



# Producing eggs in a solar poultry farm in Tajikistan

Advice for farmers



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Christine Oriol

The present edition is inspired by the handbook of Christophe Viltard developed by GERES in the Indian Himalayas in 2009.

Design  
Farida Yunusova

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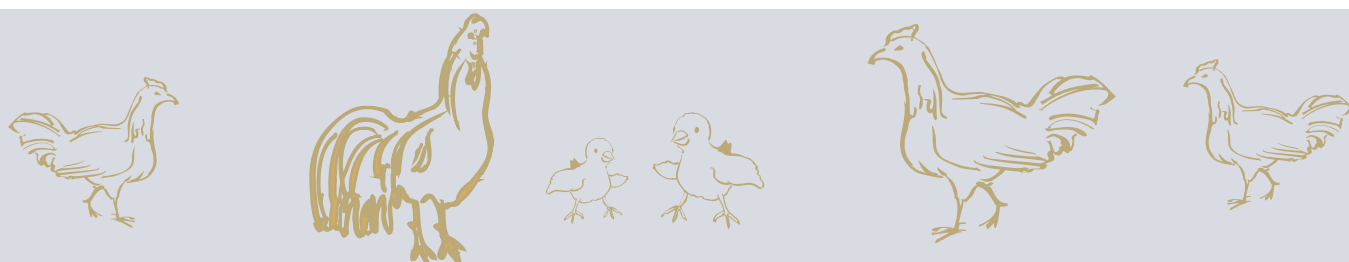
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## FOREWORD

In 2011, ASDP Nau and GERES launched a project to help small-scale farmers increase their agricultural income in Sughd province, Tajikistan: the target areas of the project were in Fon Dario jamoat (Ayni district) and in Oshoba jamoat (Asht district). The project ended in 2013 and has supported 70 farmers in improving the productivity of their poultry production.



This brochure gives guidelines on how to make the best use of the solar poultry farm, how to improve feeding and hygiene of the hens, and how to plan a poultry business. The overall aim is to give tools to farmers that can help them sustain their businesses.

The advice provided in this publication is based on the principles of sustainable agriculture. The aim of sustainable agriculture is to provide good quality food for people while ensuring the long-term use of natural resources (soil, water, air).



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# Sheet 1

## STARTING YOUR POULTRY BUSINESS: MAKING THE FIRST DECISIONS

### 1. Business project: chicken for meat or chicken for eggs?

Chickens used for meat production are special breeds that grow much bigger and much quicker than other breeds.

They can be slaughtered at 10 weeks on an optimal economic point of view, but the meat quality will be much better when the birds are older (4 to 5 months).

Chickens used for eggs have a natural cycle: they lay eggs nearly every day during a period (10 to 20 days) then they stop for hatching.

Improved breeds have been selected to reduce the hatching behavior and increase the laying period. During winter the egg production is much lower than in summer. Hens start to lay eggs when they are between 4 and 5 months old. The maximum production is at 1 year old. Then it decreases slowly. At 5 year old it becomes much lower. Good layers can produce about 200 eggs per year.

Cocks are not necessary for egg production. To produce fertile eggs that will give new chicks, the ratio should be 1 cock for 10 hens.

Some other breeds are adapted to mixed production (eggs and meat) but their productivity in both types of production is lower. Local breeds for example are much less productive but are also much stronger, easier to rear, and more adapted to the local conditions.

Look at the demand and at the price of poultry products at the bazaars next to your place. What is easier to sell: eggs or chicken meat? What is the most profitable?

### 2. Buying the chicken

#### a/ Choosing the variety

You need to ask the supplier the following characteristics:

- Color of the eggs (white, light red),
- Color of the chicken,
- weight of the chicken once they are adult, and feeding needs,
- age when you will buy them.

You should be aware of which breeds are available to be bought in your area.

