- o Due to communicable diseases – types of diseases
- o Computation of asset losses due to mortality within the area will provide indications of the seriousness of the problem.
- ❖ Access to vaccination and other health care services including ethno-veterinary practices
- ❖ Practices related to night shelter

<sup>3</sup> Mainly of vaccination, health care, establishing sources of chick supply to replenish stocks and building awareness on appropriate management practices





- ❖ Supplementary feeding practices (quantities, type of grains feed material)
- ❖ Market conditions – calendar of festivals which indicates the demand seasonality and the higher prices of eggs and live birds
- ❖ General household incomes of families having low, medium and larger flock sizes.

The involvement of Veterinary Doctors from the Department of Animal Husbandry can be of immense use as they provide technical inputs. The situation analysis can be a simple exercise using participatory methods in a sample of villages within the selected area.

#### ***Sharing the findings of situational analysis:***

The team that has undertaken situational analysis in sample villages can organize a sharing workshop with representatives of SHG federations (village Organizations), and Gram Panchayats. The summary findings can be validated in this workshop and strategic areas for program intervention can be identified.

#### ***Significance of Festivals***

The backyard poultry is culturally embedded into communities. Eating poultry meat is a ritual in some of the festivals. The bird stock in the backyard depletes substantially post-these festivals. Spaced over the yearly calendar these festivals provide an enormous market opportunity that can be incorporated when planning the production cycle.

Also at issue is how quickly the bird stock regains after the festival season? Constant availability of chicks brings the stocking rates to the optimal level quickly.

In Kosgi Mandal, the following strategic areas were identified for intervention after the initial situation analysis;

- ❖ Establishing Chick Rearing Centres (CRCs) as business enterprises.
- ❖ Streamlining vaccination and primary health services
- ❖ Developing strategies to deal with predation, including establishing proper housing facilities
- ❖ Developing a networked marketing system

#### ***Setting the Objectives***

Even before the strategic program interventions are identified, it is important to set an objective to be achieved. Such an objective can be stated as follows:

- ❖ Increasing the stable bird population at household level to best use the potential of the foraging area around the backyard, and
- ❖ Increasing feed availability in the backyard

These are examples of two objectives that can provide direction to a program. Stable bird population is important as backyard poultry has pronounced seasonality with stocks fluctuating substantially as a result of disease outbreaks and demands during festival seasons. How to secure that the stocks regain their optimal level as quickly as possible is the challenge. This can only happen when an array of support systems are institutionalized within the area.





## The Question of Breed?

There are differing perspectives on introduction of new breeds into backyard poultry. These differences were debated in detail during a national level workshop on experience sharing on Backyard Poultry, organized between 9th-10th July 2009<sup>4</sup>. A larger consensus emerged during the workshop that new breeds of poultry birds should not be introduced in areas where a traditional distinct breed is predominant, as these provide a diverse and disease resistant germplasm. For example, no external birds should be introduced into tribal areas where Aseel is predominant.

Though there are different opinions with regard to the promotion of new/ 'improved' birds, the efforts for development of such breeds are there in various parts of the country. The various breeds developed are as follows:

- ❖ Public sector research organizations such as the Project Director Poultry, SV Veterinary University (AICRP centre) have developed breeds such as Vanaraja, Rajashri etc.
- ❖ Development Sector institutions like KVKs and NGOs have developed some breeds such as Divyayan Red (developed by KVK-Ranchi)
- ❖ The private sector has developed breeds like Kroiler

The 'improvements' in the above breeds are in respect of increased egg-laying capacity, obtained by removing the broodiness in the birds and their ability to gain body weights fast. By their very nature, these breeds are less agile and are prone to predation and diseases as they are mainly crosses from completely/ mostly external germplasm. In the AP DAI areas, mortality rates of above 30% are observed when these 'improved' birds are introduced. As these birds do not brood, it was realized that a constant chick supply source need to be established. The fast growing private sector has their own distribution channels<sup>5</sup>, while the Central Poultry Development Organization (CPDO) of Government of India has a mandate to establish chick supply systems. Normally day old chicks are available with these organizations.

While in traditional breed-tracts, only the native birds are to be encouraged, selection of a breed must be a considered choice in other areas after carefully analyzing the pros and cons of introducing a new breed. Where the 'improved' birds are promoted, it is important to ensure a mix of local and improved birds as the latter do not brood. Clarity with regard to the desired end product is essential in making decisions on which breed/breeds to be selected; the objective is to have birds mainly for meat, meat + egg or mainly for egg production, the objective is to satisfy local consumption or for marketing? These are important considerations in the choice of breed.