In Sughd, these special breeds are available:



LOMAN  
CINDY



LOMAN  
LCL CLASSIC



LOMAN  
BROWN LIGHT





For example, for the Loman breed, the following norms are to be expected:

Breed	Loman Cindy	Loman LCL Classic	Loman Brown Light
Weight at 20 weeks	1460g	1386g	1640g
Feeding ratio per day at 20 weeks	88g	89g	93g

Then you are able to choose whether you prefer a big hen, a smaller one, or one with big feeding requirements...

#### b/ Finding a supplier

- find a supplier who is trustful and who will give you chicks that are hens, not roosters.
- determine at what age you want to buy your chicks. When they are young, they require special treatment. It is easier to buy hens that are already almost adults and can produce eggs quickly.
- plan to have some money to pay for the transportation of chicks to your farm.

In Tajikistan, if you want to buy chicks that are different from the local varieties, you can ask the big poultry factories to supply you.

City	Name of poultry farm	Contact person	Phone number	Variety of chicken
Istaravshan	Poultry farm Simurg	Nurali Sheroliev	92 709 43 53	Loman Braun, Loman Klassik
Vaxdat	Poultry farm Navruzi	Ravshanov Ismoil	917041677	NA

#### c/ Buying the chicken

- Determine what the best time to buy your chicken is: in the summer time it might be too hot, in the winter time, the transportation might be difficult,
- Count how much money you need to buy and transport the chickens,
- Plan how long you will keep the chickens before buying new ones,
- Plan the number of chickens you want to buy,
- Look at your cash availability: if you don't have the necessary cash now, can you borrow some money (bank, relatives, neighbors)?

## Sheet 2

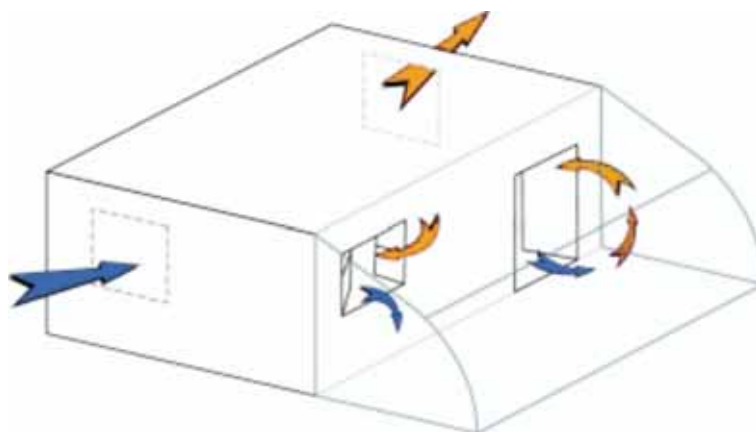
### USING THE BUILDING TO PROVIDE A SUITABLE ENVIRONMENT FOR HENS

A poultry farm is designed to provide the hens favorable conditions to improve production in winter time.

The walls as well as the roof are insulated to retain the heat inside while the south face gains heat by an attached greenhouse. The floor is composed by a cement slab, which is easy to wash.

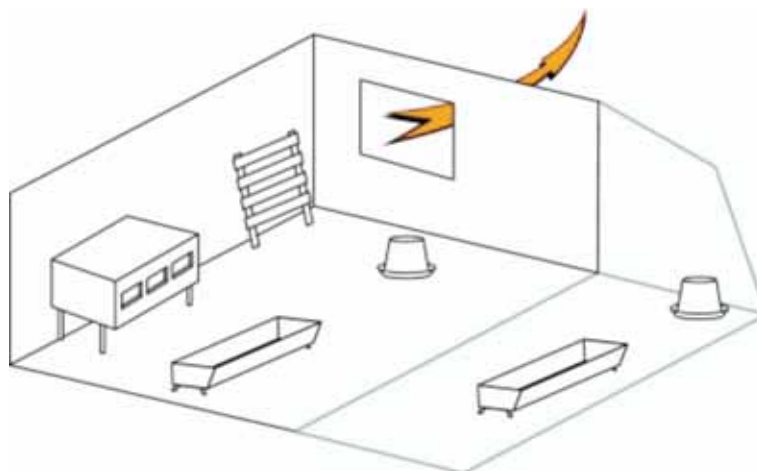
During sunny days, the sun will heat the air in the attached greenhouse.

The farmer will open the door and windows of the inner wall so that the hot air of the greenhouse warms the shed for the night. When the shed is warm, the farmer will close the inner door and windows to trap the heat inside the shed for the night.



The poultry farm needs to be ventilated during the day to avoid overheating and to exhaust the gases emitted by the birds.

For efficient ventilation, windows on each side of the greenhouse should be opened.







# Sheet 3

## TEMPERATURE AND LIGHT FOR HENS

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### Temperature

When the temperature is too cold, below 15°C, the hens spend a lot of energy to maintain their own body temperature and the egg production decreases and can even stop.

A well maintained and clean solar poultry farm should ensure a suitable environment for adult birds.

When the temperature rises over 20°C, the poultry shed should be cooled by ventilation and opening the door.

In case of high temperatures, water should always be available. As they don't sweat, chickens need to drink water to cool themselves.

The best way to find out what is most comfortable for the birds is to let them be free to choose where to stay: in an outdoor fenced park outside, in the attached greenhouse, or inside the shed.

### Light

The light regime is also very important. Food ingestion depends on light: birds eat more food when there is light.

Light rhythm has also an effect on egg production: the production is higher when days are long (in spring).

- Give food outside or in the attached greenhouse when possible
- look at the density of your hens : 4 to 5 birds per square meter is the maximum if you want to produce eggs

# Sheet 4

## EQUIPMENT FOR THE SOLAR POULTRY FARM

Chickens like to perch for the night.

Perches should be placed up to 1 meter above the floor level.

Count 30 cm in length per bird. The distance between them should be 30 to 40 cm

Ideal perch width is 4 cm, flat on top, with softened angles.

1 laying box for 5 laying hens:

- Laying boxes should be placed at about 60 cm above the floor,
- The inside should be covered with soft material as straw, sawdust or sand,
- Box should be cubic (40 x 40 x 40 cm), with an opening about 10 cm from bottom (25 cm x 30 cm),
- Boxes should be clean and disinfected.



It is recommended to close the boxes at night so that hens don't sleep inside them and make them dirty.



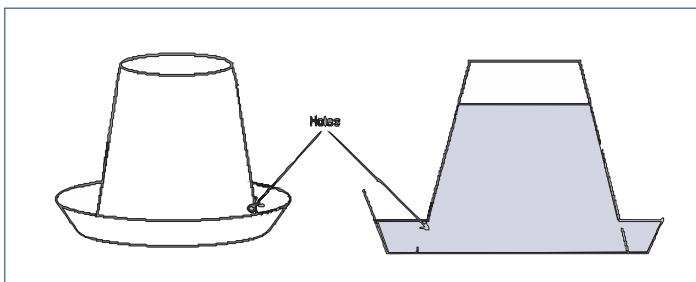
# Sheet 5

## FEEDING EQUIPMENT

### Providing water

Water shortage can lead to very quick mortality.

Water must be always available during the day for all chickens, regardless their number. Adapt the number of drinking points according to the number of chickens you have.



- Give clean drinkable water,
- Change water and clean trough with detergent every day,
- Plastic buckets with holes in the edge and plates can be used,
- Count one bucket of 3 liters for 20 birds.

### Providing food

The feeders should prevent food wastage and remain clean. They are therefore placed out of reach of the birds' feet.

For 20 birds, count one feeder 1 meter long, 10 cm high and 3 cm wide.

- A system should be installed to prevent birds from climbing on feeder (for example: a rolling tube over it).
- Food and water should be distributed every day at the same hour.



# Sheet 6

## MAINTENANCE

Maintenance of the poultry farm is one of the main keys to success.

At least every month the litter must be changed. The litter can be made of a 5 to 10 cm thick layer of saw dust or straw. It should always remain dry and clean.