APDAI program started with the 'improved' birds but later shifted to 'desi' or local birds, particularly in Anantapur district where local birds are well performing (in terms of growth in body weights).

In Mahabubnagar district, several entrepreneurs are establishing Chick Rearing Centers (CRCs) with 'improved' birds.

<sup>4</sup> Please refer Proceedings Report of National Workshop on 'Synthesizing experiences in Promotion of Backyard Poultry, organized in Hyderabad. Report is available in WASSAN's website; [www.wassan.org](http://www.wassan.org)

<sup>5</sup> Please refer SAPPLP studies on this aspect for more details. Visit: <http://sapplp.org/thematicfocus/small-holder-poultry>





## CHAPTER - III

## PROCESS STEPS

Institutionalizing support systems at an Area level is the first important step in developing backyard poultry. At an area level, the program needs to institutionalize;

- ☞ Vaccination services covering the total bird population in a village
- ☞ Systems that reduce mortality and increases availability of chicks
- ☞ Constant supply of chicks
- ☞ Knowledge management, including dissemination of good practices

### Total Village Vaccination

Diseases like RD (Ranikhet Disease) causes large scale mortality and the value of such loss is mostly ignored. Sporadic vaccination drives do not address the issue. Vaccination against RD and Fowlpox are important. Vaccination must be taken up either in the night or in the early morning as it is difficult to catch individual birds during day time.

As these vaccinations require a large scale effort and involves high transaction costs, if taken up by the AH Department on its own, a system of women vaccinators could be operationally simple and cost effective. Women can be trained on poultry vaccination very easily.

Total vaccination campaigns can be planned by the federations of SHGs at village level (Village Organization) and/or Gram Panchayats. Against an indent, the Village Organization / Gram Panchayat gets the required doses of vaccines from the AH Department and organizes household level vaccination through trained women vaccinators.

The women vaccinator may charge Rs. 0.25 to 0.50 per bird for vaccination. However, as it would involve small amounts and high transaction costs for each vaccinator to collect the fees from each chicken owner, the cost is best paid through the Village Organization or the Gram Panchayat at each vaccination event. In order to finance these costs, an endowment fund may be created at Village Organization level, the interest of which can be used for this purpose. The vaccines must be available in doses of 50 to ease the operation and prevent wastage.

#### Vaccination Calendar for Chicks (1- 6th week in CRC)

S. No.	Time	Name of the vaccine
1	5th day	Lasota
2	28th day	Lasota
3	42nd day	R2B (Ranikhet)

#### Vaccination calendar for Back Yard Poultry

Time	Name of the vaccine
December – January & May – June	RD
December - January	Fowl pox





### Precaution in vaccination

- ☞ All the birds of the village or the area should be vaccinated
- ☞ Maintenance of cold chain is important as the vaccines are viral vaccines.
- ☞ Vaccinate the birds in cooler hours, preferably nights or early in the morning.
- ☞ Sterilization of the equipment (Syringes, needles and containers) with hot water is compulsory.
- ☞ Care should be taken to control the birds while vaccination.
- ☞ Do not expose the vaccine vials or diluted vaccines to sun or heat.

### Reducing Mortality of Chicks and Birds

Reducing mortality in backyard poultry contributes substantially to increase the bird population and profitability of the activity.

**Reducing Chick Mortality:** The initial survey of the village will provide insights into the mortality rates of chicks and the reasons therefore. Usually chick mortality is high due to early predation and diseases. Vaccination partly takes care of the communicable diseases problem. Rearing the chick under protection for about 4 to 6 weeks reduces the mortality substantially. An attempt at rearing the newly hatched chicks (below 5 days age) in Chick Rearing Centers in one of the villages in Anantapur under APDAI has given good results.

Scheduled vaccinations can be completed during this period. Raising chicks under confinement also reduces predation related mortality.

**Survival in the Backyard:** Birds survive well in households having people (old/disabled etc) to look after them while they forage in the backyard. Secure night shelter, regular vaccination and access to health care services are important factors in reducing mortality.

### Some observations on Predation

- ❖ Predation is a serious problem in the early age; birds can generally escape predation after 3 months age.
- ❖ Body weights are higher and legs are shorter in the 'improved' birds making them highly prone to predators. The local birds, being more agile, can escape predation easily compared to the 'improved' breeds.
- ❖ There is a need to observe the time of predation. In Mahabubnagar, its incidence is high from 12 P.M. to 4 P.M. Women labor and farmers, kept their birds in-house during that time while going to work to protect birds from predators. Children let them out for foraging after they come back from school.
- ❖ Night time predation is mostly due to improper poultry housing (keeping them under a basket). Night shelter with small and deep opening, is observed to be effective in protecting the birds. This is also helpful in avoiding theft.
- ❖ In some of the cases of 'improved birds' – women carry their birds (two to three) along with them to work.
- ❖ Predation by wild cats is higher in villages with crops around, particularly in Kharif season.
- ❖ Birds reared around the farm-houses and /or around the bore-wells gain body weight quicker as feed availability is higher. This will also help in insect control.





## Backyard Poultry Insurance

Mortality due to disease and predation is a very serious problem threatening the spread and sustainability of the initiatives with 'improved' birds. During the initial phases of AP DAI, an attempt was made to introduce a Community Managed Insurance product for Vanaraja birds, specially targeting predation related mortality. The objective of that exercise was to insure birds so that they can be replaced in case of predation, i.e. the insurance scheme was aimed at asset replacement. This provided security for a household, allowing them to investment in the new birds in spite of the high risk involved. This could also be seen as a loan protection scheme. The modalities evolved were as follows:

- The insurance product was offered by the federation of SHGs at village level (village organization) and for the specific purpose of covering predation related risks.
- The households paid Rs.5 as premium per chick to be covered for a period of 6 months, into an account held by the village level federation (VO).
- Any loss of bird due to predation had to be reported to the federation and entered into an insurance register. A sub-committee from the village organization assessed the claim and made their recommendation on payout.
- If the sub-committee so recommends, the insurer is paid Rs.35 per predated bird.
- As a safeguard against moral hazard, a condition was introduced to the effect that claims would be settled only once in an year and, if the total claim exceeded 10 percent of the total premium receipts, the premium amount collected during the year would be equally distributed among all the claimants.
- If the total claims were below 10% then each claim were paid with Rs.35/-

The process did not succeed for few reasons; a) Lack of capacity of the institution to manage the product and objectively assess the claims b) Limitations of scale c) Inability in ensuring low mortality. At a certain minimum scale, the process could be adopted in initiatives promoting 'improved breeds' as a loan protection scheme. The transaction costs would be lower at certain scale (of about 10,000 birds).





### Supplementary feed

Survival and growth in extensive scavenging system is limited by the availability of feed resources in the foraging area and the quantum of household waste, left over grains (after harvest) etc. Thus, scavenging system works well where there is an abundance of biomass. In areas with poor rainfall, particularly in dry and arid regions, the feed availability will be a limiting factor. Supplementation of feed to chicks results in gains in body weight and improved egg production. The uniqueness of backyard poultry lies in the low, or even no cost incurred on feed. However, in order to increase feed availability (and thereby productivity), increasing the insect population in the foraging areas, raising azolla and green leafy vegetables could be some of the areas for further work. Integrating millets as inter-crops into the farming systems for supplementation of feed to backyard will be a low cost option.

If the birds are procured from chick rearing centers, it is important to provide supplementary feed immediately after the birds are brought to backyard. Supplementary feed is also used to habituate the birds to return to homes after foraging.

### Ensuring Constant Supply of Chicks for backyard poultry

Auto-regeneration is an important characteristic of backyard poultry. However, at times there will be a sudden depletion of stocks due to epidemics or after some festivals, and it may take some time for the stock in an area to replenish. Regular availability of chicks is important to increase the stocks quickly and for allowing the freshers to start off.

Chick Rearing Centers assume significance in this regard. These can be developed as business enterprises over 3 to 4 cycles. This could be an essential support system for backyard poultry in an area supplying quality chicks of about 6 weeks age. Many of the backyard poultry promotional programs did not sustain as they depended on one time distribution of pullets without ensuring a mechanism of constant supply of chicks.

The Central Poultry Development Organizations (CPDOs) are established in Bangalore, Chandigarh and Bhuvaneshwar, by the Government of India with a mandate of supply of chicks of improved birds.

AP DAI experience clearly brings out that this task is best promoted by decentralized, small business enterprises of poor women. It enhances sustainability as chicks will be available locally. The process manual synthesizes these experiences. Above all, it opens of the choice of breed to the local people.





## Promoting Chick Rearing Centers as Business Enterprises

These are also called mother units or nurseries. The CRCs become (eventually) small business units rearing about two-day old chicks upto six weeks and selling them on the local market or to households around. The chicks are sourced from a hatchery (mostly in case of 'improved' birds). In case of desi chicks – chicks of age below 10 days are procured from households around and grown upto 4 to 6 weeks age before selling. The process of promoting such small business enterprises is elaborated here drawing from the experience of AP DAI.

### **Who runs the Center?**

This enterprise is appropriate for middle or late aged single women who are unable to go for casual labor employment. Village based poor woman with experience in rearing backyard poultry and with some entrepreneurial skills will be ideal for the purpose.