The litter absorbs the chicken drops and helps to maintain the birds' cleanliness and therefore all components (feeders, water troughs, laying boxes). If the litter is changed regularly it becomes easier to clean and disinfect the poultry shed and its components.

Eggs should be collected twice a day: at 12 AM and at 4 PM. The laying period is generally from 10 AM to 2 PM. Collecting them at this time reduces the risk of broken eggs.



BIRDS IN GOOD CONDITIONS



BIRDS IN BAD CONDITIONS

Daily observation is part of maintaining the hen house. The bird's behavior and appearance give lots of information about the state of their health and the suitability of the hen house. Signs of a sick hen include immobility, aggressive behaviour, feather losses, and broken eggs.

The farmer should also look for traces of diseases in excrement (abnormal color, presence of blood, diarrhea...).

Observation capacity and interpretation are part of the farmer's skills and come with experience.

- Clean the feeders and drinking trough with detergent every day,
- Change the litter and disinfect all accessories at least once a month,
- Observe your animals every day,
- Collect eggs twice a day.

# Sheet 7

## CHICKENS' DIET

Chickens are omnivorous animals. Their food should be balanced and composed of different ingredients.

To provide a balanced diet for his birds the farmer can either buy ready-made feed such as kombikorm, or make a diet composed of local products.

The farmer should make sure that the birds receive the right amount of glucides, lipids, proteins, minerals, and vitamins:

- Cereals (wheat, maize, barley, oat) for glucides and proteins, should be the major part of the diet (about 60%).
- Legumes seeds or derived (soya) should be added to improve protein level, but should not reach more than 20% because many of them contain toxic elements,
- A low fiber protein source (5 to 10%) is often necessary (meat, blood, fish, dairy products),
- Vegetables and germinated seeds (cereal, lentils) can provide lots of vitamins,
- A mineral complement is also necessary especially calcium for layers: bones (burned & smashed), egg shells.

Local food mix can be constituted as follow:

Type of food	% of the total mix
Grounded maize	29
Grounded wheat	25
Soy oilcake	10
Wheat bran	10
Chickpea or mung bean	5
Carrot	6
Chalk	3
Ground bones	1
Blood of cow	5
Fresh grass (alfafa)	6

To ease the chickens' digestion these ingredients should be flattened or roughly ground with a grinder.

A few recommendations:

- Do not change food composition too suddenly and too often,
- For adult birds daily food requirements are about 120g per bird, but this amount should be adjusted to conditions and bird's appetite,
- Provide small pieces of gravel (1 or 2 mm) to help chicken's digestion.



# Sheet 8

## MAKING YOUR BUSINESS PLAN

### 1/ Feeding the chickens: make your own calculations

#### **a. Feed composition: calculate the cost difference between ready-made feed or home-made mix**

1/ Kombikorm cost= TJS/ kg Where to buy:

Transportation cost=

2/ Home made mix with feed from the bazaar:

Calculate according to the table in sheet 6 how much would the feed composition cost:

#### **b. Cost of the feed for one year for all poultry:**

Number of chickens:		
Ration for one day for one chicken	0,12	Kg/day
Kg for one day for all chicken	= number of chicken x 0,12=	Kg/day
Total cost of feed	=kg for one day for all chicken x price for one kg of home-made feed x 360=	Somoni/year

### 2/ Evaluate the costs of equipment for the chicken farm:

Cost for building or buying perches, boxes, sawdust, water and feed distributors		Somonis/ year
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### 3/ Evaluate the costs of running the poultry farm

Pay attention to the fact that good quality veterinary services are essential to the good running of your poultry farm.