### **Who Promotes?**

Promoting the enterprise by the Federation of SHGs at the cluster of villages or at Mandal level will increase the marketing opportunities, as these groups provide a base. It will also help the entrepreneur getting the necessary loans for the enterprise.

## Equipment for CRC

In APDAI, MMS has purchase the necessary infrastructures – brooders, feederers, and waterers based on number of chicks to be reared; (brooder-1: 250, waterers and feeders -1:25). Once purchased the infrastructure can be used at least for five cycles, if they use it with care, it can go up to ten cycles. MMS provides equipment to CRCs on rental basis, rent is fixed per cycle basis. These should be arranged properly before a CRC is grounded

### **Process of Establishment of CRC**

The CRC needs two to three cycles to settle as a business enterprise running on its own. Much learning time is required for the entrepreneur to gain confidence and skills, and for establishing a market for chicks from CRC. Initially, the necessary infrastructure can be purchased under a capital grant and it is owned by the Village Organization.

### **Capital for CRC**

Each CRC requires a working capital in relation to the bird population. There is also capital requirement for infrastructure, depending on the unit size. It is important to estimate the budget required and the costs involved in the business with close involvement of the entrepreneur. The cost elements in CRC are: cost of chicks, feed costs, hiring cost of equipment, electricity, rent, cost of vaccines and medicines, miscellaneous items like bulbs, straw etc., and living wages to the rearer.





There are 40+ cycles of CRCs promoted under various programs by WASSAN. And two types of risks are prominently emerging from these experiences; market risk i.e. inability to sell the 6 weeks birds, and production risk related to mortality. The market risk may also arise from the cost of production per bird. When the production cost increased due to higher mortality, there are instances in APDAI where Village Organization has provided subsidy of Rs.5 per chick marketed that prevented losses to the rearer. As a strategy, the Village Organization must cover the risk for the first two cycles. Feed costs constitute the bulk of the working capital and using feed efficiently and minimizing the mortality are skills that the rearer has to get by experience.

The rearer is to be given a loan to cover the working capital, by the Village Organization through the SHG in which she is a member. For this, the SHG signs a loan agreement with the rearer. The loan may be given at a cheaper rate of interest. Before giving the loan to a member, the CRC housing facilities need to be verified by the respective SHG.

### ***CRC Housing***

The CRC entrepreneur identifies a vacant house with proper ventilation for taking up chick rearing, on rental basis or owned house. The house must be protected from

entry of predators like snakes, mice etc. It must have access to drinking water nearby; have adequate floor space (ideally one square feet per bird), electricity connection, doors and windows. It should not be distant from the residence of the rearer. In case of CRC with local birds, the center may be divided into two or three parts, as the same age chicks would not be available at the same time in large numbers. In such CRCs, different age group of chicks needs to be put in different partitions. For example, in a three partitioned CRC, 3-10 days old chicks could be put in chick guards, 11-22 days in one partition and 23-42 days chicks in another partition. The centre has to be cleaned once in two months with the formaldehyde and also it should be sprayed on walls. It must be kept vacant for two days after cleaning. It will help in killing the germs of previous cycles.

*Orientation to the CRC- entrepreneur-* a detailed training and an exposure visit to an existing CRC is a requirement before the loan is disbursed. The entrepreneur must understand the economics of the enterprise and the key variables such as mortality and feed efficiency.





The decision on the number of chicks to be reared is a function of the space available in the CRC-house and estimated market demand. The entrepreneur will decide the number of chicks to be reared depending on the area of CRC, capacity and local demand. It may vary from 200-500 chicks; CRCs with 500 chicks capacity are found to be more remunerative.

## Sourcing the Chicks

### *Rearing Desi Chicks in the CRC*

Chicks are normally not available for sale in the villages in bulk. In Anantapur district under APDAI, the Village Organization worked out a share-cropping arrangement with other households for sourcing the chicks. The rearer collects 3 to 10 days old chicks from the household with an agreement that she will return 50% of the (grown up) collected chicks at an age of 6 weeks. The terms of this share-cropping are:

- ⊗ Collecting 2-10 days old chicks from households without any disease symptoms.
- ⊗ Rearing these in an intensive system (ensuring vaccination and feed), in the CRC

#### **Candling**

Candling is a process to identify the fertile and non fertile eggs and also to assess the number of chicks. While hatching the eggs in the incubator under the hen, the development of embryo starts in fertile eggs. In the process of hatching, unfertile eggs will get spoiled and blood spots are developed on the albumin after 4th day. Such eggs can be separated and used for the purpose of human consumption as there are no biological changes in the eggs, either in the taste, or in appearance.

Candling is done by exposing each egg to light coming through a small slit. A bulb of sixty candles is kept in a small box and light is allowed through a small slit on it. The eggs are kept on it straight; the broader portion should be on the slit. Unfertile eggs will be seen as clearly opaque; blood vessels are seen in the egg through its shell. As embryo is not developed till that time such eggs can be consumed.

- ⊗ If birds are not taken away by the share-croppers from CRC on specified date, an additional Rs.2 per day will be charged to cover the feed cost.

There are approaches where eggs of desi birds like Aseel are sourced from places where the breed is not contaminated and thereafter hatched locally. The desi CRCs are also of immense use in brooding these chicks. There are several interesting observations related to the desi CRC, some of them need to be confirmed over repeat observations. The observations include;

#### **1. Number of egg laying clutches increased**

- a) Through breaking broodiness – In general practice desi hens lays eggs in three clutches with three months interval, i.e. four clutches in a year. Introduction of CRC has broken the broodiness (separating the chicks from mother). Once the broodiness is broken, hens started laying eggs within 25 - 30 days of interval. Thus the number of clutches potentially went up to eight or nine in a year. Normally, a hen lays 12-15 eggs per clutch, thus it gives 48- 60 eggs in four clutches in a year. This went upto 84-105 eggs in nine clutches in a year, after CRC introduction.





- b) By not allowing to hatch - Women who have supplied chicks to the desi CRC observed that if the hen is not allowed to hatch, it starts laying eggs within a week. Thus the number of egg laying clutches could be increased. But this has another dimension. Another farmer cautioned that if the egg production increases per clutch, the size of egg will reduce unless supplementary feeding is provided.

### **2. More body weight in CRC**

Average body weight of chicks in CRC at the age of 6 weeks is far higher at 220gm per bird, than in birds of same age in the scavenging system (60gm).

### **3. Reduced mortality**

In general, 30-40 per cent mortality is observed in the chicks due to predation and diseases. Mortality has substantially reduced in CRC (7%) as birds are in confined situation and vaccination was done as per schedule.

#### **Sourcing Chicks of 'improved' breeds for CRC**

A demand assessment can be made at the Mandal level by the Mandal Mahila Samakhya-MMS involving all Village Organizations. The demand is aggregated at MMS level and a bulk-order is placed with the suppliers of chicks. In APDAI, chicks were supplied by the Project Director Poultry (Vanaraja birds) and SV Veterinary University- ACRIP center (Rajashri birds) against payment. These institutions supply day old chicks after initial vaccination at the research farm.

### **Learning from managing CRC for Desi birds**

- ☞ Getting required desi chicks at a time is not possible, as chicks are available in staggered manner in villages. CRC therefore must operate continuously round the year.
- ☞ Presently vaccines and medicines are available in large packs, ideal for 500 chicks. With less number of birds, it results into wastage in backyard poultry. This wastage can be minimized if vaccines are available and accessible in small doses.
- ☞ The share cropping ratio of 50:50 is not economical; it should be changed as 40:60 i.e. 40% of the chicks given to CRC will be returned to the farmer while the entrepreneur retains 60%.
- ☞ Rearing the birds up to eighth week is expensive; it should be reared up to 6th week, by the time it gains a body weight of 300-350gms.
- ☞ Drawing vaccination schedule based on local diseases along with the local veterinarian is important.
- ☞ At the time of purchase, entrepreneur has to examine chicks carefully and take the healthy ones only.
- ☞ Vaccination need to be checked and assured for the chicks that comes from villages to prevent the spread of the diseases.

Jayamma is a native of Gorlavandlapally village in Anantapur district. She collected 112 chicks from different households on share cropping basis. Those birds were of 3-10 days age. She also purchased 17 chicks at the rate of Rs.10 per each. As per the arrangement, she has to give back 50% of the chicks to households who have given her chicks and 50% will be retained by her. She reared the chicks separately, based on the age, in different cubicles. In that cycle, seven chicks died due to different factors. After rearing the chicks for 8 weeks, the 10 days old chicks gained an average weight of 500 gm and 3 days old chicks reached an average body weight of 350 gms. As per the commitment, she distributed 50% of the chicks to households and got another 210 chicks to CRC; This CRC is catering to 4 villages and now she plans to expand the capacity of CRC.