Medicine costs/year (vaccines, veterinary)		Somonis/ year
Vitamins and mineral (/year)		Somonis/ year
Salary for helper if needed		Somonis/ year
Water		Somonis/ year
Electricity for inside light		Somonis/ year
Building maintenance		Somonis/ year
TOTAL COSTS		Somonis/ year

### 4/ Earning money with your chickens

#### **a. Take into consideration the loss of chickens**

Mortality		number/month
Alive chicken/hens left after one year		number



### b. Income from meat

Chickens killed for meat per year		number
Price of meat		TJS/KG
Kg of meat/chicken		KG
Income from meat selling		Somonis/year

### c. Income from eggs

Total number of hens		number
Average number of eggs per month		Nb/month
Selling price of one egg		TJS
Income from egg selling per month		Somonis/month
Income from egg selling per year		Somonis/ year

### d. Where do you plan to market your products?

Where can you sell your meat or eggs?		-
Cost of transportation for selling		somonis/month
Total marketing cost		Somoni/year

## 5/ Calculate your profitability

### COSTS

Buying chickens		TJS/year
Buying feed		TJS/year
Setting up the poultry farm		TJS/year
Running the poultry farm (total costs)		TJS/year
Building the poultry farm (cost/by year of use)		TJS/year
Marketing your products		TJS/year
Total expenditures		TJS/year

### INCOME

Income from egg and meat sales per year		Somonis/ year
<b>INCOME-COSTS</b>		<b>Somonis/ year</b>

### Conclusion

Is your business profitable?

How can you make it more profitable?



# Sheet 9

## LIVESTOCK MANAGEMENT AND DISEASE PREVENTION

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### **Avoid mixing different birds that were not raised together:**

It is very difficult to add new birds to a solar poultry farm because once other birds have been established there they tend to fight.

It is also not recommended because of disease transmission risks. However if necessary this can be done after a quarantine period. The best moment to transfer the new animals is at night, when they sleep and are very quiet. If new cocks are brought to a place where there is already one, they will probably fight to the death.

### **Follow strict hygiene rules**

Contagious diseases are the main causes of failure in poultry breeding. Most of the risks can be prevented by strict hygiene rules, including regularly washing and disinfecting the solar poultry farm and its components. Changing water every day is also required.

Other animals should not come inside the poultry shed and the food store: rats, mice, other birds can carry diseases and contaminate chickens.

It is therefore necessary to close all poultry shed and food store openings, including ventilators, with mesh.

Visitors can also carry germs from other poultry farms on the soles of their shoes.

### **Avoid contamination from outside or other poultry farms:**

Before bringing new birds in a poultry shed that has been emptied, it is absolutely necessary to eradicate all germs that can stay in the shed:

- Wash carefully everywhere with water and detergent.
- Disinfect the shed and accessories (with detol solution, phenyl water, or chloride).
- Spray insecticide everywhere.
- Leave shed empty for at least 15 days.

### **Vaccination**

Major vaccinations should be done to chicks, according to veterinary advice. Try and buy chicks that already have the necessary vaccinations.

### **Medical prevention**

Food complements help to prevent some diseases that are due to weaknesses caused by an unbalanced diet. They should be added in drinking water over a 5 day period, once a month.



Examples:

- Mineral supplements,
- Vitamins supplements and Amino Acid supplements.

In case of disease, very special hygiene precautions should be observed:

- Isolate sick animal,
- Consult veterinary service and follow advice,
- Bring dead animal to veterinary laboratory,
- Burn dead animal or bury it far from poultry farm.







#### GERES - TAJIKISTAN

Address: Republic of Tajikistan, Dushanbe, Khamza khakimzoda Str. 79  
Phone: (+992) 37 880 65 64  
E-mail: [tajikistan@geres.eu](mailto:tajikistan@geres.eu)  
Web: [www.geres.eu](http://www.geres.eu)

#### ASDP - AGENCY FOR SUPPORTING OF DEVELOPMENT PROCESSES

Address: Republic of Tajikistan, Khujand, Lenin Str. 20-34  
Phone: (+992 34) 224-53-20; 6-03-62  
E-mail: [office@agency nau.tj](mailto:office@agency nau.tj)  
Web: [www.agency nau.tj](http://www.agency nau.tj)