### **Transportation of the Chicks**

For 'improved' birds sourced from distant agencies, appropriate transport is required. Day old chicks from the hatchery are packed (without congestion) after initial vaccination in special boxes with proper aeration to be carefully transported to the CRC. To prevent dehydration in transport, place some watermelon fruit pieces in the boxes. Chicks should reach the CRCs within 8 hours. The day old chicks can survive almost for 24 hours without feed. It is best to transport the chicks early in the morning. Before the chicks arrive at the CRC housing, a standard re-check on the suitability of housing and other precautions need to be made; adequacy of infrastructure (feederers and waterers) and safety of the house must be ensured.

### **Feed & Management**

Feed constitutes 70% of cost of production. In order to secure good growth, the nutrient balance in the feed is important. Feed can be purchased in open markets or prepared locally. If there are more than one CRC in the Mandal, the MMS can procure feed in bulk and sell to CRCs. One bird needs about 1100 gms feed up to six weeks of age; required quantity of feed should reach CRC before arrival of the chicks. Care must be taken in the storage of feed as there is a danger of

contamination. For supplementary feed, several local options could be tried out. Much of the profits depend on the feed efficiency, preventing wastage of feed and in securing a low mortality rate. To minimize wastage of feed, there must be an adequate number of feederers i.e. one per 25 birds and they must be filled thrice a day.

### ***Providing the vaccination services***

In order to reduce mortality, vaccination must be provided as per schedule. A regular weekly visit of a trained animal health worker to the CRC is crucial. S/he collects information and provides on-site advice. In case of any serious problems a visit by a qualified veterinarian should be planned. Vaccines can be accessed from the local veterinary dispensary or purchased from open market. Cold chain maintenance and storage is very crucial for RD and Fowl Pox vaccines. In AP DAI, women vaccinators were trained and paid for vaccination of birds in the CRCs.

### ***Growth monitoring***

Feed efficiency and low mortality are two critical parameters that define profitability of the CRC. It is important that the entrepreneur understands ratios and their economics, in terms of feed consumed and gain in body weight. Weekly feed consumption is to be recorded by aggregating the daily feed consumption data. In order to compute the average body weight for the week, the weight





of 5 to 10% of the birds, selected randomly is computed. Comparison over the previous week gives the incremental body weights for the week. The ratio of incremental body weight achieved during the week compared to feed consumed during the week gives an indicator of feed efficiency; the higher this ratio, the higher is the efficiency. The same data/ratios plotted on a graph provide a useful insight into the feed efficiency.

### Releasing to Backyard

The transition of the birds from CRC into the backyard must be handled carefully. Releasing the birds for foraging outside the CRC (during the later stage) is useful for acclimatization of birds from controlled feeding to foraging. In the backyard, many households faced the problem of inability of the 'improved birds' to come back to their respective shelters after foraging. Feed supplementation during initial days in the backyard is important to manage the transition and also to get the birds used to the shelter.

#### Records/Data to be maintained

- ✳ List of members who have given chicks to CRC and details in the case of Desi-CRC
- ✳ Daily feed consumption
- ✳ Daily mortality
- ✳ Vaccination, medication plan and action details
- ✳ Weekly weights record
- ✳ Cash book
- ✳ Record of visits/suggestions

### Price fixation and marketing

The chicks can be sold at an age between 4 to 6 weeks (ideally 6 weeks); depending on the body weight and the expected price. Feed cost per day per bird will be high if sales are delayed. Selling at the right time is most critical for profitability. The price can initially be set in relation to the cost of rearing each bird. The cost per bird can be arrived at by aggregating all costs (costs of chick rearing + interest on capital + rental value of equipment etc) and by dividing this figure with the number of birds survived. The following table provides an illustration of arriving at cost structure and pricing of the birds.

#### Example of cost structure and pricing of poultry from CRC – Mungimalla

S.No.	Particular cost Items	Rs.
1.	Total number of chicks	430
2.	Chick mortality	9%
3.	Number of chicks survived at 6th week	391
4.	Total cost of the chicks	4843
5.	Total cost of the feed	5476
6.	Infrastructure hire charges (rental value)	498
7.	Total cost of the paddy husk	281
8.	CRC rental charges	300
9.	Total medicines cost	344
10.	Other expenses	392
11.	Total expenditure up to 6th week	12134
12.	Expenditure on one bird up to 6th week	31.43
13.	Total loan amount	12129
14.	Interest @ 6%	90
15.	Loan to be repaid	12220
16.	Price of the bird	40
17.	Gross Income	15664
18.	Net profit	3444
19.	Net profit per bird	8.80
20.	Wage per day for 4 to 5 hours work for 45 days	76.52





In Mungimalla, the entrepreneur earned a total of Rs.3444/- for her effort of nearly 45 days. This amounts to a wage earning of Rs.77 per day; if the infrastructure hire cost is not considered, the net profit would be around Rs.4000/-. Reduction in mortality rate would have further increased the net profit.

### ***Selling the birds to back yard***

In case of desi CRC, marketing of the chicks is not difficult if the body weights are good; there would be a claim on the birds by share-croppers. It is relatively difficult to sell the improved birds, particularly in the initial periods when there is no local experience with the new birds. But, over time (after egg laying) as the experience builds up in the backyard, the demand starts increasing.

It is very important that the birds are sold before the end of the 6th week, the production cost of the bird will increase at least by Rs.1 per day per bird thereafter. The profit margins drastically reduce if the birds could are not sold before the 6th week.

### ***Total Village Level Vaccination of Poultry***

Institutionalizing disease surveillance and village level total vaccination of all birds using women vaccinators is of utmost importance. The necessary costs related to vaccination campaigns in the area of concern must be taken up by the Department of Animal Husbandry.

### ***Intensifying feed in backyard poultry***

Backyard poultry survives on foraging and very little supplementation. The feed (grain, insects and vegetation) can be intensified in the backyard. Culturing termite moulds in earthen pots, farm-yard manure/organic matter heaps with high insect population, sowing leafy vegetables are some of the practices that have potential to increase feed availability. Integrating cultivation of millet crops into the crop-systems (as intercrops or border crops) are other options.

### **Strategies to Promote Backyard Poultry in Public Funded Programs**

Several development programs supply 6 weeks birds free or at subsidized rate. Many of these efforts did not see a second cycle! Instead, CRCs can be supported as part of development efforts. Over several cycles of these efforts, it is observed that subsidizing about 25% of the cost per bird at the point of sale from CRC is the best measure of providing public subsidy to backyard poultry; and this should be on a continuous basis for five years; this is in addition to the initial one time investment in infrastructure, revolving fund, poultry housing etc. This will make these birds attractive. Over this period the CRC will be properly established as an enterprise operated by the poor. Provision of a shed for CRC and infrastructure will substantially increase the profitability and wages earned.





### Three approaches were tried in AP DAI to reach out to households viz.

#### **Direct sales by CRCs to households and/or in local weekly markets :**

Initially, owing to poor local demand, direct sales by the rearer have become difficult at the price set. Culled birds from commercial poultry sold by traders in the local shandies at much cheaper prices (almost half the price) have set stern competition. There will always be an initial commotion among the households owing to higher mortality rates due to predation and diseases. It will take at least one and half to two years for the new breeds to settle down and establish a constant market. Eventually direct sales by CRC would provide economic stability and a rhythm to the backyard poultry.

#### **Promoting it through loans provided by SHGs :**

In the SHGs loan route, collecting the indents from SHGs, aggregating and placing the indent to CRCs, requires facilitation at federation level. It should be completed a week before the actual sales start. It was observed during the initial cycles that the poorer households are being left out as they have no resources to make initial investments. Several of the poorer households are either not in SHGs or in SHGs that are dysfunctional or they have over-dues to be repaid. As such factors inhibit the backyard poultry, an idea of share-cropping was tried to reach these households.

#### **Share cropping by the Federations:**

The federation of SHGs purchases the birds from CRC and enters into an agreement with individual household (particularly focusing on aged women) for rearing. The terms are that 50% of the birds will be repaid in kind to the federation after eight months of rearing. Thus, the household can retain 50% of the birds while the federation can realize their investment by selling mature birds (after 6 months) either for egg laying or in the meat market. This has been grounded well in some villages but failed in some. However, the experience shows that the institutional strength of the community based organization is a key factor for its success i.e. their ability to ensure repayment in kind or in cash. The risk can also be shared by both parties in the share cropping system.

The entrepreneur has to pay the principle and interest of the loan to VO as per agreement after completing sales, after the first cycle. The repaid amount is used again as start-up capital for the next cycle. The income levels (net profit) from the CRCs are mainly a function of the number of birds reared, feed cost and mortality. Depending on the number of birds reared, the net profits ranged from Rs.1040/- to Rs.5612/- per one and half months; it comes to a wage rate ranging from Rs.23/- to 125/- per day.





The 'bottom line' in economical terms is that one cycle of rearing of about 400 to 500 chicks by a poor women (single women/women headed household) means:

- ❑ An earning equivalent to one to one and half acre of dry land!
- ❑ A wage earning equivalent to 45 days of employment at an average wage rate of Rs.76 per day, requiring about five hours of work each day.
- ❑ If three such cycles are taken up in a year on a regular basis, the annual income will be in the range of 10,000 to 15,000 rupees!

### **Initiatives in scaling up**

Drawing from the experiences of backyard poultry under APDAI, the District Water Development Agency (DWMA) has integrated backyard poultry into the watershed development programs in the district of Mahabubnagar. 38 CRCs have been set up and gone through one or two cycles. Backyard poultry has also been introduced into the IGWDP/ WDF watershed development programs of NABARD. A total of 115 cycles have been completed, rearing approximately 51,000 chicks for supply to the backyard in a span of one and half years.

The same process steps were followed in the scaling up. The CRC entrepreneurs and field facilitators from APDAI served as trainers and resource persons to aid this scaling up effort. These examples of scaling up show the potential for integrating backyard poultry into watershed development and other livelihood enhancement programs.





Backyard poultry has high potential for sectoral contribution to livestock economy and also development potential for increasing income of the poor through:

- + Providing enterprise opportunities to poor and aged women through CRCs
- + Generation of widespread household incomes ranging from Rs.1000 to 2500 per household, in addition to providing necessary protein supplementation.
- + Meeting part demand for eggs and poultry meat at national level using foraging areas and without any dedicated allocation of land and water resources.

***The critical processes for promotion of Backyard Poultry are:***

- + **Follow an area approach** - establish vaccination services and health care systems and chick rearing centers in a cluster of village or even at a larger scale of a Mandal/ Block.
- + Shift from distribution of birds to establish support systems and spread knowledge on management.

Make investments on the following:

- o Training large number of women vaccinators
- o Supporting total vaccination of all poultry birds in the area selected (with women vaccinators).
- o Supporting establishment of Chick Rearing Centers – This can be done by providing for infrastructure investment for a cluster of villages and establish revolving fund for the enterprises. These can be established as custom hiring centers of Chick Rearing Centers.
- o Subsidizing 25% of the working capital of Chick Rearing Centers operated by poor women in the form of a price incentive, i.e. the price at sale of bird could be reduced by 25%.
- o Extending financial support for the poor households, for night shelters
- o Supporting further research in improving feed availability in the foraging areas of backyards and developing low-cost feed from uncultivated sources.
- o Providing for facilitation cost at a reasonable scale for at least three years.





### Role of Different Institutions in Backyard Poultry (Actor-Role Matrix)

S.No.	Actor / Institution	Role
1.	Individual households	<ul style="list-style-type: none"> <li>• Buyers of chicks from chick rearing centers</li> <li>• Suppliers of early age chicks to Chick Rearing centers</li> <li>• Rearers of backyard poultry</li> <li>• Supplier to markets</li> </ul>
2.	SHGs	<ul style="list-style-type: none"> <li>• Generating indents for vaccines</li> <li>• Placing indent for birds</li> </ul>
3.	Federations of SHGs at Village (Village Organization)	<ul style="list-style-type: none"> <li>• Disease surveillance</li> <li>• Operating a community managed insurance product</li> <li>• Linking the rearers to various institutions</li> </ul>
4.	Federation of SHGs at Mandal Level (Mandal Mahila Samakhya-MMS)	<ul style="list-style-type: none"> <li>• Provides equipment (brooder, feeder etc.) on rental basis</li> <li>• Provides working capital as loan through SHGs (provides material inputs i.e. chicks and feed and rental charges)</li> <li>• Provides linkages with the chick supplier (PDP / SVVU) and Dept of Animal Husbandry for vaccines</li> <li>• Undertakes vaccination and health care services</li> <li>• Aggregates the demand for chicks from several CRCs and places a bulk-order with the suppliers ((PDP / SVVU/ AICRP)</li> <li>• Liaison with the Department of Animal Husbandry</li> </ul>
5.	Vaccinators / Animal Health Workers	<ul style="list-style-type: none"> <li>• Vaccinating the birds against service charges</li> <li>• Reporting on diseases</li> <li>• Spreading awareness</li> </ul>
6.	Traditional chick suppliers	Sells culled birds from commercial poultry into village markets
7.	Vet- medical shop keepers	Sells poultry medicine and vaccines
8.	Gram Panchayats	Ensures total village level vaccination of poultry birds
9.	Chick suppliers (Research Institutions )	<ul style="list-style-type: none"> <li>• Supply of vaccinated day old chick to entrepreneurs</li> <li>• Assessment of performance</li> </ul>
10.	Department of Animal Husbandry	<ul style="list-style-type: none"> <li>• Provides technical training programs</li> <li>• Provides the vaccines as per schedule</li> <li>• Extends technical back stopping at field</li> <li>• Linkages with other government programs related to BYP and works collaboratively with CBOs.</li> </ul>



# STRENGTHENING THE BACKYARD POULTRY

